

## BIBLIOGRAPHY OF ROTATIONAL SPECTRA OF WEAKLY BOUND COMPLEXES

Stewart Novick

Department of Chemistry

Wesleyan University

Middletown, Connecticut 06459

snovick@wesleyan.edu

<http://www.wesleyan.edu/chem/faculty/novick/vdw.pdf>

ABSTRACT. The following bibliography contains references to high resolution experimental studies of weakly bound complexes. The list was originally compiled to include only microwave experiments, but has since grown to include other experiments done to rotational resolution. In addition, some experimentally oriented theoretical calculations have been included. I make no claims of completeness for this bibliography and apologize in advance for the inevitable omissions. I would appreciate learning about any errors and oversights in the compilation. This bibliography is an updated version of a publication of the same name which appeared in "Structure and Dynamics of Weakly Bound Molecular Complexes", ed. A. Weber, pg 201, (Reidel, Dordrecht, 1987). The format of font size 8 allows for one line per reference in most cases. When referencing this bibliography in the literature, please cite: "S. E. Novick, Bibliography of Rotational Spectra of Weakly Bound Complexes, (2012). Electronic updates are available on the web at <http://www.wesleyan.edu/chem/faculty/novick/vdw.pdf>. The "nominally inclusive" date signifies that the bibliography is most reliable up to that publication date. There are more recent entries, but they are only a subset of the literature.

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nominally inclusive up through January 2002

|    |                               |      |     |      |       |                                       |  |   |
|----|-------------------------------|------|-----|------|-------|---------------------------------------|--|---|
| He | He                            | T    | JCP | 111  | 9248  | 1999                                  | T VAN MOURIK, TH DUNNING Jr  |   |
| He | He quantum reflection         | SCI  | 331 | 892  | 2011  | BS ZHAO, G MEIJER, W SCHOLLKOPF       |  |   |
| He | (He) <sub>3</sub>             | T    | JCP | 102  | 7095  | 1995                                  | I ROEGGEN, J ALMLOF  |   |
| He | Ne+                           | CPL  | 314 | 501  | 1999  | J SEONG, KC JANDA, ..., N HALBERSTADT |  |   |
| He | Ar+                           | mw   | JCP | 102  | 2379  | 1995                                  | A CARRINGTON, CA LEACH, AJ MARR, AM SHAW, MR VIANT, JM HUTSON, MM LAW  |   |
| He | Kr+                           | mw   | JCP | 105  | 8602  | 1996                                  | A CARRINGTON, CH PYNE, AM SHAW, SM TAYLOR, JM HUDSON, MM LAW   |   |
| He | Mg                            | T    | JCP | 91   | 1114  | 1989                                  | DJ FUNK, WH BRECKINRIDGE, J SIMONS, G CHALASINSKI  |   |
| He | F <sub>2</sub>                | T    | JCP | 110  | 860   | 1999                                  | KW CHAN, TD POWER, J JAI-NHUKNAN, SM CYBULSKI  |   |
| He | Cl <sub>2</sub>               | E    | JCP | 84   | 1165  | 1986                                  | JJ CLINE, DD EVARD, F THOMMEN, KC JANDA  |   |
| He | Cl <sub>2</sub>               | E    | JCP | 89   | 3535  | 1988                                  | JJ KLINE, BP REID, DD EVARD, N SIVAKUMAR, N HALBERSTADT, KC JANDA  |   |
| He | Cl <sub>2</sub>               | T    | JCP | 102  | 8846  | 1995                                  | SS HUANG, CR BIELER, KC JANDA, F-M TAO, W KLEMPERER, P CASAVECCHIA, GG VOLPI, N HALBERSTADT                                    |   |
| He | Cl <sub>2</sub>               | T    | CP  | 219  | 161   | 1997                                  | BL GRIGORENKO, AV NEMUKHIN, VA APKARIAN  |   |
| He | Cl <sub>2</sub>               | T    | JCP | 108  | 9301  | 1998                                  | FY NAUMKIN, FRW McCOURT  |   |
| He | Cl <sub>2</sub>               | T    | JCP | 110  | 7745  | 1999                                  | SM CYBULSKI, JS HOLT   |   |
| He | Cl <sub>2</sub>               | T    | JCP | 111  | 997   | 1999                                  | J WILLIAMS, A ROHRBACHER, J SEONG, N MARIANAYAGAM, KC JANDA, R BURCL, MM SZCZESNIAK, G CHALASINSKI, SM CYBULSKI, N HALBERSTADT |   |
| He | I <sub>2</sub>                | E    | JCP | 68   | 671   | 1978                                  | RE SMALLEY, L WHARTON, DH LEVY   |   |
| He | ICl                           | LIF  | JCP | 118  | 7233  | 2003                                  | MD BRADKE, RA LOOMIS   |   |
| He | Br                            | T    | JCP | 115  | 10438 | 2001                                  | MP de LARA-CASTELLS, RV KREMS, AA BUCHANCHENKO, G DELGADO-BARRIO, P VILLARREAL   |   |
| He | Br <sub>2</sub>               | E    | JCP | 81   | 5514  | 1984                                  | LJ VAN DE BURGT, J-P NICOLAI, MC HEAVEN  |   |
| He | Br <sub>2</sub>               | E    | JCP | 104  | 3501  | 1996                                  | DG JAHN, WS BARNEY, J CABALO, SG CLEMENT, A ROHRBACHER, TJ SLOTTERBACK, J WILLIAMS, KC JANDA                                   |   |
| He | Br <sub>2</sub>               | T    | JCP | 105  | 7454  | 1996                                  | T GONZALEZ-LEZANA, MI HERNANDEZ, G DELGADO-BARRIO, AA BUCHACHENKO, P VILLARREAL  |   |
| He | Br <sub>2</sub>               | D    | JCP | 106  | 3216  | 1997                                  | T GONZALEZ-LEZANA, MI HERNANDEZ, G DELGADO-BARRIO, P VILLARREAL  |   |
| He | Br <sub>2</sub>               | DT   | JCP | 110  | 256   | 1998                                  | A ROHRBACHER, T RUCHTI, KC JANDA, AA BUCHACHENKO, MI HERNANDEZ, T GONZALEZ-LEZANA, P VILLARREAL, G DELGADO-BARRIO              |   |
| He | Br <sub>2</sub>               | T    | JCP | 115  | 10438 | 2001                                  | MP de LARA-CASTELLS, RV KREMS, AA BUCHANCHENKO, G DELGADO-BARRIO, P VILLARREAL   |   |
| He | ClF far                       | I?   |     |      |       | 1995                                  | S DRUCKER, W KLEMPERER   |   |
| He | ClF                           | mw&T | JCP | 109  | 3048  | 1998                                  | K HIGGINS, FM TAO, W KLEMPERER   |   |
| He | HF                            | T    | COL |      | TE5   | 1991                                  | T SLEE, RJ LE ROY  |   |
| He | HF                            | ID   | JCP | 93   | 5387  | 1990                                  | CM LOVEJOY, DJ NESBITT   |   |
| He | HCl                           | ID   | JCP | 93   | 5387  | 1990                                  | CM LOVEJOY, DJ NESBITT   |   |
| He | CdCH <sub>3</sub>             | E    | COL | FB11 |       | 1991                                  | AM ELLIS, ESJ ROBLES, TA MILLER  |   |
| He | C <sub>5</sub> H <sub>5</sub> | E    | JCP | 97   | 5273  | 1992                                  | L YU, J WILLIAMSON, SC FOSTER, TA MILLER   |   |
| He | CO                            | I?   | JCP | 93   | 18    | 1990                                  | ARW McKELLAR   |   |
| He | CO                            | T &  | IR  | JCP  | 101   | 39                                    | 1994   | CE CHUAQUI, RJ LEROY, ARW McKELLAR          |
| He | CO                            | T    | JCP | 101  | 8680  | 1994                                  | FM TAO, S DRUCKER, RC COHEN, W KLEMPERER   |   |
| He | CO                            | T    | COL | RE06 |       | 1994                                  | FM TAO, S DRUCKER, R COHEN, W KLEMPERER  |   |
| He | CO                            | I    | JCP | 105  | 7910  | 1996                                  | M-C CHAN, ARW McKELLAR   |   |
| He | CO                            | T&I  | JCP | 107  | 9921  | 1997                                  | TGA HEIJMEN, R MOSZYNSKI, PES WORMER, A VAN DER AVVOIRD  |   |
| He | CO                            | T    | JCP | 107  | 9929  | 1997                                  | JP REID, CJSM SIMPSON, HM QUINEY   |   |
| He | CO                            | mw & | I   | JCP  | 110   | 10766                                 | '99  | ARW McKELLAR, Y XU, W JAEGER, C BISSONNETTE |
| He | CO                            | mm   | JCP | 112  | 4064  | 2000                                  | LA SURIN, DA ROTH, I PAK, BS DUMESH, F LEWEN, G WINNEWISSER  |   |
| He | CO                            | T    | MP  | 98   | 1995  | 2000                                  | R KOBAYASHI, RD AMOS, ..., CJSM SIMPSON  |   |
| He | CO                            | T    | MP  | 99   | 689   | 2001                                  | FA GIANTURCO, F PAESANI  |   |
| He | CO                            | T    | JCP | 119  | 131   | 2003                                  | WB ZEIMEN, GC GROENENBOOM, A van der AVOIRD  |   |

|         |               |     |         |      |      |        |      |   |
|---------|---------------|-----|---------|------|------|--------|------|---|
| He      | CO            |     | E       | JCP  | 119  | 141    | 2003 | WB ZEIMEN, GC GROENENBOOM, A van der AVOIRD   |
| He      | CO2           | T & | IR      | JCP  | 101  | 8351   | 1994 | MJ WEIDA, JM SPERHAC, DJ NESBITT, JM HUTSON   |
| He      | CO2           |     | T       | JCP  | 109  | 10284  | '98  | G YAN, M YANG, D XIE  |
| He      | CO2           |     | T       | JCP  | 111  | 6439   | 1999 | F NEGRI, F ANCILOTTO, F TOIGO   |
| He      | CO2           |     | mw      | JMSt | 599  | 211    | 2001 | Y XU, W JAEGER  |
| He      | CO2           |     | T       | JCP  | 115  | 3074   | 2001 | T KORONA, R MOSZYNSKI, F THIBAUT, J-M LAUNAY, B BUSSERY-HONVAULT, PES WORMER            |
| He      | CO2           |     | T       | CPL  | 349  | 335    | 2001 | G MAROULIS, A HASKOPOULOS   |
| He      | OCS           | T & | mw      | JCP  | 110  | 1383   | 1999 | K HIGGINS, W KLEMPERER  |
| He      | OCS           |     | T       | JCP  | 113  | 3011   | 2000 | FA GIANTURCO, F PAESANI   |
| He      | OCS           |     | T       | JCP  | 115  | 5059   | 2001 | JMM HOWSON, JM HUTSON   |
| He      | OCS           |     | I       | JCP  | 125  | 144306 | '06  | Z ABUSARA, L BOVAYEH, N MOAZZEN-AHMADI, ARW McKELLAR                                    |
| He      | OCS           |     | mw      | JMSP |      |        | 2008 | Y XU, W JAEGER  |
| He2     | OCS           |     | mw      | CPL  | 350  | 417    | 2001 | Y XU, W JAEGER  |
| He(2-8) | OCS           |     | Imw     | SCI  | 297  | 2030   | 2002 | J TANG, Y XU, ARW McKELLAR, W JAEGER  |
| He(2-7) | OCS           |     | I       | JCP  | 125  | 144306 | '06  | Z ABUSARA, L BOVAYEH, N MOAZZEN-AHMADI, ARW McKELLAR                                    |
| He n    | OCS           |     | mw      | JCP  | 119  | 5457   | 2003 | Y XU, W JAEGER  |
| He6000  | OCS           |     | Imw     | JCP  | 113  | 9060   | 2000 | S GREBENEV, M HAVENITH, F MADEJA, JP TOENNIES, AF VILESOV                               |
| He n    | OCS H2        |     | Imw     | JCP  | 114  | 617    | 2001 | S GREBENEV, BG SARTAKOV, JP TOENNIES, AF VILESOV  |
| He      | HCN T & mm    |     | wave    | JPC  | 99   | 2646   | 1995 | S DRUCKER, FM TAO, W KLEMPERER  |
| He      | HCN           |     | m       |      |      |        | 1994 | HS GUTOWSKY et al.  |
| He      | HCN           |     | T       | JCP  | 105  | 440    | 1996 | KM ATKINS, JM HUTSON  |
| He      | HCN           |     | T       | JCP  | 114  | 851    | 2001 | RR TOCZYLOWSKI, F SLAWOMIR, M CYBULSKI  |
| He      | HCCH          |     | MBERCOL | RE05 |      |        | 1994 | S DRUCKER, FM TAO, W KLEMPERER  |
| He      | HCCH          |     | I&T     | JCP  | 102  | 8385   | 1995 | R MOSZYNSKI, PES WORMER, A VAN DER AVOIRD   |
| He      | HCCCN         |     | mw      | JCP  | 123  | 064303 | '05  | WC TOPIC, W JAEGER  |
| He      | N2H+          |     | I       | JCP  | 102  | 5570   | 1995 | SA NIZKORODOV, JP MAIER, EJ BIESKE  |
| He      | HCO+          |     | I       | JCP  | 103  | 1297   | 1995 | SA NIZKORODOV, JP MAIER, EJ BIESKE  |
| He      | CH4           |     | T       | CPL  | 227  | 483    | 1997 | D GAO, L CHEN, Z LI, F-M TAO, Y-K PAN   |
| He      | CH4           |     | T       | JCP  | 113  | 6724   | 2000 | R SPECCHIO, A FAMULARI, R MARTINAZZO, M RAIMONDI  |
| He      | C12H12        |     | T&E     | JCP  | 107  | 8781   | 1997 | A BACH, S LEUTWYLER, D SABO, Z BACIC {2,3-dimethylnaphthalene}                          |
| He      | NO            |     | T       | JCP  | 109  | 157    | 1998 | EPF LEE, TG WRIGHT  |
| He      | N2O           |     | mw      | JCP  | 121  | 12308  | '04  | X SONG, Y XU, P-N ROY, W JAEGER   |
| He n    | N2O           |     | mw      | PRL  | 91   | 16301  | '03  | Y XU, W JAEGER, J TANG, ARW McKELLAR  |
| He      | C5H5N         |     | mw      | JCP  | 127  | 034302 | '07  | C TANJAROON, W JAEGER {pyridine}  |
| He      | (CH2)3        |     | T       | JCP  | 115  | 8431   | 2001 | TB PEDERSEN, B FERNANDEZ, H KOCH, J MAKAREWICZ {cyclopropane}                           |
| He      | C10H8         |     | T       | JCPA | 105  | 10379  | '01  | E CLEMENTI, G CORONGIN(?) {naphthalene}   |
| He      | CuF           |     | T       | JCPA | 114  | 4446   | 2010 | CJ EVANS, TG WRIGHT, AM GARDNER {Rg MX; Rg = He, Ne, Ar; M = Cu, Ag, Au; X = F, Cl}     |
| He      | CH3           |     | T       | JCP  | 116  | 1012   | 2002 | O DOPFER, D LOCKHAUS  |
| He      | H2O           |     | T       | JCP  | 116  | 1397   | 2002 | MP HODGES, RJ WHEATLEY, AH HARVEY   |
| He      | H F lifetime  |     | T       | CPL  | 352  | 91     | 2002 | T TAKAYANAGI, A WADA {H He F}   |
| He2     | Cl2           |     | E       | JCP  | 95   | 729    | 1991 | WD SANDS, CR BIELER, KC JANDA   |
| He2     | Cl2           |     | T       | JCP  | 113  | 7252   | 2000 | M HERNANDEZ, N HALBERSTADT, WD SANDS, KC JANDA  |
| He2     | C5H5          |     | E       | JCP  | 97   | 5273   | 1992 | L YU, J WILLIAMSON, SC FOSTER, TA MILLER  |
| He2     | CH3C5H4       |     | E       | JCP  | 97   | 5273   | 1992 | L YU, J WILLIAMSON, SC FOSTER, TA MILLER  |
| He2     | Ne+           |     | T       | JMSt | 440  | 53     | 1998 | Z HUANG, ZH ZHU   |
| Ne      | Ar            |     | mw      | JCP  | 102  | 1181   | 1995 | J-U GRABOW, AS PINE, GT FRASER, FJ LOVAS, RD SUENRAM, T EMILSSON, E ARUNAN, HS GUTOWSKY |
| Ne      | Ar CO2        |     | mw?     | MP   | 93   | 727    | 1998 | Y XU, W JAEGER  |
| Ne      | Ar HCl        |     | mw      | JCP  | 110  | 4354   | 1998 | Y XU, GS ARMSTRONG, W JAEGER  |
| Ne      | Ar N2O        |     | mw      | MP   | 99   | 13     | 2001 | MS NGARI, Y XU, W JAEGER  |
| Ne      | Ar2           |     | T       | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ne      | Ar2           |     | mw      | JCP  | 107  | 4788   | 1997 | Y XU, W JAEGER  |
| Ne      | Ar3           |     | mw      | JCP  | 107  | 4788   | 1997 | Y XU, W JAEGER  |
| Ne2     | Ar            |     | T       | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ne2     | Ar            |     | mw      | JCP  | 107  | 4788   | 1997 | Y XU, W JAEGER  |
| Ne2     | Ar2           |     | mw      | JCP  | 107  | 4788   | 1997 | Y XU, W JAEGER  |
| Ne3     | Ar            |     | mw      | JCP  | 107  | 4788   | 1997 | Y XU, W JAEGER  |
| Ne      | Kr            |     | mw      | JCP  | 103  | 2827   | 1995 | Y XU, W JAEGER, J DJAUHARI, MCL GERRY   |
| Ne2     | Kr            |     | mw      | JCP  | 100  | 4171   | 1994 | Y XU, W JAEGER, MCL GERRY   |
| Ne2     | Kr            |     | T       | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ne      | Xe            |     | mw      | JCP  | 99   | 919    | 1993 | W JAEGER, Y XU, MCL GERRY   |
| Ne2     | Xe            |     | mw      | JCP  | 100  | 4171   | 1994 | Y XU, W JAEGER, MCL GERRY   |
| Ne2     | Xe            |     | T       | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ne      | B             |     | E       | JCP  | 103  | 2779   | 1995 | X YANG, E HWANG, PJ DAGDIGIAN, M YANG, MH ALEXANDER                                     |
| Ne      | H2 scattering |     | &T      | JCP  | 101  | 8800   | 1994 | M FAUBEL, FA GIANTURCO, F RAGNETTI, LY RUSIN, F SONDERMANN, U TAPPE, JP TOENNIES        |
| Ne      | H2            |     | T       | COL  | TL01 |        | 1995 | K CROWELL, RJ LE ROY, ARW McKELLAR  |
| Ne      | HF            |     | T       | JCP  | 91   | 711    | 1989 | SV ONEIL, DJ NESBITT, P ROSMUS, H-J WERNER, DC CLARY                                    |
| Ne      | HF            |     | T       | JC   | 91   | 722    | 1989 | DJ NESBITT, CM LOVEJOY, TG LINDEMAN, SV ONEIL, DC CLARY                                 |
| Ne      | HF            |     | JMSP    |      | 140  | 141    | 1990 | GT FRASER, RD SUENRAM   |
| Ne      | DF            |     | ID      | JCP  | 94   | 208    | 1991 | CM LOVEJOY, DJ NESBITT  |
| Ne      | HF vib freq   |     | MP      |      | 81   | 1225   | 1994 | SAC MCDOWELL, MG TREFRY, AD BUCKINGHAM  |

|       |            |      |       |      |       |      |  |
|-------|------------|------|-------|------|-------|------|--|
| Ne    | HF         | T    | JCP   | 110  | 8338  | 1999 | M MEUWLY, JM HUTSON  |
| Ne    | HF in He   | I    | JCP   | 115  | 4508  | 2001 | K NAUTA, RE MILLER   |
| Ne    | DCI        |      | MP    | 41   | 619   | 1980 | AE BARTON, DJB HOWLETT, BJ HOWARD  |
| Ne    | HCl        |      | MP    | 51   | 1493  | 1984 | EJ CAMPBELL, WG READ   |
| Ne    | DCI        | I    | JCP   | 94   | 5796  | 1991 | MD SCHUDER, DD NELSON Jr, DJ NESBITT   |
| Ne    | HCl        | I    | CPL   | 88   | 147   | 1988 | CM LOVEJOY, DJ NESBITT   |
| Ne    | HCl        | T    | JCP   | 91   | 4448  | 1989 | JM HUTSON  |
| Ne    | HCl        | T    | MP    | 100  | 151   | 2002 | JM HUTSON, BJ HOWARD   |
| Ne    | F2         | T    | JCP   | 110  | 860   | 1999 | KW CHAN, TD POWER, J JAI-NHUKNAN, SM CYBULSKI  |
| Ne    | Cl2        | I    | JCP   | 84   | 3630  | 1986 | DD EVARD, F THOMMEN, KC JANDA  |
| Ne2   | Cl2        |      | Col   |      |       | 1988 | CR BIELER, SR HAIR, KC JANDA   |
| Ne    | Cl2        | T    | JCP   | 87   | 3966  | 1987 | N HALBERSTADT, JA BESWICK, KC JANDA  |
| Ne    | Cl2        | E    | JPC   | 84   | 2004  | 1984 | DE BRINZA, CM WESTERN, DD EVARD  |
| Ne    | Cl2        | E    | JPC   | 91   | 2508  | 1987 | DD EVARD, F THOMMEN, JI CLINE  |
| Ne    | Cl2        | T    | JCP   | 102  | 1944  | 1995 | J-Y FANG, H GUO  |
| Ne    | Cl2        | T    | JCP   | 109  | 1271  | 1998 | FY NAUMKIN, FRW McCOURT  |
| Ne    | Cl2        | T    | JCP   | 110  | 7745  | 1999 | SM CYBULSKI, JS HOLT   |
| Ne    | Br2        | E    | JCP   | 82   | 5295  | 1985 | F THOMMEN, DD EVARD, KC JANDA  |
| Ne    | N2         | T    | JPC   | 93   | 7629  | 1989 | M BERNARDI, FA GIANTURCO   |
| Ne    | N2         | mw T | JCP   | 109  | 5420  | 1998 | W JAEGER, Y XU, G ARMSTRONG, MCL GERRY, FY NAUMKIN, F WANG, FRW McCOURT                            |
| Ne    | NO         | D    | JCP   | 85   | 1418  | 1986 | K SATO, Y ACHIBA, H NAKAMURA, K KIMURA   |
| Ne    | NO         | RTPI | JCP   | 109  | 8940  | 1998 | J FLENIKEN, Y KIM, H MEYER   |
| Ne    | N2O        | I    | JMSp  | 189  | 235   | 1998 | WA HERREBOUT, H-B QIAN, H YAMAGUCHI, BJ HOWARD   |
| Ne    | N2O        | mw   | JMSp  | 192  | 320   | 1998 | MS NGARI, W JAEGER   |
| Ne    | N2O        | T    | CPL   | 351  | 149   | 2002 | H ZHU, D XIE, G YAN  |
| Ne2   | N2O        | mw   | JCP   | 111  | 3919  | 1999 | MS NGARI, W JAEGER   |
| Ne    | Ar N2O     | mw   | MP    | 99   | 13    | 2001 | MS NGARI, Y XU, W JAEGER   |
| Ne    | OCS        | E    | CPL   | 118  | 12    | 1985 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE   |
| Ne    | OCS        | I    | JCP   | 86   | 1670  | 1987 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE   |
| Ne    | OCS        |      | JCP   | 87   | 2010  | 1987 | FJ LOVAS, RD SUENRAM   |
| Ne    | OCS        |      | COL   | FA7  |       | 1991 | L NEMES, SL MARUCA, AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI  |
| Ne    | OCS dipole |      | JMSp  | 160  | 422   | 1993 | AM ANDREWS, L NEMES, SL MARUCA, KW HILLIG II, RL KUCZOWSKI, JS MUENTER                             |
| Ne    | OCS        | mw   | JMSp  | 169  | 181   | 1995 | Y XU, MCL GERRY  |
| Ne    | OCS        | T    | CPL   | 275  | 494   | 1997 | G YAN, M YANG, D XIE   |
| Ne2   | OCS        | mw   | PCCP  | 2    | 3549  | 2000 | Y XU, W JAEGER   |
| Ne    | ICl        | E    | JCP   | 94   | 4171  | 1991 | TA STEPHENSON, Y HONG, MI LESTER   |
| Ne    | CO2        |      | JCP   | 88   | 6157  | 1988 | GT FRASER, AS PINE, RD SUENRAM   |
| Ne    | CO2        | I    | JCP   | 89   | 100   | 1988 | AS PINE, GT FRASER   |
| Ne    | CO2        | mw   | JPC   | 97   | 357   | 1993 | M IIDA, Y OHSHIMA, Y ENDO  |
| Ne    | CO2        | mw   | JMSp  | 192  | 435   | 1998 | Y XU, W JAEGER   |
| Ne    | CO2        | T    | JCP   | 111  | 6439  | 1999 | F NEGRI, F ANCILOTTO, F TOIGO  |
| Ne    | BF3        | IM   | JCP   | 90   | 7017  | 1989 | Y MATSUMOTO, Y OHSHIMA, M TAKAMI, K KUCHITSU   |
| Ne    | PF3        | M    | CPL   | 171  | 542   | 1990 | KW HILLIG II, MS LABARGE, A TALEB-BENDIAB, RL KUCZOWSKI  |
| Ne    | C2H4       | T    | JCP   | 91   | 1079  | 1989 | AR TILLER, AC PEET, DC CLARY   |
| Ne    | C2H4       | mw   | JCP   | 119  | 8448  | 2003 | Y LU, W JAEGER   |
| Ne    | HCCH       | IT   | JCP   | 109  | 8968  | 1998 | RJ BEMISH, L OUDEJANS, RE MILLER, R MOSZYNSKI, TGA HEIJMEN, T KORONA, PES WORMER, A VAN DER AVOIRD |
| Ne    | HCCH       | mw   | PCCP  | 5    | 1774  | 2003 | Y LIU, W JAEGER  |
| Ne    | CH         | E    | FDSCS | 97   | 351   | 1994 | WH BASINGER, U SCHNUPF, MC HEAVEN  |
| Ne    | CH         | E    | JCP   | 103  | 7218  | 1995 | WH BASINGER, WG LAWRENCE, MC HEAVEN  |
| Ne    | OH         | E    | COL   | WH07 |       | 1993 | BC CHANG, JM WILLIAMSON, JR DUNLAP, TA MILLER  |
| Ne    | OH         | E    | COL   | 93   | RE07  | 1993 | BC CHANG, JM WILLIAMSON, TA MILLER   |
| Ne    | OH         | E    | JPC   | 94   | 1720  | 1990 | Y LIN, SK KULKARNI, MC HEAVEN  |
| Ne    | OH         | E    | Col   |      |       | 1990 | Y LIN, SK KULKARNI, MC HEAVEN  |
| Ne    | OH         | T    | JCP   | 94   | 7602  | 1991 | ML DUBERNET, D FLOWER, JM HUTSON   |
| Ne    | OH         | COL  | ME5   |      |       | 1991 | S FEI, X ZHENG, Y LIN, MC HEAVEN   |
| Ne    | OH         | E    | JCP   | 96   | 3476  | 1992 | BC CHANG, DW CULLIN, JM WILLIAMSON, JR DUNLOP, BD REHFUSS, TA MILLER                               |
| Ne    | OH         | COL  |       | 92   | RE08  | 1992 | BC CHANG, JM WILLIAMSON, JR DUNLOP, TM CERNY, TA MILLER  |
| Ne    | OH         | T    | JCP   | 103  | 3400  | 1995 | M YANG, MH ALEXANDER   |
| Ne    | OH         | ED   | JCP   | 103  | 3418  | 1995 | CC CHUANG, PM ANDREWS, MI LESTER   |
| Ne2   | OH         | E    | COL   | 92   | RE10  | 1992 | JR DUNLOP, BC CHANG, JW WILLIAMSON, TM CERNY, TA MILLER  |
| Ne1-4 | OH         | T    | JCP   | 114  | 10278 | '01  | H-S LEE, AB McCOY  |
| Ne    | H2O+       | I    | JCP   | 114  | 7081  | 2001 | O DOPFER, D ROTH, JP MAIER   |
| Ne    | SH         | E    | JCP   | 107  | 3437  | 1997 | MC YANG, CC CARTER, TA MILLER  |
| Ne    | SH         | E    | JCP   | 107  | 3447  | 1997 | CC CARTER, TA MILLER   |
| Ne    | SH         | E    | JCP   | 110  | 5065  | 1999 | CC CARTER, TA MILLER, H-S LEE, AB McCOY, EF HAYES  |
| Ne    | SH         | mw   | JCP   | 120  | 6935  | 2004 | K SUMA, Y SUMIYOSHI, Y ENDO  |
| Ne    | CN         | E    | Col   |      |       | 1990 | Y LIN, SK KULKARNI, MC HEAVEN  |
| Ne    | CN         | E    | COL   | 92   | RE12  | 1992 | S FEI, MC HEAVEN   |
| Ne    | CN         | E    | JCP   | 107  | 7163  | 1997 | WG LAWRENCE, Y CHEN, MC HEAVEN   |
| Ne    | HCN        |      | JCP   | 98   | 6801  | 1993 | HS GUTOWSKY, JD KEEN, TC GERMANN, T EMILSSON, JD AUGSPURGER, CE DYKSTRA                            |
| Ne    | HCN        | T    | JCP   | 114  | 764   | 2001 | G MURDACHAEW, AJ MISQUITTA, R BUKOWSKI, K SZALEWICZ  |

|     |                |     |      |      |        |      |   |
|-----|----------------|-----|------|------|--------|------|---|
| Ne  | HCN            | T   | JCP  | 114  | 851    | 2001 | RR TOCZYLOWSKI, F SLAWOMIR, M CYBULSKI  |
| Ne  | C5H5           | E   | JCP  | 97   | 5273   | 1992 | L YU, J WILLIAMSON, SC FOSTER, TA MILLER  |
| Ne  | CdCH3          | E   | COL  | FB11 |        | 1991 | AM ELLIS, ESJ ROBLES, TA MILLER   |
| Ne  | CO             | I   | MP   | 79   | 1113   | 1993 | RW RANDALL, AJ CLIFFE, BJ HOWARD, ARW McKELLAR  |
| Ne  | CO             | mw  | JCP  | 106  | 7519   | 1997 | KA WALKER, T OGATA, W JAEGER, MCL GERRY, I OZIER  |
| Ne  | CO             | I   | MP   | 93   | 253    | 1998 | ARW McKELLAR, M-C CHAN  |
| Ne  | CO             | mm  | JMSp | 192  | 243    | 1998 | G WINNEWISSER, BS DUMESH, ..., FS RUSIN   |
| Ne  | CO             | T   | JCP  | 110  | 11734  | '99  | GC McBANE, SM CYBULSKI  |
| Ne  | CO             | T   | CPL  | 307  | 287    | 1999 | V SUBRAMANIAN, K CHITRA, ..., S SANKAN  |
| Ne  | CO             | mm  | JMSp | 230  | 149    | 2005 | LA SURIN, VA POTAPOV, BS DUMESH, G WINNEWISSER  |
| Ne  | CS2            | I   |      |      |        | 1993 | TR DYKE, J CRUZAN, M WALSH  |
| Ne  | SO2            | I   |      |      |        | 1993 | TR DYKE, CA HWANG   |
| Ne  | C6H6           | m   | JCP  | 101  | 9736   | 1994 | TH BRUPBACHER, J MAKAREWICZ, A BAUDER   |
| Ne  | C6H6           | T   | JCP  | 101  | 9747   | 1994 | W KLOPPER, HP LUTHI, TH BRUPBACHER, A BAUDER  |
| Ne  | C6H6           | mw  | JCP  | 101  | 861    | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ne  | C6H6 H2O       | mw  | JCP  | 99   | 6208   | 1993 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ne  | C6H6 H2O       | mw  | JCP  | 101  | 861    | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ne  | CH4            | T   | CPL  | 227  | 483    | 1997 | D GAO, L CHEN, Z LI, F-M TAO, Y-K PAN   |
| Ne  | CH4            | I   | CJP  | 79   | 423    | 2001 | M WANGLER, DA ROTH, G WINNEWISSER, I PAK, ARW McKELLAR  |
| Ne  | CH4 CH4        | mw  |      |      |        | 1994 | J GRABOW, RD SUENRAM, FJ LOVAS  |
| Ne  | SiH4           | I   | JCP  | 104  | 5391   | 1996 | MD BROOKES, DJ HUGHES, BJ HOWARD  |
| Ne  | SiH4           | I   | JCP  | 107  | 2738   | 1997 | MD BROOKES, DJ HUGHES, BJ HOWARD  |
| Ne  | HCO+           | I   | JCP  | 105  | 1770   | 1996 | SA NIZKORODOV, O DOPFER, M MEUWLY, JP MAIER   |
| Ne  | (CH2)3         | mw  | JCP  | 106  | 7968   | 1997 | Y XU, W JAEGER {cyclopropane}   |
| Ne  | (CH2)3         | T   | JCP  | 115  | 8431   | 2001 | TB PEDERSEN, B FERNANDEZ, H KOCH, J MAKAREWICZ {cyclopropane}   |
| Ne  | CH3CH2CH3      | mw  | JCP  | 127  | 184306 | '07  | KI PETERSON, D PULLMAN, W LIN, AJ MINEL, SE NOVICK {propane}  |
| Ne  | C6H4(CHCH2)F   | E   | JCP  | 108  | 1836   | 1998 | NM LAKIN, G PIETRAPERZIA, M BECUCCI, E CASTELLIUCCI, M CORENO, A GIARDINI-GUIDONI, A VAN DER AVOIRD {4-fluorostyrene} |
| Ne  | C6H5NH2        | E   | CPL  | 260  | 87     | 1996 | M BECUCCI, G PIETRAPERZIA, NM LAKIN, E CASTELLIUCCI, P BRECHIGNAC {aniline}   |
| Ne  | C6H5NH2        | mw  | CP   | 228  | 301    | 1998 | D CONSALVO, V STORM, ..., H DREIZLER  |
| Ne  | C6H5NH2        | mw  | CP   | 237  | 395    | 1998 | V STORM, H DREIZLER, ..., D CONSALVO  |
| Ne  | C6H5NH2 v pred | E   | JCP  | 110  | 9961   | 1999 | M BECUCCI, NM LAKIN, G PIETRAPERZIA, E CASTELLIUCCI, Ph BRECHIGNAC, B COUTANT, P HERMINE                              |
| Ne  | C6H5F          | mw  | JPCA | 102  | 10630  | '98  | RJ WILSON, SA PEEBLES, S ANTOLINEZ, ME SANZ, RL KUCZKOWSKI  |
| Ne  | C6H5Cl         | mw  | JMSt | 599  | 15     | 2001 | J-J OH, I PARK, SA PEEBLES, RL KUCZKOWSKI   |
| Ne  | H2S            | T   | JCP  | 110  | 289    | 1999 | G de OLIVEIRA, CE DYKSTRA   |
| Ne  | H2S            | mw  | MP   | 100  | 611    | 2002 | Y LIU, W JAEGER   |
| Ne  | c-C5H5N        | mw  | CC   |      | 2625   | 1998 | A MARIS, W CAMINATI, PG FAVERO {pyridine}   |
| Ne  | c-C5H5N        | mw  | JMSp |      |        | 2008 | B VELINO, W CAMINATI {pyridine}   |
| Ne  | c-(CHCH2)2O    | mm  | JCP  | 110  | 8976   | 1999 | A MARIS, PG FAVERO, A DELL'ERBA, W CAMINATI {2,5-dihydrofuran}  |
| Ne  | c-(CH)3NCHN    | CEJ | 5    | 811  | 1999   |      | W CAMINATI, PG FAVERO {pyrimidine}  |
| Ne  | c-(CH)4NN      | mw  | PCC  | 3    |        | 2000 | W CAMINATI, S MELANDRI, A DELL'ERBA, PG FAVERO {pyridazine}   |
| Ne  | c-C4H7CN       | mw  |      |      |        | 2010 | WC PRINGLE, DJ FROHMAN, W NDUGIRE, SE NOVICK {cyanocyclobutane}   |
| Ne  | CH3(CHCH2O)    | mw  | PCCP | 5    | 1359   | 2003 | S BLANCO, S MELANDRI, A MARIS, W CAMINATI, B VELINO, Z KISIEL {propylene oxide}                                       |
| Ne  | Mg             | T   | JCP  | 110  | 8443   | 1999 | AWK LEUNG, RR JULIAN, WH BRECKENRIDGE   |
| Ne  | Mg+            | D   | JCP  | 110  | 9948   | 1999 | JE REDDIC, MA DUNCAN  |
| Ne  | CH2CF2         | mw  | JCP  | 112  | 2204   | 2000 | A DELL'ERBA, S MELANDRI, A MILLEMAGGI, W CAMINATI, PG FAVERO  |
| Ne  | NH3            | mw  | JCP  | 115  | 6504   | 2001 | J van WIJNGAARDEN, W JAEGER   |
| Ne  | C10H8          | T   | JCPA | 105  | 10379  | '01  | E CLEMENTI, G CORONGIN(?) {naphthalene}   |
| Ne2 | NH3            | mw  | CP   | 283  | 29     | 2002 | J van WIJNGAARDEN, W JAEGER   |
| Ne3 | NH3            | mw  | JACS | 125  | 14631  | '03  | J van WIJNGAARDEN, W JAEGER   |
| Ne  | C28H18         | RCS | JCP  | 113  | 11109  | '00  | T FUJIWARA, Y FUJIMURA, O KAJIMOTO {9-9'-bianthryl}   |
| Ne  | CH3OCH3        | JCP | 118  | 1649 | 2003   |      | A MARIS, W CAMINATI   |
| Ne  | CH3OCH3        | Tmw | JCP  | 124  | 094301 | '06  | Y MORITA, N OHASHI, Y KAWASHIMA, E HIROTA   |
| Ne  | (CH3)2O        | JCP | 118  | 1649 | 2003   |      | A MARIS, W CAMINATI   |
| Ne  | (CH3)2S        | mw  | JPCA | 110  | 7080   | 2006 | SA PEEBLES, RA PEEBLES, Y TATAMITANI, Y KAWASHIMA   |
| Ne  | HCCCN          | mw  |      |      |        | 2005 | A HUCKAUF, W JAEGER (unpublished)   |
| Ne  | HCCCN          | T   | JCP  | 122  | 174312 | '05  | Y ZHOU, D XIE   |
| Ar  | Ar2            | T   | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ar  | Ar2            | T   | JCP  | 110  | 902    | 1999 | NJ WRIGHT, JM HUTSON  |
| Ar  | Kr             | mw  | JCP  | 103  | 2827   | 1995 | Y XU, W JAEGER, J DJAUHARI, MCL GERRY   |
| Ar2 | Kr             | T   | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ar  | Xe             | mw  | JCP  | 99   | 919    | 1993 | W JAEGER, Y XU, MCL GERRY   |
| Ar2 | Xe             | T   | JCP  | 103  | 3386   | 1995 | A ERNESTI, JM HUTSON  |
| Ar  | Mg             | T   | JCP  | 91   | 1114   | 1989 | DJ FUNK, WH BRECKENRIDGE, J SIMONS, G CHALASINSKI   |
| Ar  | Mg             | E   | JCP  | 104  | 7784   | 1996 | S MASSICK, WH BRECKENRIDGE  |
| Ar  | Hg             | E   | JCP  | 103  | 9589   | 1995 | L KRIM, B SOEP, JP VISTICOT   |
| Ar  | Hg             | E   | JCP  | 104  | 7860   | 1996 | SJ LAWRENCE, DN STACEY, IM BELL, K BURNETT  |
| Ar  | Hg             | E   | JCP  | 108  | 8110   | 1998 | K AMANO, K OHMORI, T KUROSAWA, H CHIBA, M OKUNISHI, K UEDA, Y SATO, AZ DEVDARIANI, EE NIKITIN                         |
| Ar  | Ag             | E   | JCP  | 103  | 9200   | 1995 | LR BROCK, MA DUNCAN   |
| Ar  | Ni             | E   | CPL  | 298  | 222    | 1998 | Y KAWAMOTO, K HONMA   |
| Ar  | B              | ET  | JCP  | 98   | 8484   | 1993 | E HWANG, YLHUANG, PJ DAGDIGIAN, MH ALEXANDER  |

|      |                       |                 |       |     |      |       |  |  |
|------|-----------------------|-----------------|-------|-----|------|-------|--|--|
| Ar   | B                     | E               | CPL   | 223 | 483  | 1995  | E HWANG, PJ DAGDIGIAN  |  |
| Ar   | B                     | ET              | JCP   | 106 | 6320 | 1997  | MM ALEXANDER, AR WALTON, M YANG, X YANG, E HWANG, PJ DAGDIGIAN         |  |
| Ar2  | B                     | ET              | JCP   | 106 | 6320 | 1997  | MM ALEXANDER, AR WALTON, M YANG, X YANG, E HWANG, PJ DAGDIGIAN         |  |
| Ar   | HF                    |                 | JCP   | 60  | 3208 | 1974  | SJ HARRIS, SE NOVICK, W KLEMPERER                                      |  |
| Ar   | DF                    |                 | JCP   | 74  | 2133 | 1981  | MR KEENAN, LW BUXTON, EJ CAMPBELL, AC LEGON, WH FLYGARE                |  |
| Ar   | HF                    |                 | JCP   | 74  | 6539 | 1981  | TA DIXON, CH JOYNER, FA BAIOCCHI, W KLEMPERER                          |  |
| Ar   | HF                    | Zeeman          | PRL   | 49  | 1146 | 1983  | WG READ, EJ CAMPBELL   |  |
| Ar   | DF                    | Zeeman          | JCP   | 78  | 6490 | 1983  | EJ CAMPBELL, WG READ   |  |
| Ar   | HF                    |                 | JCP   | 88  | 5142 | 1984  | BL COUSINS, SC OBRIEN, JM LISY   |  |
| Ar   | HF                    |                 | I     | JCP | 85   | 4890  | 1986   | CM LOVEJOY, MD SCHUDER, DJ NESBITT   |
| Ar   | HF                    |                 | I     | JCP | 85   | 2502  | 1986   | GT FRASER, AS PINE   |
| Ar   | HF                    |                 | I     | JCP | 85   | 6905  | 1986   | ZS HUANG, KW JUCKS, RE MILLER  |
| Ar   | HF                    |                 | T     | MP  | 45   | 791   | 1982   | JM HUTSON, BJ HOWARD   |
| Ar   | HF                    |                 | I     | JCP | 91   | 2790  | 1989   | CM LOVEJOY, DJ NESBITT   |
| Ar   | HF                    |                 | T     | JCP | 96   | 6752  | 1992   | JM HUTSON  |
| Ar   | HF                    |                 | I     | JCP | 97   | 7967  | 1992   | JT FARRELL Jr, O SNEH, A MCLLROY, AEW KNIGHT, DJ NESBITT                                     |
| Ar   | HF                    |                 | T     | JCP | 97   | 8009  | 1992   | CM LOVEJOY, JM HUTSON, DJ NESBITT  |
| Ar   | HF                    |                 | nearI | JCP | 98   | 2497  | 1993   | HC CHANG, W KLEMPERER  |
| Ar   | HF                    | constants       | JCP   | 98  | 4307 | 1993  | PA STOCKMAN, GA BLAKE  |  |
| Ar   | HF                    | nearI&T         | JCP   | 99  | 9337 | 1993  | HC CHANG, FM TAO, W KLEMPERER, C HEALY, JM HUTSON                      |  |
| Ar   | HF                    | vib freq shifts | MP    | 81  | 1225 | 1994  | SAC MCDOWELL, MG TREFRY, AD BUCKINGHAM                                 |  |
| Ar   | HF                    |                 | I     | CPL | 226  | 317   | 1994   | PA BLOCK, RE MILLER  |
| Ar   | HF                    |                 | T     | JCP | 101  | 1129  | 1994   | FM TAO, W KLEMPERER  |
| Ar   | DF                    |                 | I     | JCP | 103  | 2395  | 1995   | JT FARRELL Jr, S DAVIS, DJ NESBITT   |
| Ar   | HF                    |                 | T     | JCP | 103  | 6076  | 1995   | VF LOTRICH, HL WILLIAMS, K SZALEWICZ, B JEZIORSKI, R MOSZYNSKI, PES WORMER, A VAN DER AVOIRD |
| Ar   | DF vib prediss        |                 | I     | CPL | 246  | 157   | 1996   | S DAVIS, JT FARRELL Jr, DT ANDERSON, DJ NESBITT  |
| Ar   | DF optothermal        |                 | I     | JCP | 105  | 10410 | 1996   | L OUDEJANS, K NAUTA, RE MILLER   |
| Ar   | HF lifetimes          |                 | I     | JCP | 109  | 8836  | 1998   | C-C CHUANG, SN TSANG, W KLEMPERER, H-C CHANG   |
| Ar   | HF $\nu(\text{HF})=3$ |                 | I     | JCP | 112  | 7022  | 2000   | C-C CHUANG, KJ HIGGINS, HC FU, W KLEMPERER   |
| Ar   | HF                    |                 | T     | JCP | 113  | 2957  | 2000   | M JEZIORSKA, P JANKOWSKI, K SZALEWICZ, B JEZIORSKI   |
| Ar   | HF vib pre            |                 | T     | JCP | 111  | 2470  | 1999   | AA BUCHACHENKO, NF STEPANOV, BL GRIGORENKO, AV NEMUKHIN                                      |
| Ar   | HF in He              |                 | I     | JCP | 115  | 4508  | 2001   | K NAUTA, RE MILLER   |
| Ar2  | HF                    |                 | JCP   | 83  | 4817 | 1985  | HS GUTOWSKY, TD KLOTS, C CHUANG, CA SCHMUTTENMAER, T EMILSSON          |  |
| Ar2  | HF                    |                 | JCP   | 86  | 569  | 1987  | HS GUTOWSKY, TD KLOTS, C CHUANG, CA SCHMUTTENMAER, T EMILSSON          |  |
| Ar2  | HF                    |                 | JCP   | 91  | 63   | 1989  | TD KLOTS, HS GUTOWSKY  |  |
| Ar2  | DF                    |                 | JCP   | 91  | 63   | 1989  | TD KLOTS, HS GUTOWSKY  |  |
| Ar2  | HF                    |                 | T     | JCP | 101  | 10708 | 1995   | SM CYBULSKI, MM SZCZESNIAK, G CHALASINSKI  |
| Ar2  | DF                    |                 | I     | JCP | 103  | 2395  | 1995   | JT FARRELL Jr, S DAVIS, DJ NESBITT   |
| Ar2  | HF                    |                 | I     | JCP | 105  | 9421  | 1996   | JT FARRELL, DJ NESBITT   |
| Ar2  | HF                    |                 | T     | JCP | 106  | 6288  | 1997   | A ERNESTI, JM HUTSON   |
| Ar2  | HF                    |                 | E     | JCP | 107  | 7041  | 1997   | C-C CHUANG, SN TSANG, JG HANSON, W KLEMPERER, H-C CHANG                                      |
| Ar2  | HF                    |                 | T     | JCP | 108  | 4725  | 1998   | VF LOTRICH, P JANKOWSKI, K SZALEWICZ   |
| Ar2  | HF dipole             |                 | mw    | CPL | 333  | 381   | 2001   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI   |
| Ar3  | HF                    |                 | JACS  | 107 | 7174 | 1985  | HS GUTOWSKY, TD KLOTS, C CHUANG, JD KEEN, CA SCHMUTTENMAER, T EMILSSON |  |
| Ar3  | HF                    |                 | JACS  | 109 | 5633 | 1987  | HS GUTOWSKY, TD KLOTS, C CHUANG, JD KEEN, CA SCHMUTTENMAER, T EMILSSON |  |
| Ar3  | DF                    |                 | I     | JCP | 103  | 2395  | 1995   | JT FARRELL Jr, S DAVIS, DJ NESBITT   |
| Ar3  | HF                    |                 | ID    | JCP | 109  | 484   | 1998   | C-C CHUANG, SN TSANG, W KLEMPERER, H-C CHANG   |
| Ar3  | HF dipole             |                 | mw    | CPL | 333  | 381   | 2001   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI   |
| Ar4  | HF                    |                 | JCP   | 88  | 2919 | 1988  | HS GUTOWSKY, C CHUANG, TD KLOTS, T EMILSSON, RS RUOFF, KR KRAUSE       |  |
| Ar n | HF                    |                 | I     | Col |      | 1990  | A MCILROY, R LASCOLA, CM LOVEJOY, DJ NESBITT                           |  |
| Ar n | HF                    |                 | T     | JCP | 100  | 7166  | 1994   | S LIU, Z BACIC, JW MOSKOWITZ, KE SCHMIDT   |
| Ar n | HF                    |                 | T     | JCP | 103  | 1829  | 1995   | S LIU, Z BACIC, JW MOSKOWITZ, KE SCHMIDT   |
| Ar n | HF                    |                 | D     | JCP | 103  | 9228  | 1995   | T SCHRODER, R SCHINKE, S LIU, Z BACIC, JW MOSKOWITZ  |
| Ar n | HF                    |                 | T     | JCP | 104  | 5510  | 1996   | BL GRIGORENKO, AV NEMUKHIN, VA APKARIAN  |
| Ar n | HF                    |                 | T     | JCP | 108  | 6619  | 1998   | CE DYKSTRA   |
| Ar n | HF                    |                 | T     | JCP | 111  | 8378  | 1999   | JM HUTSON, S LIU, JW MOSKOWITZ, Z BACIC  |
| Ar n | HF red shift          |                 | T     | JCP | 114  | 4533  | 2001   | E CUROTTO  |
| Ar   | HCl                   |                 | JCP   | 59  | 2273 | 1973  | SE NOVICK, P DAVIES, SJ HARRIS, W KLEMPERER                            |  |
| Ar   | HCl                   |                 | JCP   | 65  | 1114 | 1976  | SE NOVICK, KC JANDA, SL HOLMGREN, M WALDMAN, W KLEMPERER               |  |
| Ar   | HCl                   |                 | I     | JCP | 66   | 1826  | 1977   | EW BOOM, D FRENKEL, J VAN DER ELSKEN   |
| Ar   | HCl                   |                 | T     | JCP | 74   | 6520  | 1981   | JM HUTSON, BJ HOWARD   |
| Ar   | HCl                   | Zeeman          | JCP   | 78  | 6490 | 1983  | EJ CAMPBELL, WG READ   |  |
| Ar   | HCl                   |                 | I     | JCP | 84   | 1171  | 1986   | D RAY, RL ROBINSON, D GWO, RJ SAYKALLY   |
| Ar   | HCl                   |                 | I     | JCP | 89   | 1268  | 1988   | KL BUSAROW, GA BLAKE, KB LAUGHLIN, RC COHEN, YT LEE, RJ SAYKALLY                             |
| Ar   | HCl                   |                 | I     | CPL | 122  | 1     | 1985   | BJ HOWARD, AS PINE   |
| Ar   | HCl                   |                 | I     | JCP | 83   | 4924  | 1985   | MD MARSHALL, A CHARO, HO LEUNG, W KLEMPERER  |
| Ar   | HCl                   |                 | T     | MP  | 41   | 1123  | 1980   | JM HUTSON, BJ HOWARD   |
| Ar   | HCl                   |                 | T     | MP  | 43   | 493   | 1981   | JM HUTSON, BJ HOWARD   |
| Ar   | HCl                   |                 | T     | MP  | 45   | 769   | 1982   | JM HUTSON, BJ HOWARD   |
| Ar   | HCl                   |                 | T     | JCP | 78   | 4025  | 1983   | CJ ASHTON, MS CHILD, JM HUTSON   |
| Ar   | HCl                   |                 | T     | JCP | 81   | 2357  | 1984   | JM HUTSON  |

|      |                  |       |      |      |       |  |   |
|------|------------------|-------|------|------|-------|--|---|
| Ar   | HCl              | T     | FT2  | 82   | 1163  | 1986   | JM HUTSON   |
| Ar   | HCl              | T     | JCP  | 89   | 4550  | 1988   | JM HUTSON   |
| Ar   | HCl              | T     | MP   | 100  | 151   | 2002   | JM HUTSON, BJ HOWARD  |
| Ar   | HCl              | T     | JCP  | 80   | 4630  | 1984   | LS BERNSTEIN, J WORMHOUDT   |
| Ar   | HCl              | I     | CPL  | 146  | 582   | 1988   | CM LOVEJOY, DJ NESBITT  |
| Ar   | HCl              | I     | CPL  | 149  | 122   | 1988   | CM LOVEJOY, DJ NESBITT  |
| Ar   | HCl              | I     | FDCS | 86   | 13    | 1988   | DJ NESBITT, CM LOVEJOY  |
| Ar   | HCl              | JCP   | 94   | 86   | 1991  | C CHUANG, HS GUTOWSKY  |   |
| Ar   | DCI              | I     | JCP  | 94   | 5796  | 1991   | MD SCHUDER, DD NELSON Jr, DJ NESBITT  |
| Ar   | HCl              | T     | JCP  | 94   | 6677  | 1991   | G CHALASINSKI, MM SZCZESNIAK, B KUKAWSKI-TARNAWSKA                                |
| Ar   | DCI              | I     | JMSp | 152  | 252   | 1992   | SW REEVE, MA DVORAK, WA BURNS, A GRUSHOW, KR LEOPOLD                              |
| Ar   | HCl vib excited  | CPL   | 198  | 347  | 1992  | JW BEVAN, AC LEGON, CA REGO, J ROACH   |   |
| Ar   | HCl vib excited  | CPL   | 204  | 551  | 1993  | JW BEVAN, AC LEGON, CA REGO  |   |
| Ar   | HCl dipole far I | JCP   | 99   | 3200 | 1993  | AL COOKSY, MJ ELROD, RJ SAYKALLY, W KLEMPERER                                |   |
| Ar   | HCl              | T     | JCP  | 100  | 4188  | 1994   | HW JANG, SE CHOI, JC LIGHT  |
| Ar   | DCI              | MP    | 79   | 245  | 1993  | MJ ELROD, BC HOST, DW STEYERT, RJ SAYKALLY                                   |   |
| Ar   | HCl              | T     | JCP  | 103  | 1498  | 1995   | R BURCL, G CHALASINSKI, R BUKOWSKI, MM SZCZESNIAK                                 |
| Ar   | HCl optothermal  | I     | JCP  | 105  | 10410 | 1996   | L OUDEJANS, K NAUTA, RE MILLER  |
| Ar   | HCl              | D     | JCP  | 108  | 5755  | 1998   | A GARCIA-VELA   |
| Ar   | HCl              | mw    | CPL  | 291  | 190   | 1998   | Z KISIEL, L PSZCZOLKOWSKI {36Ar & improved const. for 40Ar}                       |
| Ar   | HCl              | T     | JCP  | 109  | 2233  | 1998   | DE WOON, KA PETERSON, TH DUNNING Jr   |
| Ar   | HCl photodiss    | T     | JCP  | 111  | 2606  | 1999   | JC JUANES-MARCOS, A GARCIA-VELA   |
| Ar   | HCl              | T     | JCP  | 115  | 8899  | 2001   | JM GEREMIA, H RABITZ  |
| Ar   | HCl              | E     | JPCA | 106  | 236   | 2002   | JC JUANES-MARCOS, A GARCIA-VELA   |
| Ar2  | HCl              | JCP   | 86   | 5315 | 1987  | TD KLOTS, C CHUANG, RS RUOFF, T EMILSSON, HS GUTOWSKY                        |   |
| Ar2  | DCI              | JCP   | 91   | 63   | 1989  | TD KLOTS, HS GUTOWSKY  |   |
| Ar2  | HCl              | JCP   | 91   | 63   | 1989  | TD KLOTS, HS GUTOWSKY  |   |
| Ar2  | HCl              | I     | JCP  | 94   | 58    | 1991   | MJ ELROD, DW STEYERT, RJ SAYKALLY   |
| Ar2  | HCl              | I     | JCP  | 95   | 3182  | 1991   | MJ ELROD, DW STEYERT, RJ SAYKALLY   |
| Ar2  | HCl              | T     | JCP  | 98   | 5337  | 1993   | AR COOPER, JM HUTSON  |
| Ar2  | HCl              | I     | JCP  | 98   | 5352  | 1993   | MJ ELROD, JG LOESER, RJ SAYKALLY  |
| Ar2  | HCl              | I     | COL  | 93   | TD06  | 1993   | MJ ELROD, DW STEYERT, JG LOESER, RJ SAYKALLY, AR COOPER, JM HUTSON                |
| Ar2  | HCl              | T     | JCP  | 101  | 10708 | 1995   | SM CYBULSKI, MM SZCZESNIAK, G CHALASINSKI   |
| Ar2  | HCl              | T     | JCP  | 106  | 6288  | 1997   | A ERNESTI, JM HUTSON  |
| Ar2  | HCl dipole       | mw    | CPL  | 333  | 381   | 2001   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI  |
| Ar3  | HCl              | JCP   | 87   | 4383 | 1987  | TD KLOTS, RS RUOFF, C CHUANG, T EMILSSON, HS GUTOWSKY                        |   |
| Ar3  | DCI              | JCP   | 91   | 63   | 1989  | TD KLOTS, HS GUTOWSKY  |   |
| Ar3  | HCl dipole       | mw    | CPL  | 333  | 381   | 2001   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI  |
| Ar n | HCl n=1,2,3      | I     | JCP  | 107  | 1115  | 1997   | DT ANDERSON, S DAVIS, DJ NESBITT  |
| Ar   | HBr              | MP    | 39   | 817  | 1980  | KC JACKSON, PRR LANGRIDGE-SMITH, BJ HOWARD                                   |   |
| Ar   | HBr              | JCP   | 72   | 3070 | 1980  | MR KEENAN, EJ CAMPBELL, TJ BALLE, LW BUXTON, TK MINTON, PD SOPER, WH FLYGARE |   |
| Ar   | HBr              | JCP   | 79   | 1669 | 1983  | WG READ, EJ CAMPBELL   |   |
| Ar   | HBr              | T     | JCP  | 91   | 4455  | 1989   | JM HUTSON   |
| Ar   | HBr              | I     | CPL  | 168  | 161   | 1990   | DW FIRTH, MA DVORAK, SW REEVE, RS FORD, KR LEOPOLD                                |
| Ar   | HBr              | COL   | TE2  |      | 1991  | SW REEVE, MA DVORAK, KR LEOPOLD, DW FIRTH                                    |   |
| Ar   | HBr              | I     | CPL  | 265  | 209   | 1997   | J HAN, AL MCINTOSH, Z WANG, RR LUCCHESI, JW BEVAN                                 |
| Ar   | HBr              | T     | JCP  | 115  | 899   | 2001   | J CASTILLO-CARA, RR LUCCHESI, JW BEVAN  |
| Ar   | HBr              | mm    | JCP  | 119  | 10687 | '03  | BA McELMURRY, RR LUCCHESI, JW BEVAN, II LEONOV, SP BELOV, AC LEGON                |
| Ar2  | HBr dipole       | mw    | CPL  | 333  | 381   | 2001   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI  |
| Ar2  | HBr              | mw    | JCP  | 117  | 8248  | 2002   | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI  |
| Ar   | HI               | mwI   | JCP  | 111  | 5764  | 1999   | A MCINTOSH, Z WANG, J CASTILLO-CHARA, RR LUCCHESI, JW BEVAN, RD SUENRAM, AC LEGON |
| Ar   | HI               | T     | JCP  | 120  | 6471  | 2004   | R PROSMITI, S LOPEZ-LOPEZ, A GARCIA-VELA  |
| Ar   | HI               | mm    | PCCP | 6    | 5318  | 2004   | BA McELMURRY, RR LUCCHESI, JW BEVAN, SP BELOV                                     |
| Ar   | C2               | T     | JCP  | 107  | 1185  | 1997   | FY NAUMKIN, FRW MCCOURT   |
| Ar   | BF3              | JACS  | 100  | 8074 | 1978  | KC JANDA, LS BERNSTEIN, JM STEED, SE NOVICK, W KLEMPERER                     |   |
| Ar   | BF3              | IM    | JCP  | 90   | 7017  | 1989   | Y MATSUMOTO, Y OHSHIMA, M TAKAMI, K KUCHITSU                                      |
| Ar   | HCCH rf Stark    | JCP   | 72   | 6020 | 1980  | RL DELEON, JS MUENTER  |   |
| Ar   | HCCH             | mw    | CPL  | 161  | 202   | 1989   | Y OHSHIMA, M IIDA, Y ENDO   |
| Ar   | HCCH             | I     | JMSp | 153  | 486   | 1992   | TA HU, DG PRICHARD, LH SUN, JS MUENTER, BJ HOWARD                                 |
| Ar   | HCCH             | T     | JPC  | 95   | 3519  | 1991   | CR LE SUEYR, AJ STONE, PW FOWLER  |
| Ar   | HCCH             | I     | JMSp | 153  | 486   | 1992   | TA HU, DG PRICHARD, LH SUN, JS MUENTER, BJ HOWARD                                 |
| Ar   | HCCH             | pot T | CPL  |      | 1981  | 1992   | AE THORNLEY, JM HUTSON  |
| Ar   | HCCH             | I     | JCP  | 99   | 8385  | 1993   | Y OHSHIMA, Y MATSUMOTO, M TAKAMI, K KUCHITSU                                      |
| Ar   | HCCH             | E     | JCP  | 103  | 2850  | 1995   | SS JU, PY CHENG, MY HAHN, HL DAI  |
| Ar   | HCCH             | T     | JPC  | 98   | 3126  | 1994   | RGA BONE  |
| Ar   | HCCH             | T     | JCP  | 101  | 8784  | 1994   | M YANG, RO WATTS  |
| Ar   | HCCH             | T     | JCP  | 102  | 7289  | 1995   | FM TAO, S DRUCKER, W KLEMPERER  |
| Ar   | HCCH             | IE    | CPL  | 250  | 95    | 1996   | AP MILCE, DE HEARD, RE MILLER, BJ ORR   |
| Ar   | HCCH             | T     | JCP  | 95   | 10462 | 1996   | M YANG, MH ALEXANDER, H-J WERNER, RJ BEMISH                                       |
| Ar   | HCCH             | T     | JMSp | 436  | 387   | 1998   | RD HASSE, MW SEVERSON, MM SZCZESNIAK, G CHALASINSKI, P CIEPLAK, et al             |
| Ar   | DCCH             | I     | CPL  | 281  | 272   | 1997   | RJ BEMISH, RE MILLER  |
| Ar   | HCCH             | mw    | JMSp | 205  | 177   | 2001   | Y LIU, W JAEGER   |

|                 |                                     |         |      |     |       |      |   |
|-----------------|-------------------------------------|---------|------|-----|-------|------|---|
| Ar              | HCCCCH                              | I       | JCP  | 105 | 10171 | 1996 | RJ BEMISH, RE MILLER, X YANG, G SCOLES  |
| Ar              | HCCCCH                              | mw      | JMSp | 185 | 178   | 1997 | K MATSUMURA, Y OHSHIMA, Y ENDO  |
| Ar              | C2H4                                | IT      | JCP  | 98  | 3754  | 1993 | PA BLOCK, LG PETERSEN, RE MILLER  |
| Ar              | C2H4                                | mw      | JCP  | 119 | 8448  | 2003 | Y LU, W JAEGER  |
| Ar              | HCN                                 |         | JCP  | 81  | 4922  | 1984 | KR LEOPOLD, GT FRASER, FJ LIN, DD NELSON JR, W KLEMPERER                              |
| Ar              | HCN                                 |         | JCP  | 90  | 30    | 1989 | TD KLOTS, CE DYKSTRA, HS GUTOWSKY   |
| Ar              | HCN                                 | I       | JCP  | 91  | 3319  | 1989 | GT FRASER, AS PINE  |
| Ar              | HCN                                 |         | CPL  | 161 | 308   | 1989 | RE BUMGARNER, GA BLAKE  |
| Ar              | HCN                                 | T       | JCP  | 93  | 7666  | 1990 | DC CLARY, CE DATEO, T STOECKLIN   |
| Ar              | HCN                                 |         | COL  |     | RA5   | 1991 | D YARRON, W KLEMPERER   |
| Ar              | HCN                                 |         | COL  |     | FA3   | 1991 | TC GERMANN, T EMILSSON, HS GUTOWSKI   |
| Ar              | HCN                                 |         | JCP  | 95  | 3017  | 1991 | AL COOKSY, S DRUCKER, J FAEDER, CA GOTTLIEB, W KLEMPERER                              |
| Ar              | HCN                                 |         | JCP  | 98  | 5158  | 1993 | S DRUCKER, AL COOKSY, W KLEMPERER   |
| Ar              | HCN ex vib                          | mw      | JCP  | 493 | 103   | 1995 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar              | HCN                                 | T       | JCP  | 102 | 7289  | 1994 | FM TAO, S DRUCKER, W KLEMPERER  |
| Ar              | DCN                                 | mm      | JMSp | 185 | 189   | 1997 | M SHIRASAKA, K TANAKA   |
| Ar              | HCN                                 | mm      | JCP  | 104 | 9747  | 1996 | K UEMURA, A HARA, K TANAKA  |
| Ar              | HCN                                 | T       | CPL  | 297 | 458   | 1998 | AJC VARANDAS, SPJ RODRIGUES, ..., PAJ GOMES   |
| Ar              | HCN                                 | T       | JCP  | 110 | 1416  | 1999 | SM CYBULSKI, J COUVILLION, J KLOS, G CHALASINSKI                                      |
| Ar              | DCN                                 | mm      | JCP  | 113 | 1524  | 2000 | K TANAKA, S BAILLEUX, A MIZOGUCHI, K HARADA, T BABA, I OGAWA, M SHIRASAKA             |
| Ar              | HCN                                 | mm      | JMSp |     |       | 2003 | A MIZOGUCHI, K HARADA, M SHIRASAKA, K TANAKA  |
| Ar              | HCN                                 | T       | JCP  | 114 | 851   | 2001 | RR TOCZYLOWSKI, F SLAWOMIR, M CYBULSKI  |
| Ar              | (HCN) <sub>2</sub>                  |         | JCP  | 88  | 1557  | 1988 | RS RUOFF, TI EMILSSON, TD KLOTS, C CHAUNG, HS GUTOWSKY                                |
| Ar <sub>2</sub> | HCN                                 | M       | JCP  | 93  | 6216  | 1990 | HS GUTOWSKY, TD KLOTS, CE DYKSTRA   |
| Ar <sub>3</sub> | HCN                                 | mwT     | JCP  | 103 | 3917  | 1995 | HS GUTOWSKY, E ARUNAN, T EMILSSON, SL TSCHOPP, CE DYKSTRA                             |
| Ar              | NH <sub>3</sub>                     | #       | JCP  | 82  | 2535  | 1985 | GT FRASER, DD NELSON JR, A CHARO, W KLEMPERER   |
| Ar              | NH <sub>3</sub>                     |         | JCP  | 85  | 5512  | 1986 | DD NELSON JR, GT FRASER, KI PETERSON, K ZHAO, W KLEMPERER, FJ LOVAS, RD SUENRAM       |
| Ar              | NH <sub>3</sub>                     | I       | JCP  | 95  | 9     | 1991 | CA SCHMUTTENMAER, RC COHEN, JG LOESER, RJ SAYKALLY                                    |
| Ar              | NH <sub>3</sub>                     |         | MP   | 71  | 453   | 1990 | DH GWO, M HAVENITH, KL BUSAROW, CA SCHMUTTENMAER, YT LEE, RJ SAYKALLY                 |
| Ar              | NH <sub>3</sub>                     | I       | JCP  | 94  | 7061  | 1991 | GT FRASER, AS PINE, WA KREINER  |
| Ar              | NH <sub>3</sub>                     | T       | JCP  | 94  | 491   | 1991 | M BULSKI, PES WORMER, A VAN DER AVOIRD  |
| Ar              | NH <sub>3</sub>                     | T       | JCP  | 94  | 501   | 1991 | JWI VAN BLADEL, A VAN DER AVOIRD, PES WORMER  |
| Ar              | NH <sub>3</sub>                     |         | CP   | 151 | 407   | 1991 | E ZWART, WL MEERTS  |
| Ar              | NH <sub>3</sub>                     | mm & mw | JCP  | 95  | 793   | 1991 | E ZWART, H LINNARTZ, WL MEERTS, GT FRASER, DD NELSON JR, W KLEMPERER                  |
| Ar              | NH <sub>3</sub> umb vib             |         | CP   | 164 | 47    | 1992 | JWI VANBLADEL, A VANDERAVOIRD, PES WORMER   |
| Ar              | NH <sub>3</sub> far I               |         | JCP  | 100 | 2413  | 1994 | A GRUSHOW, WA BURNS, SW REEVE, MA DVORAK, KR LEOPOLD                                  |
| Ar              | NH <sub>3</sub> far I               |         | JCP  | 101 | 139   | 1994 | CA SCHMUTTENMAER, JG LOESER, RJ SAYKALLY  |
| Ar              | NH <sub>3</sub>                     | T       | JCP  | 101 | 146   | 1994 | CA SCHMUTTENMAER, RC COHEN, RJ SAYKALLY   |
| Ar              | NH <sub>3</sub>                     | T       | JCP  | 101 | 1129  | 1994 | FM TAO, W KLEMPERER   |
| Ar              | NH <sub>3</sub>                     | I       | COL  |     | TL04  | 1995 | S XU, SW SHARPE, GT FRASER  |
| Ar              | ND <sub>3</sub>                     | T       | JCP  | 106 | 9141  | 1997 | J MILLAN, N HALBERSTADT, G VAN DER SANDEN, A VAN DER AVOIRD                           |
| Ar              | ND <sub>3</sub>                     | mw      | JCP  | 114 | 3968  | 2001 | J van WIJNGAARDEN, W JAEGER   |
| Ar <sub>2</sub> | NH <sub>3</sub>                     | mw      | PCCP | 4   | 4883  | 2002 | J van WIJNGAARDEN, W JAEGER   |
| Ar <sub>3</sub> | NH <sub>3</sub>                     | mw      | JCP  | 116 | 2379  | 2002 | J van WIJNGAARDEN, W JAEGER   |
| Ar              | NH <sub>2</sub> <sup>+</sup>        | I       | JPCA | 102 | 10017 | '98  | O DOPFER, SA NIZKORO, ..., K HARADA   |
| Ar              | HN <sub>2</sub> <sup>+</sup>        | I       | JCP  | 107 | 8706  | 1997 | T SPECK, H LINNARTZ, JP MAIER   |
| Ar              | CICN                                |         | JCP  | 75  | 631   | 1981 | MR KEENAN, DB WOZNIAK, WH FLYGARE   |
| Ar              | CIF                                 |         | JCP  | 61  | 193   | 1974 | SJ HARRIS, SE NOVICK, W KLEMPERER, WE FALCONER  |
| Ar              | CIF                                 | T       | JCP  | 97  | 440   | 1992 | FM TAO, W KLEMPERER   |
| Ar              | CIF                                 | T       | JCP  | 99  | 3700  | 1993 | J SADLEJ, G CHALASINSKI, MM SZCZESNIAK  |
| Ar              | CIF                                 | T       | CP   | 213 | 33    | 1996 | FY NAUMKIN  |
| Ar              | OCS                                 |         | JCP  | 63  | 881   | 1975 | SJ HARRIS, KC JANDA, SE NOVICK, W KLEMPERER   |
| Ar              | OCS                                 |         | JCP  | 79  | 2559  | 1983 | JA SHEA, WG READ, EJ CAMPBELL   |
| Ar              | OCS                                 | I       | CPL  | 118 | 12    | 1985 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE                                    |
| Ar              | OCS                                 |         | JCP  | 87  | 2010  | 1987 | FJ LOVAS, RD SUENRAM  |
| Ar              | OCS                                 | I       | JMSp | 133 | 423   | 1989 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE                                    |
| Ar              | OCS                                 |         | COL  |     | FA7   | 1991 | L NEMES, SL MARUCA, AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI                           |
| Ar              | OCS                                 |         | JMSp | 151 | 206   | 1992 | Y XU, W JAEGER, MCL GERRY   |
| Ar              | OCS dipole                          |         | JMSp | 160 | 422   | 1993 | AM ANDREWS, L NEMES, SL MARUCA, KW HILLIG II, RL KUCZOWSKI, JS MUENTER                |
| Ar <sub>2</sub> | OCS                                 |         | JCP  | 98  | 2735  | 1993 | Y XU, MCL GERRY, JP CONNELLY, BJ HOWARD   |
| Ar <sub>2</sub> | OCS dipole                          |         | CP   | 249 | 41    | 1999 | D CONSALVO, J GRIPP   |
| Ar              | F <sub>2</sub> CO                   |         | JCP  | 79  | 4724  | 1983 | JA SHEA, EJ CAMPBELL  |
| Ar              | (CH) <sub>4</sub> O                 |         | JCP  | 77  | 5242  | 1982 | SG KUKOLICH, JA SHEA  |
| Ar              | (CH) <sub>4</sub> O                 |         | JACS | 105 | 2207  | 1983 | SG KUKOLICH   |
| Ar              | (CH) <sub>4</sub> O dipole          |         | JPC  | 94  | 4453  | 1990 | JJ OH, KW HILLIG II, RL KUCZKOWSKI, RK BOHN {furan}                                   |
| Ar              | (CH) <sub>4</sub> O                 | m       | JMST | 351 | 7     | 1995 | RM SPYCHER, L HAUSHERR-PRIMO, G GRASSI, A BAUDER                                      |
| Ar <sub>2</sub> | (CH) <sub>4</sub> O                 |         | CPL  | 191 | 102   | 1992 | RM SPYCHER, PM KING, A BAUDER   |
| Ar <sub>2</sub> | (CH) <sub>4</sub> O                 | m       | JMST | 351 | 7     | 1995 | RM SPYCHER, L HAUSHERR-PRIMO, G GRASSI, A BAUDER                                      |
| Ar              | c-(CH) <sub>4</sub> S               | mw      | ZNAT | 48  | 1107  | 1993 | U KRETSCHMER, W STAHL, H DREIZLER   |
| Ar              | c-(CH <sub>2</sub> ) <sub>4</sub> S | mw      | PCCP | 1   | 239   | 1999 | ME SANZ, JC LOPEZ, JL ALONSO, S MELANDRI, W CAMINATI, PG FAVERO {tetrahydrothiophene} |

|                 |   |       |      |     |      |      |   |
|-----------------|---|-------|------|-----|------|------|---|
| Ar              | (CH <sub>2</sub> CHCH <sub>2</sub> ) <sub>2</sub> O | mw    | CP   | 218 | 267  | 1997 | JL ALONSO, FJ LORENZO, JC LOPEZ, A LESARRI, S MATA, H DREIZLER                                      |
| Ar              | c-(CHCH <sub>2</sub> ) <sub>2</sub> O               | mm    | MP   | 91  | 663  | 1997 | W CAMINATI, PG FAVERO, S MELANDRI, J MAKAREWICZ {2,5-dihydrofuran}                                  |
| Ar              | c-CHCH <sub>2</sub> CH <sub>2</sub> O               | mm    | JCP  | 107 | 5714 | 1997 | A MARIS, S MELANDRI, W CAMINATI, PG FAVERO, J MAKAREWICZ {2,3-dihydrofuran}                         |
| Ar              | c-C <sub>4</sub> H <sub>8</sub> O                   | mw    | CP   | 239 | 229  | 1998 | S MELANDRI, JC LOPEZ, PG FAVERO, W CAMINATI, JL ALONSO {tetrahydrofuran}                            |
| Ar              | c-CH <sub>2</sub> OCH <sub>2</sub> OCH <sub>2</sub> | mw    | JMSp | 196 | 338  | 1999 | G MACCAFERRI, H DREIZLER, W CAMINATI {1,3-dioxolane}  |
| Ar              | c-(CH) <sub>4</sub> NH                              |       | JPC  | 94  | 4453 | 1990 | JJ OH, KW HILLIG II, RL KUCZKOWSKI, RK BOHN {pyrrole}   |
| Ar              | c-(CH) <sub>4</sub> NH dipole                       |       | JPC  | 93  | 3456 | 1989 | RK BOHN, KW HILLIG II, RL KUCZKOWSKI {pyrrole}  |
| Ar              | c-C <sub>4</sub> H <sub>4</sub> N <sub>2</sub>      | mm    | JPC  | 101 | 9272 | 1997 | W CAMINATI, A MILLEAGGI, PG FAVERO, J MAKAREWICZ {pyridazine}                                       |
| Ar              | c-C <sub>3</sub> H <sub>3</sub> NNH                 | mw    | CP   | 239 | 223  | 1998 | W CAMINATI, PG FAVERO, B VELINO {pyrazole}  |
| Ar              | c-(CH) <sub>4</sub> NCH <sub>3</sub>                | mw    | MP   | 95  | 1021 | 1998 | S HUBER, J MAKAREWICZ, ..., A BAUDER {N-methylpyrrole}  |
| Ar              | c-(CH) <sub>5</sub> N                               | m     |      |     |      | 1994 | D PETITPREZ, F BETTENS, A BAUDER {pyridine}   |
| Ar <sub>2</sub> | c-(CH) <sub>5</sub> N                               | m     |      |     |      | 1994 | D PETITPREZ, A BAUDER {pyridine}  |
| Ar              | c-(CH) <sub>3</sub> NCHN                            | mm    | CPL  | 268 | 393  | 1997 | W CAMINATI, PG FAVERO, S MELANDRI, R MEYER {pyrimidine}   |
| Ar              | c-(CH) <sub>4</sub> NCH <sub>3</sub>                |       |      |     |      | 1994 | SR HUBER, A BAUDER {methylpyrrole}  |
| Ar              | c-C <sub>4</sub> H <sub>7</sub> CN                  | mw    |      |     |      | 2012 | WC PRINGLE, DJ FROHMAN, W NDUGIRE, SE NOVICK {cyanocyclobutane}                                     |
| Ar              | CH <sub>3</sub> (CHCH <sub>2</sub> O)               | mw    | PCCP | 5   | 1359 | 2003 | S BLANCO, S MELANDRI, A MARIS, W CAMINATI, B VELINO, Z KISIEL {propylene oxide}                     |
| Ar              | CH <sub>3</sub> Cl                                  | #     | JCP  | 71  | 4189 | 1979 | JM STEED, LS BERNSTEIN, TA DIXON, KC JANDA, W KLEMPERER   |
| Ar              | CH <sub>3</sub> Cl                                  |       | JCP  | 75  | 1113 | 1981 | RL DELEON, JS MUENTER   |
| Ar              | CH <sub>3</sub> Cl                                  |       | JCP  | 86  | 3107 | 1987 | GT FRASER, RD SUENRAM, FJ LOVAS   |
| Ar              | NO  | T     | JPC  | 90  | 3331 | 1986 | PDA MILLS, CM WESTERN, BJ HOWARD  |
| Ar              | NO  | m     | JPC  | 90  | 4961 | 1986 | PDA MILLS, CM WESTERN, BJ HOWARD  |
| Ar              | NO  | D     | JCP  | 85  | 1418 | 1986 | K SATO, Y ACHIBA, H NAKAMURA, K KIMURA  |
| Ar              | NO  | PE    | JCP  | 96  | 2594 | 1992 | M TAKAHASHI   |
| Ar              | NO  | T     | JPC  | 98  | 1073 | 1994 | T SCHMELZ, P ROSUMS, MH ALEXANDER   |
| Ar              | NO  | E     | JCP  | 108 | 9313 | 1998 | N SHAFIZADEH, Ph BRECHIGNAC, M DYNDAARD, JH FILLION, D GAUYACQ, B LEVY, JC MILLER, T PINO, M RAOULT |
| Ar              | NO  | RTPI  | JCP  | 109 | 4361 | 1998 | P MACK, JM DYKE, DM SMITH, TG WRIGHT, H MEYER   |
| Ar              | NO  | T     | JCP  | 111 | 7435 | 1999 | MH ALEXANDER  |
| Ar              | NO  | I     | CPL  | 318 | 522  | 2000 | Y KIM, K PATTON, J FLENIKEN, H MEYER  |
| Ar              | NO <sup>+</sup>                                     | T     | JCP  | 105 | 7579 | 1995 | TG WRIGHT   |
| Ar              | N <sub>2</sub> O                                    |       | JCP  | 75  | 5285 | 1981 | CH JOYNER, TA DIXON, FA BAIOCCHI, W KLEMPERER   |
| Ar              | N <sub>2</sub> O                                    | I     | FT2  | 82  | 1137 | 1986 | J HODGE, GD HAYMAN, TR DYKE, BJ HOWARD  |
| Ar              | N <sub>2</sub> O                                    | I     | JCP  | 98  | 6162 | 1993 | TA HU, EL CHAPPELL, SW SHARPE   |
| Ar              | N <sub>2</sub> O                                    | mw    | JMSp | 184 | 106  | 1997 | HO LEUNG, D GANGWANI, J-U GRABOW  |
| Ar              | N <sub>2</sub> O                                    | mw    | JMSp | 192 | 452  | 1998 | MS NGARI, W JAEGER  |
| Ar              | N <sub>2</sub> O                                    | I     | JMSt | 599 | 117  | 2001 | G GIMMLER, M HAVENITH   |
| Ar <sub>2</sub> | N <sub>2</sub> O                                    | mw    | JCP  | 111 | 3919 | 1999 | MS NGARI, W JAEGER  |
| Ar              | Ne N <sub>2</sub> O                                 | mw    | MP   | 99  | 13   | 2001 | MS NGARI, Y XU, W JAEGER  |
| Ar              | NO <sub>2</sub>                                     | mw    | CPL  | 222 | 443  | 1994 | RJ LOW, CJ WHITHAM, TD VARBERG, BJ HOWARD   |
| Ar              | NO <sub>2</sub>                                     | mw I  | JCP  | 105 | 6756 | 1996 | RJ LOW, MD BROOKS, CJ WHITHAM, BJ HOWARD  |
| Ar              | N <sub>2</sub>                                      |       | CPL  | 196 | 274  | 1992 | W JAEGER, MCL GERRY   |
| Ar              | N <sub>2</sub> dip surf                             | T     | JCP  | 113 | 98   | 2000 | F WANG, FRW McCOURT, RJ LE ROY  |
| Ar              | N <sub>2</sub>                                      | T     | MP   | 90  | 875  | 1997 | FY NAUMKIN  |
| Ar              | N <sub>2</sub>                                      | T     | JCP  | 110 | 8525 | 1999 | B FERNANDEZ, H KOCH, J MAKAREWICZ   |
| Ar              | O <sub>2</sub>                                      | T     | JCP  | 79  | 1170 | 1983 | A VAN DER AVOIRD  |
| Ar              | O <sub>2</sub>                                      |       | CP   | 92  | 9    | 1985 | J METTES, B HEYDEN, P VERHOEVE, J REUSS, DC LAINE, G BROCKS   |
| Ar              | O <sub>3</sub>                                      |       | JCP  | 71  | 4487 | 1979 | RL DELEON, KM MACK, JS MUENTER  |
| Ar              | O <sub>3</sub>                                      |       | FDCS | 73  | 63   | 1982 | JS MUENTER, RL DELEON, A YOKOZEKI   |
| Ar              | SO <sub>3</sub>                                     |       | JCP  | 73  | 137  | 1980 | KH BOWEN, KR LEOPOLD, KV CHANCE, W KLEMPERER  |
| Ar              | SO <sub>3</sub> (33 <sup>^</sup> S)                 | mw    | JMSp | 191 | 398  | 1998 | DL FIACCO, B KIRCHNER, WA BURNS, KR LEOPOLD   |
| Ar              | SO <sub>3</sub> HCN                                 | mw    | MP   |     |      | 2006 | CS BRAUER, MB CRADDOCK, KJ HIGGINS, KR LEOPOLD  |
| Ar              | SO <sub>2</sub>                                     |       | JCP  | 73  | 2044 | 1980 | RL DELEON, A YOKOZEKI, JS MUENTER   |
| Ar              | SO <sub>2</sub>                                     |       | FDCS | 73  | 63   | 1982 | JS MUENTER, RL DELEON, A YOKOZEKI   |
| Ar              | SO <sub>2</sub>                                     |       | JMSp | 147 | 46   | 1991 | LH COURDERT, K MATSUMURA, FJ LOVAS  |
| Ar              | SO <sub>2</sub>                                     | I     | JMSp | 151 | 334  | 1992 | AK LEWIN, MA WALSH, TR DYKE   |
| Ar              | SO <sub>2</sub>                                     | Tmw   | JMSt | 599 | 57   | 2001 | M SCHAFFER  |
| Ar              | CO  | I     | JMSp | 153 | 475  | 1992 | ARW McKELLAR, YP ZENG, SW SHARPE, C WITTIG, RA BEAUDET  |
| Ar              | CO  | mw    | JCP  | 98  | 9399 | 1993 | T OGATA, W JAEGER, I OZIER, MCL GERRY   |
| Ar              | CO  | I     | COL  | 93  | TD05 | 1993 | S CIVIS, ARW McKELLAR   |
| Ar              | CO  | T     | JCP  | 101 | 1006 | 1994 | V CASTELLS, N HALBERSTADT, SK SHIN, RA BEAUDET, C WITTIG  |
| Ar              | CO  | mw-mm | JCP  | 102 | 3587 | 1995 | W JAEGER, MCL GERRY   |
| Ar              | CO  | mm    | JMSp | 176 | 58   | 1996 | M HEPP, W JAEGER, I PAK, G WINNEWISSER  |
| Ar              | CO  | I     | MP   | 86  | 1233 | 1995 | S KOENIG, G HILPERT, M HAVENITH   |
| Ar              | CO  | T     | JCP  | 104 | 183  | 1996 | S SHIN, SK SHIN, F-M TAO  |
| Ar              | CO  | T     | JCP  | 105 | 89   | 1996 | G JANSEN  |
| Ar              | CO  | I     | MP   | 88  | 859  | 1996 | Y XU, ARW McKELLAR  |
| Ar              | CO  | mm    | JMSp | 183 | 295  | 1997 | M HEPP, R GENDRIESCH, I PAK, F LEWEN, G WINNEWISSER   |
| Ar              | CO  | mm    | MP   | 92  | 229  | 1997 | M HEPP, R GENDRIESCH, I PAK, YA KURITSYN  |
| Ar              | CO  | mwmm  | RSI  | 69  | 4061 | 1998 | VN MARKOV, Y XU, W JAEGER   |
| Ar              | CO  | mm    | JMSp | 196 | 139  | 1999 | R GENDRIESCH, I PAK, F LEWEN, L SURIN, DA ROTH, G WINNEWISSER                                       |
| Ar              | CO  | T     | JCP  | 112 | 4604 | 2000 | RR TOCZYLOWSKI, SM CYBULSKI   |
| Ar              | CO  | I     | MP   | 98  | 111  | 2000 | ARW McKELLAR  |
| Ar              | CO  | I     | MP   | 20  | 1423 | 2003 | I SCHEELE, M HAVENITH   |

|      |                             |        |       |      |       |      |  |
|------|-----------------------------|--------|-------|------|-------|------|--|
| Ar   | CO2                         |        | JCP   | 70   | 4095  | 1979 | JM STEED, TA DIXON, W KLEMPERER  |
| Ar   | CO2                         |        | JCP   | 75   | 5977  | 1981 | JM STEED, TA DIXON, W KLEMPERER  |
| Ar   | CO2                         |        | JCP   | 88   | 6157  | 1988 | GT FRASER, AS PINE, RD SUENRAM   |
| Ar   | CO2                         | I      | JCP   | 89   | 100   | 1988 | AS PINE, GT FRASER   |
| Ar   | CO2                         | I      | JCP   | 94   | 233   | 1991 | SW SHARP, D REIFSCHNEIDER, C WITTIG, RA BEAUDET                                      |
| Ar   | CO2                         | ID     | JCP   | 97   | 4890  | 1992 | EJ BOHAC, MD MARSHALL, RE MILLER   |
| Ar   | CO2                         | T      | JCP   | 97   | 4901  | 1992 | EJ BOHAC, MD MARSHALL, RE MILLER   |
| Ar   | CO2 ( <sup>17</sup> O, etc) | mw     | JCSFT | 92   | 901   | 1996 | H MADER, N HEINEKING, W STAHL, W JAEGER, Y XU  |
| Ar   | CO2                         | T      | JCP   | 104  | 2156  | 1996 | CF ROCHE, A ERNESTI, JM HUTSON, AS DICKINSON   |
| Ar   | CO2                         | T      | JCP   | 104  | 6569  | 1996 | PJ MARSHALL,MM SZCZESNIAK,J SADLEJ,G CHALASINSKI, MA ter HORST, CJ JAMESON           |
| Ar   | CO2                         | T      | JCP   | 105  | 6787  | 1996 | MA ter HORST, CJ JAMESON   |
| Ar   | CO2                         | T      | JCP   | 105  | 9130  | 1996 | JM HUDSON, A ERNESTI, MM LAW, CF ROCHE, RJ WHEATLEY                                  |
| Ar2  | CO2                         | mw     | JMSp  | 157  | 132   | 1993 | YJ XU, W JAEGER, MCL GERRY   |
| Ar2  | CO2                         | I      | JCP   | 104  | 2202  | 1996 | JM SPERHAC, MJ WEIDA, DJ NESBITT   |
| Ar2  | CO2                         | dipole | CP    | 249  | 41    | 1999 | D CONSALVO, J GRIPP  |
| Ar n | CO2                         | T      | JCP   | 109  | 1343  | 1998 | MW SEVERSON  |
| Ar   | CO2                         | T      | JCP   | 112  | 5308  | 2000 | AJ MISQUITTA, R BUKOWSKI, K SZALEWICZ  |
| Ar   | H2S                         |        | JCP   | 82   | 1674  | 1985 | R VISWANATHAN, TR DYKE   |
| Ar   | H2S                         |        | JMSSt | 190  | 163   | 1988 | RE BUMGARNER, DJ PAULEY, SG KUKOLICH   |
| Ar   | H2S                         | mw     | JCP   | 106  | 5309  | 1997 | HS GUTOWSKY, T EMILSSON, E ARUNAN  |
| Ar   | H2S                         | T      | JCP   | 106  | 5316  | 1997 | G de OLIVEIRA, CE DYKSTRA  |
| Ar   | H2S                         | T      | JCP   | 110  | 289   | 1999 | G de OLIVEIRA, CE DYKSTRA  |
| Ar2  | H2S                         | mw     | PCCP  | 7    | 2740  | 2005 | PK MANDAL, DJ RAMDASS, E ARUNAN  |
| Ar3  | H2S                         | mw     | JCP   | 114  | 1242  | 2001 | E ARUNAN, T EMILSSON, HS GUTOWSKY, CE DYKSTRA  |
| Ar   | (H2S)2                      | mw     | IISc  | 85   | 353   | 2005 | PK MANDAL, M GOSWAMI, E ARUNAN   |
| Ar   | NCCN                        |        | JCP   | 80   | 1417  | 1984 | WL EBENSTEIN, JS MUENTER   |
| Ar   | (CH2)2O                     |        | JMSSt | 135  | 435   | 1986 | RA COLLINS, AC LEGON, DJ MILLEN  |
| Ar   | (CH2)2O inverts             | mw     | JMSSt | 599  | 81    | 2001 | P MORESCHINI, W CAMINATI, PG FAVERO, AC LEGON {oxirane}                              |
| Ar   | (CH2O)3                     |        | CPL   | 204  | 139   | 1993 | AC LEGON, DG LISTER {trioxane}   |
| Ar   | NH2CHO                      | M      | JCP   | 89   | 6141  | 1988 | RD SUENRAM, GT FRASER, FJ LOVAS, CW GILLIES, J ZOZOM                                 |
| Ar   | NH2CHO                      | T      | JCP   | 105  | 8213  | 1996 | B KUKAWSKA-TARNAWSKA, G CHALASINSKI, MM SZCZESNIAK                                   |
| Ar   | CH3OH                       |        | JMSp  | 137  | 127   | 1989 | RD SUENRAM, FJ LOVAS, GT FRASER, JZ GILLIES, CW GILLIES, M ONDA                      |
| Ar   | CH3OH                       | mw     | JMSp  | 171  | 248   | 1995 | XQ TANG, L SUN, RL KUCZKOWSKI  |
| Ar   | CH2CHCN                     |        | JCP   | 87   | 4447  | 1987 | RD SUENRAM, FJ LOVAS   |
| Ar   | PF3                         |        | CPL   | 133  | 359   | 1987 | KW HILLIG II, J MATOS, A SCIOLY, RL KUCZKOWSKI                                       |
| Ar   | PF3                         |        | JCP   | 90   | 6949  | 1989 | A TALEB-BENDIAB, MS LABARGE, LL LOHR, RC TAYLOR, KW HILLIG II, RL KUCZKOWSKI, R BOHN |
| Ar   | C5H5N                       | M      | JCP   | 93   | 1255  | 1989 | TD KLOTTS, T EMILSSON, RS RUOFF, HS GUTOWSKY   |
| Ar   | C5H5N                       | mw     | JPC   | 98   | 11863 | 1994 | RM SPYCHER, D PETITPREZ, FL BETTENS, A BAUDER {pyridine}                             |
| Ar   | C5H5N                       | mm     | CPL   | 261  | 267   | 1996 | S MELANDRI, G MACCAFERRI, A MARIS, A MILLEMAGGI, W CAMINATI, PG FAVERO               |
| Ar2  | C5H5N                       | mw     | JPC   | 98   | 11863 | 1994 | RM SPYCHER, D PETITPREZ, FL BETTENS, A BAUDER {pyridine}                             |
| Ar   | H2CO                        | mw     | JCP   | 99   | 7506  | 1993 | SE NOVICK  |
| Ar   | H2CO                        | T      | JCP   | 99   | 5211  | 1993 | J SADLEJ, MM SZCZESNIAK, G CHALASINSKI   |
| Ar   | H2CCO                       | mw     | JMSp  | 207  | 201   | 2001 | CW GILLES, JZ GILLES, SJ AMADON, RD SUENRAM, FJ LOVAS, H WARNER, R MALLOY            |
| Ar   | CH2CO                       | mw     | COL   | TC10 |       | 1994 | R MOLLOY, CW GILLES, JZ GILLES, FJ LOVAS, RD SUENRAM                                 |
| Ar   | D3+                         | mw     | CPL   | 256  | 635   | 1996 | Y OHSHIMA, Y ENDO  |
| Ar   | D2H+                        | mw     | CPL   | 256  | 635   | 1996 | Y OHSHIMA, Y ENDO  |
| Ar   | H3+                         | mm     | JMSp  | 190  | 130   | 1998 | S BAILLEAX, M BOGEY, ..., LH COURDERT  |
| Ar   | D3+                         | mm     | JMSp  | 190  | 130   | 1998 | S BAILLEAX, M BOGEY, ..., LH COURDERT  |
| Ar   | HCO+                        | mw     | JCP   | 106  | 2977  | 1997 | Y OHSHIMA, Y SUMIYOSHI, Y ENDO   |
| Ar   | HCO+                        | I      | CPL   | 288  | 504   | 1998 | H LINNARTZ, T SPECK, JP MAIER  |
| Ar   | HCO                         | E      | JCP   | 107  | 680   | 1997 | SA WRIGHT, PJ DAGDIGIAN  |
| Ar   | H                           | E      | JCP   | 104  | 8245  | 1996 | I DABROWSKI, DW TOKARYK, M VERVLOET, JKG WATSON                                      |
| Ar   | H2                          | I      | FDSCS | 73   | 89    | 1982 | ARW McKELLAR   |
| Ar   | H2                          | I      | JCP   | 105  | 2628  | 1996 | ARW McKELLAR   |
| Ar   | H2                          | T      | JCP   | 105  | 2639  | 1996 | C BISSONNETTEE, CE CHUAQUI, KG CROWELL, RJ LEROY, RJ WHEATLEY, WJ MEATH              |
| Ar   | H2                          | T      | JCP   | 109  | 2233  | 1998 | DE WOON, KA PETERSON, TH DUNNING Jr  |
| Ar   | HD                          | T      | JCP   | 109  | 10823 | '98  | F MRUGALA, R MOSZYNSKI   |
| Ar   | HD                          | T      | JCP   | 115  | 3155  | 2001 | F MRUGALA  |
| Ar   | Al                          | E      | CPL   | 304  | 317   | 1999 | J LEI, PJ DAGDIGIAN  |
| Ar   | AlH                         | E      | JCP   | 102  | 2426  | 1995 | E HWANG, PJ DAGDIGIAN  |
| Ar   | F2                          | T      | JCP   | 110  | 860   | 1999 | KW CHAN, TD POWER, J JAI-NHUKNAN, SM CYBULSKI  |
| Ar   | Cl2                         | T      | JPC   | 92   | 587   | 1988 | BP REID, KC JANDA, N HALBERSTADT   |
| Ar   | Cl2                         | E      | JCP   | 88   | 5433  | 1988 | DD EVARD, JI CLINE, KC JANDA   |
| Ar   | Cl2                         | T      | JCP   | 97   | 341   | 1992 | N HALBERSTADT, S SERNA, O RONCERO, KC JANDA  |
| Ar   | Cl2                         | T      | JCP   | 97   | 440   | 1992 | FM TAO, W KLEMPERER  |
| Ar   | Cl2 T Shaped                | mw     | JCP   | 98   | 3726  | 1993 | Y XU, W JAEGER, I OZIER, MCL GERRY   |
| Ar   | Cl2                         | T      | JCP   | 104  | 9304  | 1996 | F WANG, FRW McCOURT  |
| Ar   | Cl2                         | T      | JCP   | 105  | 5830  | 1996 | KC JANDA, O RONCERO, N HALBERSTADT   |
| Ar   | Cl2                         | T      | CPL   | 261  | 591   | 1996 | AA BUCHACHENKO, NF STEPANOV  |
| Ar   | Cl2                         | T      | CP    | 219  | 161   | 1997 | BL GRIGORENKO, AV NEMUKHIN, VA APKARIAN  |
| Ar   | Cl2 IVR                     | T      | JCP   | 107  | 1406  | 1997 | O RONCERO, D CALOTO, KC JANDA, N HALBERSTADT   |

|         |                  |           |      |      |        |      |   |
|---------|------------------|-----------|------|------|--------|------|---|
| Ar etc  | Cl2              |           | MP   | 91   | 573    | 1997 | J WILLIAMS, A ROHRBACHER, D DJAHANDIDEH, KC JANDA   |
| Ar      | Cl2              | T         | JCP  | 107  | 5702   | 1997 | FY NAUMKIN, FRW McCOURT   |
| Ar      | Cl2              | T         | JCP  | 110  | 7745   | 1999 | SM CYBULSKI, JS HOLT  |
| Ar2     | Cl2              | ED        | JPC  | 94   | 7452   | 1990 | CR BIELER, DD EVARD, KC JANDA   |
| Ar3     | Cl2              | ED        | JPC  | 94   | 7452   | 1990 | CR BIELER, DD EVARD, KC JANDA   |
| Ar      | ClO2             | mw        | JCP  | 119  | 8404   | 2003 | M SCHAFFER, T-K HA, A BAUDER  |
| Ar      | Br2              | T         | MP   | 96   | 1043   | 1999 | FY NAUMKIN, FRW McCOURT   |
| Ar      | H2O              | IM        | JCP  | 89   | 4494   | 1988 | RC COHEN, KL BUSAROW, KB LAUGHLIN, GA BLAKE, M HAVENITH, YT LEE, RJ SAYKALLY                    |
| Ar      | H2O              | T         | JCP  | 92   | 157    | 1990 | JM HUTSON   |
| Ar      | H2O              | I         | JCP  | 92   | 169    | 1990 | RC COHEN, KL BUSARO, YT LEE, RJ SAYKALLY  |
| Ar      | H2O              | I         | CoI  |      |        | 1990 | R LASCOLA, CM LOVEJOY, DJ NESBIT  |
| Ar      | H2O              | I         | JPC  | 94   | 7991   | 1990 | RC COHEN, RJ SAYKALLY   |
| Ar      | D2O              | I         | JCP  | 94   | 824    | 1991 | S SUZUKI, RE BUMGARNER, PA STOCKMAN, PG GREEN, GA BLAKE   |
| Ar      | D2O              |           | CP   | 151  | 407    | 1991 | E ZWART, WL MEERTS  |
| Ar      | H2O              |           | JMSp | 144  | 97     | 1990 | GT FRASER, FJ LOVAS, RD SUENRAM, K MATSUMURA  |
| Ar      | H2O              | T         | JCP  | 94   | 8096   | 1991 | M BULSKI, PES WORMER, A VAN DER AVOIRD  |
| Ar      | H2O              | IT        | JCP  | 95   | 7891   | 1991 | RC COHN, RJ SAYKALLY  |
| Ar      | H2O              | I         | JCP  | 97   | 8096   | 1992 | DJ NESBITT, R LASCOLA   |
| Ar      | H2O              | TD        | JCP  | 97   | 8111   | 1992 | C BISSONNETTE, DC CLARY   |
| Ar      | H2O              | IT        | JCP  | 98   | 6007   | 1993 | RC COHEN, RJ SAYKALLY   |
| Ar      | H2O              | hyperfine | JCP  | 98   | 5235   | 1993 | TC GERMANN, HS GUTOWSKY   |
| Ar      | H2O              | T         | JCP  | 101  | 1129   | 1994 | FM TAO, W KLEMPERER   |
| Ar      | H2O              | T         | JCP  | 103  | 1498   | 1995 | R BURCL, G CHALASINSKI, R BUKOWSKI, MM SZCZESNIAK   |
| Ar      | H2O              | I         | JCP  | 106  | 3078   | 1997 | MJ WEIDA, DJ NESBITT  |
| Ar      | H2O              | D         | MP   | 99   | 1981   | 2001 | RN DIXON, X YANG, SA HENICH, D DAI, X YANG  |
| Ar      | H2O HCN          | mw        | JCP  | 102  | 3032   | 1995 | HS GUTOWSKY, AC HOEY, SL TSCHOPP, JD KEEN, CE DYKSTRA   |
| Ar      | H2O C6H5OH ZEKE  | CP        |      | 207  | 437    | 1996 | O DOPFER, M MELF, K MULLER-DETHLEFS   |
| Ar      | (H2O)2           | mw        | JACS | 116  | 8418   | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar      | (H2O)2           | mw        | JCP  | 116  | 4886   | 2002 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar      | (H2O)3           | mw        | JACS | 116  | 8418   | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar2     | H2O              | mw        | JACS | 116  | 8418   | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar2     | H2O              | far I     | COL  | TL05 |        | 1995 | M BROWN, K LIU, M ELROD, L DORE, RJ SAYKALLY  |
| Ar2     | H2O              | mw        | JCP  | 105  | 8495   | 1996 | E ARUNAN, CE DYKSTRA, T EMILSSON, HS GUTOWSKY   |
| Ar3     | H2O              | mw        | JACS | 116  | 8418   | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar3     | H2O              | mw        | JCP  | 114  | 1242   | 2001 | E ARUNAN, T EMILSSON, HS GUTOWSKY, CE DYKSTRA   |
| Ar1,2,3 | (H2O)2           | PE        | CPL  | 321  | 333    | 2000 | GH LEE, ST ARNOLD, ..., KH BOWEN  |
| Ar      | BH               | T         | JCP  | 101  | 2887   | 1994 | MH ALEXANDER, S GREGURICK, PJ DAGDIGIAN   |
| Ar      | BH               | E         | JCP  | 101  | 2903   | 1994 | E HWANG, PJ DAGDIGIAN   |
| Ar      | OH               | E         | JCP  | 89   | 7030   | 1988 | WM FAWZY, MC HEAVEN   |
| Ar      | OH               | EM        | JCP  | 92   | 909    | 1989 | WM FAWZY, MC HEAVEN   |
| Ar      | OH               | E         | CPL  | 163  | 203    | 1989 | KM BECK, MT BERRY, MR BRUSTEIN, MI LESTER   |
| Ar      | OH               | T         | JPC  | 94   | 2226   | 1990 | JM BOWMAN, B GAZDY, P SCHAFFER, MC HEAVEN   |
| Ar      | OH               | E         | CoI  |      |        | 1990 | SK KULKARNI, Y LIN, MC HEAVEN   |
| Ar      | OD               | E         | JCP  | 91   | 6657   | 1989 | JL LEMAIRE, WUL TCHANG-BRILLET, N SHAFIZADEH, J ROSTAS, F ROSTAS                                |
| Ar      | OD               | E         | JCP  | 93   | 872    | 1990 | JL LEMAIRE, WUL TCHANG-BRILLET, F ROSTAS, J ROSTAS, N SHAFIZADEH, MC HEAVEN                     |
| Ar      | OH               | E         | CPL  | 175  | 561    | 1991 | J SCHLEIPEN, L NEMES, J HEINZE, JJ TER MEULEN   |
| Ar      | OH               | T         | JCP  | 94   | 4149   | 1991 | C CHAKRAVARTY, DC CLARY   |
| Ar      | OH               | T         | JCP  | 94   | 7602   | 1991 | ML DUBERNET, D FLOWER, JM HUTSON  |
| Ar      | OH               | E         | JCP  | 95   | 7086   | 1991 | BC CHANG, L YU, D CULLIN, B REHFUSS, J WILLIAMSON, TA MILLER, WM FAWZY X ZHENG, S FEI, M HEAVEN |
| Ar      | OH               | T         | JCP  | 96   | 2573   | 1992 | WH GREEN Jr, MI LESTER  |
| Ar      | OH               | E         | JCP  | 96   | 7890   | 1992 | MT BERRY, RA LOOMIS, LC GIANCARLO, MI LESTER  |
| Ar      | OH               | m         | JCP  | 95   | 7001   | 1991 | Y OHSHIMA, M IIDA, Y ENDO   |
| Ar      | OH               |           | COL  | 92   | RE05   | 1992 | W BASINGER, U SCHNUPF, X ZHENG, MC HEAVEN   |
| Ar      | OH               | E         | JCP  | 97   | 7999   | 1992 | BC CHANG, JM WILLIAMSON, DW CULLIN, JR DUNLOP, TA MILLER  |
| Ar      | OH               | E         | COL  | 93   | RE07   | 1993 | BC CHANG, JM WILLIAMSON, TA MILLER  |
| Ar      | OH               | T         | COL  | 92   | RE09   | 1992 | U SCHNUPF, JM BOWMAN, MC HEAVEN   |
| Ar      | OH               | T         | JCP  | 99   | 7477   | 1993 | ML DUBERNET, JM HUTSON  |
| Ar      | OH               | D         | JCP  | 101  | 2914   | 1994 | LC GIANCARIO, RW RANDALL, SE CHOI, MI LESTER  |
| Ar      | OH               | T         | JCP  | 102  | 1981   | 1995 | SE CHOI, MI LESTER, H WEON, JC LIGHT  |
| Ar      | OH PES from exp  | JCP       |      | 102  | 2282   | 1995 | T-K HO, H RABITZ, SE CHOI, MI LESTER  |
| Ar      | OH               | mw        | FDCS | 97   | 341    | 1994 | Y ENDO,   |
| Ar      | OH               | T         | JCP  | 104  | 1187   | 1996 | TS HO, H RABITZ, SE CHOI, MI LESTER   |
| Ar      | OD quantum beats |           | JCP  | 104  | 5365   | 1996 | RT CARTER, IM POVEY, H BITTO, JR HUBER  |
| Ar      | OH               | I         | JCP  | 112  | 4942   | 2000 | RT BONN, MD WHEELER, MI LESTER  |
| Ar      | OH               | T         | JCP  | 112  | 4952   | 2000 | J KLOS, G CHALASINSKI, MT BERRY, RA KENDALL, R BURCL, MM SZCZESNIAK, SM CYBILSKI                |
| Ar      | OH               | mm        | JCP  | 125  | 124307 | 06   | Y SUMIYOSHI, I FUNAHARA, K SATO, Y OHSHIMA, Y ENDO  |
| Ar      | HO2              | mw        | JCP  | 122  | 184302 | 05   | K SUMA, W FUNATO, Y SUMIYOSHI, Y ENDO   |
| Ar      | SH               | E         | JCP  | 93   | 4301   | 1993 | MC YANG, AP SALZBERG, BC CHANG, CC CARTER, TA MILLER  |
| Ar      | SH               | E         | CoI  |      |        | 1987 | W FAWZY, MC HEAVEN  |
| Ar      | SH               | E         | JCP  | 107  | 3437   | 1997 | MC YANG, CC CARTER, TA MILLER   |

|     |                  |       |        |      |        |  |   |
|-----|------------------|-------|--------|------|--------|--|---|
| Ar  | SH               | E     | JCP    | 107  | 3447   | 1997   | CC CARTER, TA MILLER  |
| Ar  | SH               | T     | JCP    | 107  | 3460   | 1997   | PP KORAMBATH, XT WU, EF HAYES, CC CARTER, TA MILLER                             |
| Ar  | SH               | E     | JCP    | 110  | 5149   | 1999   | SR MACKENZIE, O VOTAVA, JR FAIR, DJ NESBITT                                     |
| Ar  | SH               | mw    | JCP    | 113  | 10121  | '00  | Y SUMIYOSHI, Y ENDO, Y OHSHIMA  |
| Ar  | SH               | mwT   | JMSp   |      |        | 2003   | Y SUMIYOSHI, Y ENDO, Y OHSHIMA  |
| Ar  | SH               | mwm   | JCP    | 123  | 054324 | '05  | Y SUMIYOSHI, H KATSUNUMA, K SUMA, Y ENDO  |
| Ar  | SH               | mwT   | JCP    | 123  | 054325 | '05  | Y SUMIYOSHI, Y ENDO   |
| Ar2 | SH               | E     | JCP    | 110  | 5149   | 1999   | SR MACKENZIE, O VOTAVA, JR FAIR, DJ NESBITT                                     |
| Ar  | CH               | E     | JCP    | 99   | 91     | 1993   | GW LEMIRE, MJ MCQUAID, AJ KOTLAR, RC SAUSA                                      |
| Ar  | CH               | T     | JCP    | 101  | 4547   | 1994   | MH ALEXANDER, S GREGURICK, PJ DAGDIGIAN, GW LEMIRE, MJ MCQUAID, RC SAUSA        |
| Ar  | CH               | E     | JCP    | 113  | 1775   | 2000   | AV KOMISSAROV, MC HEAVEN  |
| Ar  | Al               | E     | JCP    | 92   | 2733   | 1990   | MJ MCQUAID, JL GOLE, MC HEAVEN  |
| Ar  | C6H6             | E     | JCP    | 104  | 865    | 1996   | E RIEDLE, D SUSSMAN, TH WEBER, HJ NEUSSER                                       |
| Ar  | C6H6             | mw    | CPL    | 173  | 435    | 1990   | T BRUPBACHER, A BAUDER  |
| Ar  | C6H6             | m     | Austin |      |        | 1992   | A BAUDER  |
| Ar  | C6H6             | T     | JCP    | 95   | 391    | 1991   | P HOBZA, HL SELZLE, EW SCHLAG   |
| Ar  | C6H6             | vib   | CPL    | 196  | 410    | 1992   | O BLUDSKY, V SPIRKO, V HROUDA, P HOBZA  |
| Ar  | C6H6             | T     | JCP    | 98   | 5327   | 1993   | A VAN DER AVOIRD  |
| Ar  | C6D3H3           | m     | JCP    | 101  | 9736   | 1994   | TH BRUPBACHER, J MAKAREWICZ, A BAUDER   |
| Ar  | C6H6             | T     | JCP    | 101  | 9747   | 1994   | W KLOPPER, HP LUTHI, TH BRUPBACHER, A BAUDER                                    |
| Ar  | C6H6             | Ra    | JCP    | 107  | 2193   | 1997   | W KIM, PM FELKER  |
| Ar  | C6H6             | E     | JCP    | 108  | 8408   | 1998   | R NEUHAUSER, J BRAUN, HJ NUSSER, A VAN DER AVOIRD                               |
| Ar  | C6H6             | T     | JCP    | 108  | 2784   | 1998   | H KOCH, B FERNANDEZ, O CHRISTIANSEN   |
| Ar  | C6H6 H2O         | mw    | JCP    | 101  | 861    | 1994   | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Ar2 | C6H6             | EM    | JCP    | 94   | 7689   | 1991   | T WEBER, HJ NEUSSER   |
| Ar  | C6H5F            | mw    | ZNAT   | 47   | 681    | 1992   | W STAHL, J-U GRABOW {fluorobenzene}   |
| Ar  | C6H4F2           |       |        |      |        |  |   |
| Ar  | C6H5Cl           | mwT   | JCP    | 113  | 9051   | 2000   | JJ OH, I PARK, RJ WILSON, SA PEEBLES, RL KUCZKOWSKI, E KRAKA, D CREMER          |
| Ar  | c-C6H5CN         | mw    | BBPC   | 98   | 970    | 1994   | U DAHMEN, W STAHL, H DREIZLER {benzonitrile}                                    |
| Ar  | C6H5CCH          | E     | CPL    | 343  | 475    | 2001   | K SIGLOW, HJ NEUSSER  |
| Ar  | CN               | E     | CoI    |      |        | 1990   | Y LIN, SK KULKARNI, MC HEAVEN   |
| Ar  | CH3CN            | JCP   | 94     | 5306 | 1991   | RS FORD, RD SUENRAM, GT FRASER, FJ LOVAS, KR LEOPOLD                           |   |
| Ar  | CH3CCH           | MI    | JCP    | 98   | 6031   | 1993   | TA BLAKE, DF EGGERS, SH TSENG, M LEWERENZ, RP SWIFT, RD BECK, RO WATTS, F LOVAS |
| Ar  | HCOOH            | m     | JPC    |      |        | 1994   | II IOANNOU, RL KUCZKOWSKI   |
| Ar  | CdCH3            | E     | COL    |      | FB11   | 1991   | AM ELLIS, ESJ ROBLES, TA MILLER   |
| Ar  | CdCH3            |       | COL    | 92   | RE11   | 1992   | ESJ ROBLES, AM ELLIS, TA MILLER   |
| Ar2 | Hg               | I     | COL    |      | RC8    | 1991   | M OKUNISHI, K YAMANOUCHI, S TSUCHIYA  |
| Ar  | CH2CHF           | M     | JCP    | 95   | 2283   | 1991   | Z KISIEL, PW FOWLER, AC LEGON   |
| Ar  | CH2CF2           | M     | JCP    | 95   | 2283   | 1991   | Z KISIEL, PW FOWLER, AC LEGON   |
| Ar  | CH2CF2           | mw    | JCP    | 112  | 2204   | 2000   | A DELL'ERBA, S MELANDRI, A MILLEMAGGI, W CAMINATI, PG FAVERO                    |
| Ar  | CHFCF2           | M     | JCP    | 95   | 2283   | 1991   | Z KISIEL, PW FOWLER, AC LEGON   |
| Ar  | CH3CHF2          | mw    | CPL    | 316  | 75     | 2000   | B VELINO, S MELANDRI, PG FAVERO, A DELL'ERBA, W CAMINATI                        |
| Ar  | CH2FCH2F         | mm    | CPL    | 321  | 31     | 2000   | S MELANDRI, B VELINO, PG FAVERO, A DELL'ERBA, W CAMINATI                        |
| Ar  | S(CH2)2          |       | CPL    | 189  | 149    | 1992   | AC LEGON, DG LISTER   |
| Ar  | S(CH2)3          | mw    |        |      |        | 1994   | D MCCAMANT, WC PRINGLE {trimethylene sulfide}                                   |
| Ar  | C6H5CHCHC6H5     | CP    |        | 156  | 251    | 1991   | BB CHAMPAGNE, DF PLUSQUELLIC, JF PFANSTIEL, DW PRATT, WM VAN HERPIN, WL MEERTS  |
| Ar  | C6H4CH2C6H4      | EM    | CPL    | 147  | 7      | 1988   | WM VAN HERPEN, WL MEERTS  |
| Ar2 | C6H4NHC6H4       | E     | CPL    | 221  | 46     | 1994   | R SUBMANN, H NEUSSEN  |
| Ar  | C6D5F            | mw    | JMSp   | 446  | 55     | 1998   | RA APPLEMAN, SA PEEBLES, RL KUCZKOWSKI  |
| Ar  | C6H4F2           | E     | CP     | 156  | 261    | 1991   | MC SU, HK O, CS PARMENTER   |
| Ar  | C6H4F2           | mw    | JMSp   | 158  | 278    | 1993   | E JOCHIMS, JU GRABOW, W STAHL   |
| Ar  | C6H4F2 {meta}    | mw    |        |      |        | 1994   | E JOCHIMS, JU GRABOW, W STAHL, MADER  |
| Ar  | C6H4F2 {para}    | RTPI  | JCP    | 102  | 3055   | 1995   | R SUSSMANN, HJ NEUSSER  |
| Ar  | C6H4F2 {para}    | MATI  | JPCA   | 102  | 6068   | 1998   | G LEMBAACH, B BRUTSCHY  |
| Ar  | C6H4F2 {para}    | disso | CPL    | 130  | 103    | 2000   | SM BELLM, JR GASCOOKE, WD LAWRENCE  |
| Ar  | C6H2F2 {para}    | TOF   | JCP    | 115  | 10709  | '01  | SM BELLM, RJ MOULDS, WD LAWRENCE  |
| Ar  | C6H3F3 {1,2,3}   | m     | JMSp   | 410  | 51     | 1997   | M ONDA, Y BITOH, AR HIGHT WALKER  |
| Ar  | C6H3F3 {1,2,4}   | mw    | JMSp   | 180  | 116    | 1996   | E JOCHIMS, H MADER, W STAHL   |
| Ar  | C6H4FCH3 {p}     | RTPI  | CP     | 218  | 325    | 1997   | Y HU, W LU, S YANG  |
| Ar  | C6H4FCH3 {p}     | mw    | JMSp   | 195  | 1      | 1999   | J ROTTSTEGGE, H HARTWIG, H DREIZLER {p-fluorotoluene}                           |
| Ar  | C6H5CN           | mw    | BBPC   | 98   | 970    | 1994   | H DREIZLER, A GUARNIERI, H MADER, W STAHL, DH SUTTER, DAHMAN                    |
| Ar  | C6H5NH2          | E     | JCP    | 105  | 7942   | 1996   | WE SINCLAIR, DW PRATT   |
| Ar  | C6H5NH2          | mw    | CP     | 228  | 301    | 1998   | D CONSALVO, V STORM, ..., H DREIZLER  |
| Ar  | (C6H5)C4H4(C6H5) | COL   | 92     | MG04 | 1992   | S HUMPHREY, B CHAMPAGNE, J PFANSTIEL, D PRATT                                  |   |
| Ar  | HCCCH3           | COL   | 92     | RE01 | 1992   | RD BECK, TA BLAKE, DF EGGERS, M LEWERENZ, FJ LOVAS, P SWIFT, SH TSENG, R WATTS |   |
| Ar  | ICl              | mw    | CPL    | 306  | 133    | 1999   | JB DAVEY, AC LEGON, ..., ER WACLAWIK  |
| Ar  | I2               | E     | JCP    | 97   | 6057   | 1992   | S FEI, X ZHENG, MC HEAVEN   |
| Ar  | I2               | E     | JCP    | 98   | 6642   | 1993   | ML BURKE, W KLEMPERER   |
| Ar  | I2               | E     | JCP    | 101  | 126    | 1994   | MCR COCKETT, JG GOODE, RRJ MAIER, KP LAWLEY, RJ DONOVAN                         |
| Ar  | I2               | ZEKE  | CPL    | 231  | 521    | 1994   | JG GOODE, MC CROCKETT, KP LAWLEY, RJ DONOVAN                                    |

|          |                |      |      |       |        |  |   |
|----------|----------------|------|------|-------|--------|--|---|
| Ar       | I2             | T    | JCP  | 104   | 4999   | 1996   | O RONCERO, SK GRAY  |
| Ar       | I2             | T    | JCP  | 104   | 9913   | 1996   | AA BUCHACHENKO, NF STEPANOV   |
| Ar       | I2             | T    | JCP  | 109   | 359    | 1998   | CF KUNZ, I BURGHARDT, BA HESS   |
| Ar       | I2             | T    | CPL  | 294   | 71     | 1998   | FY NAUMKIN, FRW McCOURT   |
| Ar       | I2             | T    | JCP  | 110   | 960    | 1999   | S ZAMITH, C MEIER, N HALBERSTADT, JA BESWICK  |
| Ar       | I2             | T    | CP   | 240   | 79     | 1999   | FY NAUMKIN  |
| Ar       | I2             | E    | JCP  | 111   | 7844   | 1999   | AE STEVENS MILLER, C-C CHUANG, HC FU, KJ HIGGENS, W KLEMPERER   |
| Ar       | HNCO           | mw   | JMSp | 171   | 402    | 1995   | CW BOYCE, CW GILLES, H WARNER, JZ GILLES, FJ LOVAS, RD SUENRAM  |
| Ar       | HCNO           | mw   | COL  | TC09  |        | 1994   | C BOYCE, CW GILLES, JZ GILLES, FJ LOVAS, RD SUENRAM, HE WARNER  |
| Ar       | C6H7N          | ZEKE | JCP  | 97    | 2843   | 1992   | X ZHANG, JM SMITH, JL KNEE  |
| Ar2      | C6H7N          | ZEKE | JCP  | 97    | 2843   | 1992   | X ZHANG, JM SMITH, JL KNEE  |
| Ar       | C6H5NH2        | E    | CPL  | 260   | 87     | 1996   | M BECUCCI, G PIETRAPERZIA, NM LAKIN, E CASTELLUCCI, P BRECHIGNAC {aniline}  |
| Ar       | C6H5NH2        | mw   | CP   | 237   | 395    | 1998   | V STORM, H DREIZLER, ..., D CONSALVO  |
| Ar       | C6H5NH2        | T    | CP   | 249   | 113    | 1999   | I LOPEZ-TOCON, JC OTERO, M BECUCCI, G PIETRAPERZIA, E CASTELLUCCI   |
| Ar       | C6H5NHCHO      | ZEKE | CPL  | 351   | 121    | 2002   | S ULLRICH, G TARCZAY, X TONG, MS FORD, CE DESSENT, K MULLER-DETHLEFS {trans formanilide}                              |
| Ar       | In             | E    | JCP  | 99    | 4300   | 1993   | PA HACKETT, WJ BALFOUR, AM JAMES, WM FAWZY, BJ SHETTY, B SIMARD   |
| Ar       | CS2            | I    |      |       |        | 1993   | TR DYKE, J CRUZAN, M WALSH  |
| Ar       | H2O HCN        |      | COL  | 93    | TC07   | 1993   | HS GUTOWSKY, AC HOEY, SL TSCHOPP, T EMILSSON, JD KEEN, CE DYKSTRA   |
| Ar       | aromatics      |      | COL  | 93    | TC08   | 1993   | U DAHMEN, JU GRABOW, E JOCHIMS, U KRETSCHMER, U SPOEREL, W STAHL  |
| Ar       | CH3CHO         | mw   | JMSp | 166   | 354    | 1994   | II IOANNOU, RL KUCZKOWSKI   |
| Ar       | CH3CHO         | mw   | JMSp | 171   | 265    | 1995   | II IOANNOU, RL KUCZKOWSKI, JT HOUGEN  |
| Ar       | CH3CHO         | mm   | JMSp | xxx   | xxx    | 2003   | S MELANDRI, A DELL'ERBA, PG FAVERO, W CAMINATI  |
| Ar       | (CH3)2CO       | mw   | JMSp | 213   | 122    | 2002   | L KANG, A KEIMOWITZ, MR MUNROW, SE NOVICK   |
| Ar       | SiH4           | I    | JCP  | 100   | 7051   | 1994   | RW RANDALL, JB IBBOTSON, BJ HOWARD  |
| Ar       | SiH4           | mw   | JMSp | 197   | 232    | 1999   | Y KAWASHI, RD SUENRAM, GT FRASER, FJ LOVAS, E HIROTA  |
| Ar       | CH4            | I    | ZNAT | 51    | 997    | 1996   | I PAK, M HEPP, DA ROTH, G WINNEWISSER, KMT YAMADA   |
| Ar       | CH4            | I    | ZNAT | 53    | 725    | 1998   | I PAK, DA ROTH, ..., KMT YAMADA   |
| Ar       | CH4            | T    | JCP  | 110   | 5639   | 1999   | TGA HEIJMEN, PES WORMER, A VAN DER AVOIRD, RE MILLER, R MOSZYNSKI   |
| Ar       | CH4            | I    | JCP  | 110   | 5651   | 1999   | RE MILLER, TGA HEIJMEN, PES WORMER, A VAN DER AVOIRD, R MOSZYNSKI   |
| Ar       | CH4            | I    | JMSp | 222   | 109    | 2003   | M WANGLER, DA ROTH, I PAK, G WINEWISSER, PES WORMER, A van der AVOIRD   |
| Ar n     | CH3+           | ID   | JCP  | 108   | 10046  | 1998   | RV OLKHOV, SA NIZKORODOV, O DOPFER  |
| Ar       | CHCHONCHN      | JPC  | 99   | 12466 | 1995   | E KRAKA, D CREMER, U SPOEREL, I MERKE, W STAHL, H DREIZLER {oxazole} |   |
| Ar       | c-CHCHONCH     | JPC  | 100  | 14298 | 1996   | U SPOEREL, H DREIZLER, W STAHL, E KRAKU, D CREMER {isoxazole}        |   |
| Ar       | CHCHSCHN       | JMSt | 352  | 289   | 1995   | U KRETSCHMER, W STAHL, H DREIZLER {thiazole}                         |   |
| Ar       | c-CHCHSNCH     | mw   | BBPC | 99    | 891    | 1995   | U KRETSCHMER {isothiazole}  |
| Ar       | c-CHCHNCHNH    | mw   | CPL  | 294   | 377    | 1998   | W CAMINATI, S MELANDRI, ..., PG FAVERO {imidazole}  |
| Ar       | c-CH2OCH2OCH2  | mm   | JMSp | 184   | 145    | 1997   | A MARIS, AC FANTONI, W CAMINATI, PG FAVERO  |
| Ar       | c-C5H8O        | mw   | JPCA | 114   | 1427   | 2010   | AJ MINEI, J van WIJNGAARDEN, SE NOVICK, WC PRINGLE {cyclopentene oxide}   |
| Ar       | (CH3)2C6H2C4H4 | RTPI | JCP  | 102   | 4715   | 1995   | T DROZ, S LEUTWYLER, M MANDZIUK, Z BACIC  |
| Ar       | C10H7F         | E    | JCP  | 102   | 6432   | 1995   | BB CHAMPAGNE, JF PFANSTIEL, DW PRATT, RC ULSH {1- and 2-fluoronaphthalene}  |
| Ar       | methylpyrrole  | mw   | COL  | TB11  |        | 1995   | SR HUBER, A BAUDER  |
| Ar2      | methylpyrrole  | mw   | COL  | TB11  |        | 1995   | SR HUBER, A BAUDER  |
| Ar       | (CH3)2S        | mw   | JMSp | 257   | 11     | 2009   | Y TATAMITANI, A SATO, Y KAWASHIMA, N OHASHI, JM LOBUE, E HIROTA   |
| Ar       | (CH2)3S        | mw   | COL  | RI07  |        | 1995   | WDR PREMASIRI, DW MCCAMANT, M MUNROW, WC PRINGLE {thietane}   |
| Ar       | (CH2)3O        | mw   | COL  | RI07  |        | 1995   | WDR PREMASIRI, DW MCCAMANT, M MUNROW, WC PRINGLE {oxetane}  |
| Ar       | c-(CH2)3O      | mw   | CPL  | 286   | 272    | 1998   | F LORENZO, A LESARRI, JC LOPEZ, JL ALONSO {oxetane}   |
| Ar       | c-(CH2)3CO     | mw   | JPCA | 103   | 2256   | 1999   | MR MUNROW, WC PRINGLE, SE NOVICK {cyclobutanone}  |
| Ar       | c-C4H7Cl       | mw   | JMSt | 742   | 165    | 2005   | R SUBRAMANIAN, JM SZARKO, WC PRINGLE, SE NOVICK {chlorocyclobutane}   |
| Ar       | c-(C4H6)CH2    | mw   | JMSp | 251   | 210    | 2008   | W LIN, JA GAYLE, WC PRINGLE, SE NOVICK {methylenecyclobutane}   |
| Ar       | NaCl           | mw   | JCP  | 109   | 10539  | '98  | A MIZOGUCHI, Y ENDO, Y OHSHIMA  |
| Ar       | AgF            | mw   | JCP  | 112   | 1321   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | AgCl           | mw   | JCP  | 112   | 1321   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | AgBr           | mw   | JCP  | 112   | 1321   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | AuCl           | mw   | JACS | 122   | 6100   | 2000   | CJ EVANS, A LESARRI, MCL GERRY  |
| Ar       | CuF            | mw   | JCP  | 112   | 9363   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | CuCl           | mw   | JCP  | 112   | 9363   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | CuBr           | mw   | JCP  | 112   | 9363   | 2000   | CJ EVANS, MCL GERRY   |
| Ar       | NF3            | mw   |      |       |        | 1996   | KJ GRANT, DS McCRACKEN, MR MUNROW, SE NOVICK  |
| Ar       | C10H8          | ZEKE | CPL  | 261   | 481    | 1996   | T VONDRAK, S SATO, K KIMURA {naphthalene}   |
| Ar       | C10H8          | T    | JCPA | 105   | 10379  | '01  | E CLEMENTI, G CORONGIN(?) {naphthalene}   |
| Ar       | (CH2)3         | mw   | JCP  | 106   | 7968   | 1997   | Y XU, W JAEGER {cyclopropane}   |
| Ar       | (CH2)3         | T    | JCP  | 115   | 8431   | 2001   | TB PEDERSEN, B FERNANDEZ, H KOCH, J MAKAREWICZ {cyclopropane}   |
| Ar       | CH3CH2CH3      | mw   | JCP  | 127   | 184306 | '07  | KI PETERSON, D PULLMAN, W LIN, AJ MINEI, SE NOVICK {propane}  |
| Ar       | C6H4(CHCH2)F   | E    | JCP  | 108   | 1836   | 1998   | NM LAKIN, G PIETRAPERZIA, M BECUCCI, E CASTELLIUCCI, M CORENO, A GIARDINI-GUIDONI, A VAN DER AVOIRD {4-fluorostyrene} |
| Ar       | CHF2CH3        | mw   | CPL  | 316   | 75     | 2000   | B VELINO, S MELANDRI, ..., W CAMINATI   |
| Ar       | CH2F2          | MW   | CPL  | 316   | 81     | 2000   | JC LOPEZ, PG FAVERO, ..., W CAMINATI  |
| Ar       | CH3CH2CHOHCH3  | mw   | JMSp | 214   | 97     | 2002   | AK KING, BJ HOWARD {butan-2-ol}   |
| Ar1-3    | C15H13         | MATI | JCP  | 110   | 3389   | 1999   | JD PITTS, JL KNEE {9-ethylfluorene}   |
| Ar m     | I-ROH          | VPre | JCP  | 111   | 9593   | 1999   | SB NIELSEN, P AYOTTE, JA KELLY, MA JOHNSON {R = methyl, ethyl, isopropyl}   |
| Ar1-4    | C4H2+          | D    | JMSp |       |        | 2003   | TW SCHMIDT, T PINO, J van WIJNGAARDEN, K TIKHOMIROV, F GUTHE, JP MAIER  |
| Ar/Kr/Xe | Cr/Mo/W(CO)6   | I    | JCP  | 104   | 8292   | 1996   | GM HANSFORD, PB DAVIES  |
| Ar       | C28H18         | RCS  | JCP  | 113   | 11109  | '00  | T FUJIWARA, Y FUJIMURA, O KAJIMOTO {9-9'-bianthryl}   |

|      |                  |     |      |      |        |      |   |
|------|------------------|-----|------|------|--------|------|---|
| Ar   | HCCCN            | mw  | APPA | 104  | 415    | 2003 | O DESYANTNYK, J KOSARZEWSKI, Z KISIEL   |
| Ar   | HCCCN            | mw  | JCP  | 119  | 7749   | 2003 | A HUCKAUF, W JAEGER, P BOTSCHWINA, R OSWALD   |
| Ar   | c-C7H5OOH        | LIF | CPL  | 215  | 499    | 1993 | H SEKIYA, T NAKAJIMA, H UJITA, T TSUJI, S ITO, Y NISHIMURA {tropolone}                |
| Ar   | c-C7H5OOH        | mw  | JPCA | 113  | 13076  | '09  | W LIN, WC PRINGLE, SE NOVICK, TA BLAKE {tropolone}                                    |
| Ar   | CH3OCH3          |     | CPL  | 361  | 341    | 2002 | P OTTAVIANI, A MARIS, W CAMINATI, Y TATAMITANI, Y SUZUKI, T OGATA, JL ALONSO          |
| Ar   | CH3OCH3          | Tmw | JCP  | 124  | 094301 | '06  | Y MORITA, N OHASHI, Y KAWASHIMA, E HIROTA   |
| Ar   | CF3CN            | mw  | JMSp | 243  | 32     | 2007 | W LIN, SE NOVICK {trifluoroacetonitrile}  |
| Ar   | C6H5OH           | T   | JCP  | 128  | 114319 | '08  | J CERNY, X TONG, P HOBZA, K MULLER-DETHLEFS   |
| Ar m | CH3NO2           | Pre | JCP  | 115  | 10718  | '01  | JM WEBER, WH ROBERTSON, MA JOHNSON  |
| Kr   | Xe               | mw  | JCP  | 99   | 919    | 1993 | W JAEGER, Y XU, MCL GERRY   |
| Kr   | Ag               | E   | JCP  | 103  | 9200   | 1995 | LR BROCK, MA DUNCAN   |
| Kr   | HF               |     | CPL  | 70   | 420    | 1980 | EJ CAMPBELL, MR KEENAN, LW BUXTON, TJ BALLE, PD SOPER, AC LEGON, WH FLYGARE           |
| Kr   | HF               |     | CP   | 54   | 173    | 1981 | LW BUXTON, EJ CAMPBELL, MR KEENAN, TJ BALLE, WH FLYGARE                               |
| Kr   | HF               | I   | JCP  | 85   | 2502   | 1986 | GT FRASER, AS PINE  |
| Kr   | HF               | I   | Mar  |      |        | 1986 | ZS HUANG, KW JUCKS, RE MILLER   |
| Kr   | HF in He         | I   | JCP  | 115  | 4508   | 2001 | K NAUTA, RE MILLER  |
| Kr   | HCl              |     | JCP  | 72   | 922    | 1980 | TJ BALLE, EJ CAMPBELL, MR KEENAN, WH FLYGARE  |
| Kr   | HCl              |     | CP   | 45   | 429    | 1980 | AE BARTON, TJ HENDERSON, PRR LANGDRIDGE-SMITH, BJ HOWARD                              |
| Kr   | HCl              | eqQ | PR   | A24  | 818    | 1981 | EJ CAMPBELL, LW BUXTON, MR KEENAN, WH FLYGARE   |
| Kr   | HCl              |     | MP   | 51   | 1489   | 1984 | EJ CAMPBELL, WG READ  |
| Kr   | HCl vib ex state |     | JCP  | 98   | 2783   | 1993 | JW BEVAN, AC LEGON, CA REGO   |
| Kr   | HCl vib excited  |     | CPL  | 204  | 551    | 1993 | JW BEVAN, AC LEGON, CA REGO   |
| Kr   | HCl              | T   | MP   | 100  | 151    | 2002 | JM HUTSON, BJ HOWARD  |
| Kr   | HBr              |     | JCP  | 72   | 3070   | 1980 | MR KEENAN, EJ CAMPBELL, TJ BALLE, LW BUXTON, TK MINTON, PD SOPER, WH FLYGARE          |
| Kr   | HBr              | T   | JCP  | 91   | 4455   | 1989 | JM HUTSON   |
| Kr   | HCN              |     | JCP  | 78   | 3483   | 1983 | EJ CAMPBELL, LW BUXTON, AC LEGON  |
| Kr   | HCN ex vib       | mw  | JCP  | 103  | 493    | 1995 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Kr   | HCN              | T   | JCP  | 114  | 851    | 2001 | RR TOCZYLOWSKI, F SLAWOMIR, M CYBULSKI  |
| Kr   | ClF              |     | CJP  | 53   | 2007   | 1975 | SE NOVICK, SJ HARRIS, KC JANDA, W KLEMPERER   |
| Kr   | ClF              |     | CP   | 59   | 55     | 1981 | LW BUXTON, EJ CAMPBELL, WH FLYGARE  |
| Kr   | F2               | T   | JCP  | 109  | 10701  | '98  | GJ HOFFMAN, LA SWAFFORD, RJ CAVE  |
| Kr   | SO3              |     | JCP  | 74   | 4211   | 1981 | KR LEOPOLD, KH BOWEN, W KLEMPERER   |
| Kr   | OCS              | I   | CPL  | 118  | 12     | 1985 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE                                    |
| Kr   | OCS              |     | JCP  | 87   | 2010   | 1987 | FJ LOVAS, RD SUENRAM  |
| Kr   | OCS              | I   | JMSp | 139  | 423    | 1989 | GD HAYMAN, J HODGE, BJ HOWARD, JS MUENTER, TR DYKE                                    |
| Kr   | OCS              |     | COL  | FA7  |        | 1991 | L NEMES, SL MARUCA, AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI                           |
| Kr   | OCS dipole       |     | JMSp | 160  | 422    | 1993 | AM ANDREWS, L NEMES, SL MARUCA, KW HILLIG II, RL KUCZKOWSKI, JS MUENTER               |
| Kr   | CO2              | I   | JCP  | 88   | 6157   | 1988 | GT FRASER, AS PINE, RD SUENRAM  |
| Kr   | CO2              | mw  | JPC  | 97   | 357    | 1993 | M IIDA, Y OHSHIMA, Y ENDO   |
| Kr   | CO               | I   | JMSp | 158  | 100    | 1993 | ARW McKELLAR  |
| Kr   | CO               | mw  | JCP  | 106  | 7519   | 1997 | KA WALKER, T OGATA, W JAEGER, MCL GERRY, I OZIER                                      |
| Kr   | CO               | I   | MP   | 97   | 127    | 1999 | MD BROOKS, ARW McKELLAR   |
| Kr   | CO               | mm  | JMSp | 205  | 331    | 2001 | KA WALKER, ARW McKELLAR   |
| Kr   | CH3OH            |     | Col  |      |        | 1987 | RD SUENRAM, GT FRASER, FJ LOVAS, J ZOZOM, CW GILLES                                   |
| Kr   | C5H5N            |     | Col  |      |        | 1987 | TD KLOTS, T EMILSSON, RS RUOFF, C CHUANG, HS GUTOWSKY                                 |
| Kr   | PF3              | M   | JCP  | 90   | 6949   | 1989 | A TALEB-BENDIAB, MS LABARGE, LL LOHR, RC TAYLOR, KW HILLIG II, RL KUCZKOWSKI, RK BOHN |
| Kr   | BF3              | IM  | JCP  | 90   | 7017   | 1989 | Y MATSUMOTO, Y OHSHIMA, M TAKAMI, K KUCHITSU  |
| Kr   | C6H6             |     | JCP  | 97   | 5335   | 1992 | TD KLOTS, T EMILSSON, HS GUTOWSKY   |
| Kr   | C6H6             | E?  | CPL  | 183  | 77     | 1991 | T WEBER, E RIEDLE, HJ NEUSSER, EW SCHLAG  |
| Kr ? | C6H6             | E   | JCP  | 104  | 865    | 1996 | E RIEDLE, D SUSSMAN, TH WEBER, HJ NEUSSER   |
| Kr ? | C6H6             | E   | JCP  | 104  | 882    | 1996 | E RIEDLE, A VAN DER AVOIRD  |
| Kr   | CdCH3            | E   | COL  |      | FB11   | 1991 | AM ELLIS, ESJ ROBLES, TA MILLER   |
| Kr   | Cl2              |     | JPC  | 95   | 5058   | 1991 | CR BIELER, KE SPENCE, KC JANDA  |
| Kr   | OH               | T   | COL  | 92   | RE09   | 1992 | U SCHNUPF, JM BOWMAN, MC HEAVEN   |
| Kr   | OH               | E   | JCP  | 97   | 1655   | 1992 | S FEI, X ZHENG, MC HEAVEN   |
| Kr   | OH               | mw  | COL  | MJ04 |        | 1995 | K SATO, Y OHSIMA, Y ENDO  |
| Kr   | OH               | E   | JCP  | 110  | 1508   | 1999 | CC CARTER, TA MILLER, H-S LEE, PP KORAMBATH, AB McCOY, EF HAYES                       |
| Kr   | SH               | E   | JCP  | 107  | 3437   | 1997 | MC YANG, CC CARTER, TA MILLER   |
| Kr   | SH               | E   | JCP  | 107  | 3447   | 1997 | CC CARTER, TA MILLER  |
| Kr   | SH               | T   | JCP  | 107  | 3460   | 1997 | PP KORAMBATH, XT WU, EF HAYES, CC CARTER, TA MILLER                                   |
| Kr   | SH               | mw  | JCP  | 120  | 6935   | 2004 | K SUMA, Y SUMIYOSHI, Y ENDO   |
| Kr   | H2O              | T   | JCP  | 97   | 8181   | 1992 | G CHALASINSKI, MM SZCZESNIAK, S SCHEINER  |
| Kr   | H2O              | mw  | MP   | 98   | 1575   | 2000 | J van WIJNGAARDEN, W JAEGER   |
| Kr   | NH3              | T   | JCP  | 97   | 8181   | 1992 | G CHALASINSKI, MM SZCZESNIAK, S SCHEINER  |
| Kr   | NH3              | mw  | MP   | 99   | 1215   | 2001 | J van WIJNGAARDEN, W JAEGER   |
| Kr   | CS2              | I   |      |      |        | 1993 | TR DYKE, J CRUZAN, M WALSH  |
| Kr   | SO2              | I   |      |      |        | 1993 | TR DYKE, CA HWANG   |
| Kr   | C6H6 H2O         | mw  | JCP  | 101  | 861    | 1994 | E ARUNAN, T EMILSSON, HS GUTOWSKY   |
| Kr   | N2               | mw  | JCP  | 99   | 7510   | 1993 | W JAEGER, Y XU, N HEINEKING, MCL GERRY  |
| Kr   | AlH              | E   | JPC  | 99   | 3430   | 1995 | E HWANG, PJ DAGDIGIAN   |

|    |               |      |      |     |           |      |   |
|----|---------------|------|------|-----|-----------|------|---|
| Kr | (CH2)3        | mw   | JCP  | 106 | 7968      | 1997 | Y XU, W JAEGER  |
| Kr | CH4           | I    | ZNAT | 53  | 725       | 1998 | I PAK, DA ROTH, ..., KMT YAMADA   |
| Kr | CH4           | mw   | JCP  | 120 | 9047      | 2004 | Y LIU, W JAEGER   |
| Kr | N2O           | I    | JMSP | 189 | 235       | 1998 | AW HERREBOUT, HB QIAN, ..., BJ HOWARD   |
| Kr | NO            | RTPI | JCP  | 109 | 4361      | 1998 | P MACK, JM DYKE, DM SMITH, TG WRIGHT, H MEYER                                   |
| Kr | c-(CH2)2O     | mw   | JMSP | 215 | 73        | 2002 | B VELINO, A MILLEMAGGI, W CAMINATI {oxirane}                                    |
| Kr | c-(CHCH2)2O   | mm   | MP   | 98  | 1919      | 2000 | B VELINO, S MELANDRI, A MARIS, PG FAVERO, W CAMINATI {2,5-dihydrofuran}         |
| Kr | CH3(CHCH2O)   | mw   | PCCP | 5   | 1359      | 2003 | S BLANCO, S MELANDRI, A MARIS, W CAMINATI, B VELINO, Z KISIEL {propylene oxide} |
| Kr | HCO+          | mw   | CPL  | 331 | 184       | 2000 | K SEKI, Y SUMIYOSHI, Y ENDO   |
| Kr | AuCl          | mw   | JACS | 122 | 6100      | 2000 | CJ EVANS, A LESARRI, MCL GERRY  |
| Kr | AgCl          | mw   | JMSP | 206 | 33        | 2001 | LM REYNARD, CJ EVANS, MCL GERRY   |
| Kr | AgF           | mw   | JMSt | 612 | 109       | 2002 | NR WALKER, LM REYNARD, MCL GERRY  |
| Kr | CuF           | mw   | InC  | 43  | 3871      | 2004 | JM MICHAUD, SA COOKE, MCL GERRY   |
| Kr | CuCl          | mw   | InC  | 43  | 3871      | 2004 | JM MICHAUD, SA COOKE, MCL GERRY   |
| Kr | H2            | I    | JCP  | 122 | 084320'05 |      | ARW McKELLAR  |
| Kr | c-C7H5OOH     | LIF  | CPL  | 215 | 499       | 1993 | H SEKIYA, T NAKAJIMA, H UJITA, T TSUJI, S ITO, Y NISHIMURA {tropolone}          |
| Kr | CH3OCH3       | JCPA |      | 108 | 4224      | 2004 | B VELINO, S MELANDRI, W CAMINATI  |
| Kr | C6H2F2 {para} | TOF  | JCP  | 115 | 10709     | '01  | SM BELLM, RJ MOULDS, WD LAWRANCE  |
| Xe | Ag            | E    | JCP  | 103 | 9200      | 1995 | LR BROCK, MA DUNCAN   |
| Xe | HF            | JCP  |      | 75  | 2041      | 1981 | FA BAIOCCHI, TA DIXON, CH JOYNER, W KLEMPERER                                   |
| Xe | HF            | I    | JCP  | 85  | 2502      | 1986 | GT FRASER, AS PINE  |
| Xe | HCl           | JCP  |      | 70  | 5157      | 1979 | KV CHANCE, KH BOWEN, JS WINN, W KLEMPERER                                       |
| Xe | HCl           | JCP  |      | 73  | 3523      | 1980 | MR KEENAN, LW BUXTON, EJ CAMPBELL, TJ BALLE, WH FLYGARE                         |
| Xe | HCl           | PE   | JCP  | 94  | 4680      | 1991 | T PRADEEP, MS HEGDE, CNR RAO  |
| Xe | DCI           | eqQ  | PR   | A24 | 818       | 1981 | EJ CAMPBELL, LW BUXTON, MR KEENAN, WH FLYGARE                                   |
| Xe | HCl           | T    | MP   | 100 | 151       | 2002 | JM HUTSON, BJ HOWARD  |
| Xe | HBr           | CPL  |      | 94  | 73        | 1983 | SG KUKOLICH, EJ CAMPBELL  |
| Xe | CdCH3         | E    | COL  |     | FB11      | 1991 | AM ELLIS, ESJ ROBLES, TA MILLER   |
| Xe | C6H6          | E?   | CPL  | 183 | 77        | 1991 | T WEBER, E RIEDLE, HJ NEUSSER, EW SCHLAG  |
| Xe | C6H6          | m    | JCP  | 101 | 9736      | 1994 | TH BRUPBACHER, J MAKAREWICZ, A BAUDER   |
| Xe | Cl2           | JPC  |      | 95  | 5058      | 1991 | CR BIELER, KE SPENCE, KC JANDA  |
| Xe | Na            | E?   | JMSP | 155 | 277       | 1992 | P BRAUMANN, D ZIMMERMANN, R BRUHL   |
| Xe | CO2           | mw   | JPC  | 97  | 357       | 1993 | M IIDA, Y OHSHIMA, Y ENDO   |
| Xe | CO            | I    | JMSP | 159 | 210       | 1993 | JWC JOHNS, Z LU, ARW McKELLAR   |
| Xe | CO            | mw   | JCP  | 106 | 7519      | 1997 | KA WALKER, T OGATA, W JAEGER, MCL GERRY, I OZIER                                |
| Xe | CO            | I    | MP   | 97  | 127       | 1999 | MD BROOKS, ARW McKELLAR   |
| Xe | CO            | mm   | JMSP | 205 | 331       | 2001 | KA WALKER, ARW McKELLAR   |
| Xe | CS2           | I    |      |     |           | 1993 | TR DYKE, J CRUZAN, M WALSH  |
| Xe | Br            | E    | JCP  | 103 | 9611      | 1995 | JO CLEVINGER, J TELLINGHUISEN   |
| Xe | NO2           | mw   | CPL  | 286 | 408       | 1998 | CJ WHITHAM, RJ LOW, ..., BJ HOWARD  |
| Xe | N2O           | I    | JMSP | 189 | 235       | 1998 | AW HERREBOUT, HB QIAN, ..., BJ HOWARD   |
| Xe | NO            | RTPI | JCP  | 109 | 4361      | 1998 | P MACK, JM DYKE, DM SMITH, TG WRIGHT, H MEYER                                   |
| Xe | c-C7H5OOH     | LIF  | CPL  | 215 | 499       | 1993 | H SEKIYA, T NAKAJIMA, H UJITA, T TSUJI, S ITO, Y NISHIMURA {tropolone}          |
| Xe | N2            | mw   | JCP  | 125 | 214310'05 |      | Q WEN, W JAEGER   |
| Xe | CH4           | mw   | JCP  | 124 | 014301'06 |      | Q WEN, W JAEGER   |
| Xe | H2O           | mw   | JPCA | 110 | 7560      | 2006 | Q WEN, W JAEGER   |
| Xe | (H2O)2        | mw   | JPCA |     |           | 2006 | Q WEN, W JAEGER   |
| Xe | CH3OCH3       | CPC  |      | 4   | 881       | 2003 | LB FAVERO, B VELINO, A MILLEMAGGI, W CAMINATI                                   |
| Xe | CH3OCH3       | CPL  |      | 392 | 1         | 2004 | W CAMINATI, A MILLEMAGGI, JL ALONSO, A LESARRI, JC LOPEZ, S MATA                |
| Xe | NH3           | mw   | JCP  | 128 | 204309'08 |      | Q WEN, W JAEGER   |
| H2 | H2            | I    | JCP  | 95  | 3081      | 1991 | ARW McKELLAR, J SCHAEFER  |
| H2 | H2            | T    | JCP  | 112 | 4465      | 2000 | P DIEP, JK JOHNSON  |
| H2 | B             | E    | JCP  | 104 | 8165      | 1996 | X YANG, E HWANG, PJ DAGDIGIAN   |
| H2 | B             | T    | JCP  | 112 | 5722      | 2000 | J WILLIAMS, MH ALEXANDER  |
| H2 | CN            | E    | JCP  | 109 | 5171      | 1998 | Y CHEN, MC HEAVEN   |
| H2 | CN            | T    | JCP  | 110 | 10380     | '99  | AL KALEDIN, MC HEAVEN, JM BOWMAN  |
| H2 | Al            | E    | JCP  | 109 | 8920      | 1998 | X YANG, PJ DAGDIGIAN  |
| H2 | Al            | T    | JCP  | 112 | 5722      | 2000 | J WILLIAMS, MH ALEXANDER  |
| H2 | H2O           | I    | JCP  | 110 | 156       | 1999 | MJ WEIDA, DJ NESBITT  |
| H2 | CH4           | I    | JCP  | 110 | 9989      | 1999 | ARW McKELLAR, DA ROTH, I PAK, G WINNEWISSER                                     |
| H2 | Cl-           | I    | JCP  | 113 | 10154     | '00  | DA WILD, RL WILSON, PS WEISER, EJ BIESKE  |
| D2 | Cl-           | I&T  | JCP  | 115 | 824       | 2001 | DA WILD, PS WEISER, EJ BIESKE, A ZEHNACKER                                      |
| D2 | Br-           | I    | JCP  | 115 | 6394      | 2001 | DA WILD, PS WEISER, EJ BIESKE   |
| H2 | OCS           | I    | JCP  | 116 | 646       | 2002 | J TANG, ARW McKELLAR  |
| H2 | OCS           | mw   | JCP  | 123 | 221106'05 |      | Z YU, KJ HIGGINS, W KLEMPERER, MC McCARTHY. P THADDEUS                          |
| H2 | OCS           | mw   | JCP  | 127 | 054305'07 |      | Z YU, KJ HIGGINS, W KLEMPERER, MC McCARTHY. P THADDEUS, K LIAO, W JAEGER        |
| H2 | OCS           | mw   | MP   | 106 | 23        | 2008 | JM MICHAUD, K LIAO, W JAEGER  |
| H2 | CN            | E    | CPL  | 347 | 199       | 2001 | AL KALENDIN, MC HEAVEN  |
| H2 | HCCCN         | mw   | JPCA | 115 | 9456      | 2011 | JM MICHAUD, WC TOPIC, W JAEGER  |
| D2 | CN            | E    | CPL  | 347 | 199       | 2001 | AL KALENDIN, MC HEAVEN  |
| HF | N2            | JCP  |      | 76  | 292       | 1982 | PD SOPER, AC LEGON, WG READ, WH FLYGARE   |
| HF | N2 g-values   | JCP  |      | 78  | 6515      | 1983 | WG READ, EJ CAMPBELL  |

|    |                |          |       |     |      |      |   |
|----|----------------|----------|-------|-----|------|------|---|
| DF | N2             |          | CPL   | 109 | 502  | 1984 | AC LEGON, LC WILLOUGHBY   |
| HF | N2             | I        | JCP   | 86  | 1098 | 1987 | KW JUCKS, ZS HUANG, RE MILLER   |
| HF | N2             | I        | JCP   | 86  | 3151 | 1987 | CM LOVEJOY, DJ NESBIT   |
| HF | N2             | I        | COL   |     | WG02 | 1993 | C LUASH, JM LISY  |
| HF | N2             | I        | JPC   | 98  | 6068 | 1994 | JT FARRELL Jr, O SNEH, DJ NESBITT   |
| HF | N2 vib prediss | I        | JCP   | 105 | 4385 | 1996 | SN TSANG, C-C CHUANG, R MOLLAAGHABABA, W KLEMPERER, H-C CHANG                                 |
| HF | N2             | T        | JCP   | 104 | 5883 | 1996 | DE WOON, TH DUNNING Jr, KA PETERSON   |
| HF | CO             |          | JCP   | 73  | 583  | 1980 | AC LEGON, PD SOPER, MR KEENAN, TK MINTON, TJ BALLE, WH FLYGARE                                |
| HF | CO             |          | JCP   | 74  | 4944 | 1981 | AC LEGON, PD SOPER, WH FLYGARE  |
| HF | CO             |          | CPL   | 94  | 69   | 1983 | EJ CAMPBELL, WG READ, and ?   |
| HF | CO             | g-values | JCP   | 78  | 6515 | 1983 | WG READ, EJ CAMPBELL  |
| HF | CO             | I        | Mar   |     |      | 1986 | JW BEVAN  |
| HF | CO             | I        | JCP   | 88  | 4147 | 1988 | GT FRASER, AS PINE  |
| HF | CO             | I        | JCP   | 86  | 6637 | 1987 | KW JUCKS, RE MILLER   |
| HF | CO             | I        | JCP   | 91  | 3335 | 1989 | Z WANG, JW BEVAN  |
| HF | CO             | I        | COL   | 93  | WG02 | 1993 | C LUASH, JM LISY  |
| HF | CO diss E      | VPre     | JCP   | 113 | 4581 | 2000 | L OUDEJANS, RE MILLER   |
| HF | CO2            |          | JCP   | 74  | 6544 | 1981 | FA BAIOCCHI, TA DIXON, CH JOYNER, W KLEMPERER   |
| HF | CO2            | Zeeman   | JCP   | 79  | 614  | 1983 | JA SHEA, WG READ, EJ CAMPBELL   |
| HF | CO2            | I        | JCP   | 86  | 5337 | 1987 | CM LOVEJOY, MD SCHUDER, DJ NESBITT  |
| HF | CO2            | I        | JCP   | 90  | 1330 | 1989 | GT FRASER, AS PINE, RD SUENRAM, DC DAYTON, RE MILLER  |
| HF | CO2            |          | JCP   | 92  | 943  | 1990 | SW SHARPE, YP ZENG, C WITTIG, RA BEAUDET  |
| HF | CO2            | I        | JCP   | 93  | 7716 | 1990 | DJ NESBIT, CM LOVEJOY   |
| HF | CO2            | IT       | JCP   | 96  | 5712 | 1992 | DJ NESBIT, CM LOVEJOY   |
| HF | CO2            | T        | JCP   | 103 | 1263 | 1995 | JS MUENTER  |
| HF | CO2 distr mag  | T        | MP    | 96  | 1225 | 1999 | AD BUCKINGHAM, Y TANTIRUNGROTECHAI  |
| HF | N2O            |          | JCP   | 74  | 6550 | 1981 | CH JOYNER, TA DIXON, FA BAIOCCHI, W KLEMPERER   |
| HF | N2O            | I        | JCP   | 87  | 1450 | 1987 | CM LOVEJOY, DJ NESBITT JR   |
| HF | N2O            |          | CPL   | 141 | 12   | 1987 | SG KUKOLICH, RE BUMGARNER, DJ PAULEY  |
| HF | N2O            | I        | CPL   | 143 | 590  | 1988 | DC DAYTON, RE MILLER  |
| HF | N2O            |          | CP    | 131 | 403  | 1989 | SG KUKOLICH, DJ PAULEY  |
| HF | N2O            |          | JCP   | 90  | 3458 | 1989 | SG KUKOLICH, DJ PAULEY  |
| HF | N2O            | I        | JCP   | 90  | 4671 | 1989 | CM LOVEJOY, DJ NESBITT  |
| HF | N2O            |          | Col   |     |      | 1989 | SG KUKOLICH, DJ PAULEY, RE BUMGARNER  |
| HF | N2O            | I        | JCP   | 93  | 183  | 1990 | YP ZENG, SW SHARPE, D REIFSCHNEIDER, C WITTIG, RA BEAUDET                                     |
| HF | N2O            | mw       | JMSp  |     |      | 2003 | HO LEUNG, OM IBIDAPO, PI ABRUNA, MB BIANCHI   |
| HF | H2CO           |          | JCP   | 78  | 3509 | 1982 | FA BAIOCCHI, W KLEMPERER  |
| HF | H2CO           |          | JMSp  | 123 | 167  | 1987 | FJ LOVAS, RD SUENRAM, S ROSS, M KLOBUKOWSKI   |
| HF | C6H6           |          | JPC   | 87  | 2079 | 1983 | FA BAIOCCHI, JH WILLIAMS, W KLEMPERER   |
| HF | C2H6           |          | JCP   | 75  | 2681 | 1981 | LW BUXTON, PD ALDRICH, JA SHEA, AC LEGON, WH FLYGARE  |
| HF | NCCN           |          | JCP   | 74  | 4936 | 1981 | AC LEGON, PD SOPER, WH FLYGARE  |
| HF | NCCN           | I        | Col   |     |      | 1987 | ZS HUANG, KW JUCKS, RE MILLER   |
| HF | (CH2)3         |          | JCP   | 75  | 2681 | 1981 | LW BUXTON, PD ALDRICH, JA SHEA, AC LEGON, WH FLYGARE  |
| HF | (CH2)3         | I        | CPL   | 153 | 285  | 1988 | DC DAYTON, RE MILLER  |
| HF | C2H4           |          | JCP   | 76  | 4857 | 1982 | JA SHEA, WH FLYGARE   |
| HF | C2H4           | I        | JPC   | 92  | 46   | 1988 | ZS HUANG, RE MILLER   |
| HF | CH3CCH         |          | JCP   | 80  | 4605 | 1984 | JA SHEA, RE BUMGARNER, G HENDERSON  |
| HF | H2O            |          | JCSCC | 130 | 341  | 1975 | JW BEVAN, AC LEGON, DJ MILLEN, SC ROGERS  |
| HF | H2O            |          | PRSL  | 372 | 441  | 1980 | JW BEVAN, Z KISIEL, AC LEGON, DJ MILLEN, SC ROGERS  |
| HF | H2O            |          | PRSL  | 381 | 419  | 1982 | Z KISIEL, AC LEGON, DJ MILLEN   |
| HF | H2O            |          | CPL   | 92  | 333  | 1982 | AC LEGON, LC WILLOUGHBY   |
| HF | H2O            |          | JCP   | 78  | 2910 | 1983 | Z KISIEL, AC LEGON, DJ MILLEN   |
| HF | H2O            |          | JMSt  | 112 | 1    | 1984 | Z KISIEL, AC LEGON, DJ MILLEN   |
| HF | H2O            |          | CPL   | 117 | 543  | 1985 | G CAZZOLI, PG FAVERO, DG LISTER, AC LEGON, DJ MILLEN, Z KISIEL                                |
| HF | H2O            |          | CPL   | 135 | 303  | 1987 | AC LEGON, DJ MILLEN, HM NORTH   |
| HF | H2O            | T        | JPCA  | 105 | 1163 | 2001 | L ZHI-RU, W DI, L ZE-SHENG, H XU-RI, F-M TAO, S CHIA-CHUNG                                    |
| HF | H2O            | mm       | JMSp  | 241 | 124  | 2007 | SP BELOV, VM DEMKIN, NF ZOBOV, EN KARYAKIN, AF KRUPNOV, IN KOZIN, OL POLYANSKY, MYu TRETYAKOV |
| DF | D2O            |          | JMSt  | 131 | 201  | 1985 | Z KISIEL, AC LEGON, DJ MILLEN   |
| HF | H2S            |          | JCP   | 77  | 1166 | 1982 | R VISWANATHAN, TR DYKE  |
| HF | H2S            |          | JCP   | 81  | 20   | 1984 | LC WILLOUGHBY, AJ FILLERY-TRAVIS, AC LEGON  |
| HF | CIF            |          | JCP   | 65  | 5115 | 1976 | SE NOVICK, KC JANDA, W KLEMPERER  |
| HF | Cl2            | I        | CPL   | 212 | 298  | 1993 | PA STOCKMAN, GA BLAKE   |
| HF | HCN            |          | CPL   | 41  | 137  | 1976 | AC LEGON, DJ MILLEN, SC ROGERS  |
| HF | HCN            |          | JMSt  | 70  | 209  | 1978 | AC LEGON, DJ MILLEN, SC ROGERS  |
| HF | HCN            |          | PRSL  | 370 | 213  | 1980 | AC LEGON, DJ MILLEN, SC ROGERS  |
| HF | HCN            | R        | FDCS  | 73  | 71   | 1982 | AC LEGON, DJ MILLEN   |
| HF | HCN            |          | PRSL  | 401 | 327  | 1985 | AC LEGON, DJ MILLEN, LC WILLOUGHBY  |
| HF | HCN            | I        | CPL   | 124 | 579  | 1986 | BA WOFFORD, JW BEVAN, WB OLSON, WJ LAFFERTY   |
| HF | HCN            | I        | JCP   | 85  | 1283 | 1986 | EK KYRO, M ELIADES, AM GALLEGOS, P SHOJA-CHAGERVAND, JW BEVAN                                 |
| HF | HCN            |          | CPL   | 129 | 489  | 1986 | Z KISIEL, AC LEGON, DJ MILLEN, HM NORTH   |
| HF | HCN            | I        | JCP   | 86  | 1225 | 1987 | D BENDER, M ELIADES, DA DANZEISER, MW JACKSON, JW BEVAN                                       |
| DF | DCN            | I        | JCP   | 86  | 2518 | 1987 | MW JACKSON, BA WOFORD, JW BEVAN   |
| HF | HCN            | I        | JCP   | 87  | 4478 | 1987 | BA WOFFORD, SG LIEB, JW BEVAN   |

|    |                 |           |      |     |       |      |   |
|----|-----------------|-----------|------|-----|-------|------|---|
| HF | HCN             |           | CPL  | 141 | 493   | 1987 | AC LEGON, DJ MILLEN, LC WILLOUGHBY  |
| HF | HCN             | I         | CPL  | 143 | 181   | 1988 | DC DAYTON, RE MILLER  |
| HF | HCN             | I         | CP   | 150 | 217   | 1988 | DC DAYTON, RE MILLER  |
| HF | HCN             | I         | CPL  | 152 | 299   | 1989 | BA WOFFORD, RS RAM, A QUINONEZ, JW BEFAN, WB OLSON, WJ LAFFERTY   |
| HF | HCN             | I         | JCP  | 95  | 3980  | 1991 | A QUINONES, RS RAM, JW BEVAN  |
| HF | HCN             | I         | COL  |     | RC6   | 1991 | ERT KERSTEL, TF MENTEL, BH PATE, G SCOLES   |
| HF | HCN             | I         | JCP  | 97  | 8896  | 1992 | ERTH KERSTEL, H MEYER, KK LEHMANN, G SCOLES   |
| HF | HCN             | I         | JMSt | 413 | 167   | 1997 | AL McINTOSH, AM GALLEGOS, RR LUCCHESI, JW BEVAN   |
| HF | HCN             | I         | JCP  | 107 | 8327  | 1997 | A McINTOSH, AM GALLEGOS, RR LUCCHESI, JW BEVAN  |
| HF | HCN             | T         | JCP  | 115 | 6941  | 2001 | SAC McDOWELL  |
| HF | HNC             | T         | JCP  | 115 | 6941  | 2001 | SAC McDOWELL  |
| HF | HF              |           | JCP  | 56  | 2442  | 1972 | TR DYKE, BJ HOWARD, W KLEMPERER   |
| HF | HF              |           | JCP  | 81  | 5417  | 1984 | BJ HOWARD, TR DYKE, W KLEMPERER   |
| HF | HF              |           | JMSp | 123 | 434   | 1987 | WJ LAFFERTY, RD SUENRAM, FJ LOVAS   |
| HF | HF              | I         | JCP  | 78  | 2154  | 1983 | AS PINE, WJ LAFFERTY  |
| HF | HF              | I         | JCP  | 81  | 2939  | 1984 | AS PINE, WJ LAFFERTY, BJ HOWARD   |
| HF | HF              | I         | JCP  | 84  | 590   | 1986 | AS PINE, BJ HOWARD  |
| HF | HF              |           | JCP  | 83  | 2070  | 1985 | HS GUTOWSKY, C CHUANG, JD KEEN, TD KLOTS, T EMILSSON  |
| HF | HF              | I         | Mar  |     |       | 1986 | ZS HUANG, KW JUICKS, RE MILLER  |
| HF | HF              | T         | FDCS | 73  | 45    | 1982 | AE BARTON, BJ HOWARD  |
| HF | HF              | T         | JCP  | 85  | 6587  | 1986 | MA SPARKMAN   |
| HF | HF              | M         | JPC  | 93  | 5022  | 1989 | EL SIBERT III   |
| HF | HF              | T         | JCP  | 88  | 1786  | 1988 | GC HANCOCK, DG TRUHLAR, CE DYKSTRA  |
| HF | DF              | I         | JCP  | 91  | 633   | 1989 | GT FRASER, AS PINE  |
| HF | DF              | I         | JCP  | 104 | 9313  | 1996 | JT FARRELL Jr, MA SUHM, DJ NESBITT  |
| HF | HF              | T         | JCP  | 91  | 5154  | 1989 | PR BUNKER, T CARRINTON JR, PC GOMEZ, MD MARSHALL, M KOFRANEK, H LISCHKA, A KARPFEN                          |
| DF | DF              | T         | JCP  | 91  | 5154  | 1989 | PR BUNKER, T CARRINTON JR, PC GOMEZ, MD MARSHALL, M KOFRANEK, H LISCHKA, A KARPFEN                          |
| HF | HF              |           | JMSp | 141 | 204   | 1990 | SP BELOV, EN KARYAKIN, IN KOZIN, AF KRUPNOV, OL POLYANSKY, MYu TRETYAKOV, NF ZOBOV, RD SUENRAM, WJ LAFFERTY |
| HF | HF              | T         | JCP  | 93  | 6266  | 1990 | P JENSEN, PR BUNKER, A KARPFEN, M KOFRANEK, H LISCHKA   |
| HF | HF              | T         | CPL  | 182 | 551   | 1991 | SAC MCDOWELL, AD BUCKINGHAM   |
| HF | HF              | T         | JMSp | 148 | 385   | 1991 | P JENSEN, PR BUNKER, A KARPFEN  |
| HF | HF              |           | JMSp | 149 | 512   | 1991 | PR BUNKER, P JENSEN, A KARPFEN  |
| HF | HF              | T         | JMSp | 150 | 511   | 1991 | VC EPA, PR BUNKER   |
| HF | HF              |           | COL  | 92  | WG08  | 1992 | PR BUNKER, S ALTHORPE, D CLARY  |
| HF | HF              | I         | COL  | 92  | WG09  | 1992 | EJ BOHAC, RE MILLER   |
| HF | HF              | I         | JCP  | 97  | 5341  | 1992 | MA SUHM, JT FARRELL Jr, A MCLLROY, DJ NESBITT   |
| HF | HF              | trans mom | JCP  | 98  | 5982  | 1993 | C LAUSH, JM LISY, F HUISKEN, A KULCKE   |
| HF | HF              | nearI     | JCP  | 98  | 9266  | 1993 | HC CHANG, W KLEMPERER   |
| HF | HF              | nearI     | JCP  | 100 | 1     | 1994 | HC CHANG, W KLEMPERER   |
| HF | HF              | I         | COL  |     | WG01  | 1993 | C LAUSH, F HUISKEN, A KULCKE, JM LISY   |
| HF | HF              | T         | JCP  | 101 | 9793  | 1994 | Z LATAJKA, Y BOUTEILLER   |
| HF | DF predissoc    | T         | JCP  | 102 | 124   | 1995 | DH ZHANG, Q WU, JZH ZHANG   |
| HF | HF predissoc    | T         | JCP  | 102 | 4382  | 1995 | M VON DIRKE, Z BACIC, DH ZHANG, JZH ZHANG   |
| HF | DF dissociation |           | COL  |     | RE11  | 1994 | RJ BEMISH, M WU, EJ BOHAC, RE MILLER  |
| HF | HF phot dissoc  |           | COL  |     | RE14  | 1994 | R MOLLAAGHABABA, H CHANG, DD NELSON, W KLEMPERER  |
| HF | HF              | T         | JCP  | 102 | 2315  | 1995 | DH ZHANG, Q WU, JZH ZHANG, M VON DIRKE, Z BACIC   |
| HF | HF tunneling    | T         | CPL  | 234 | 71    | 1995 | M QUACK, MA SUHM  |
| HF | HF              | T         | JCP  | 103 | 1263  | 1995 | JS MÜENTER  |
| HF | HF              | T         | JCP  | 103 | 1498  | 1995 | R BURCL, G CHALASINSKI, R BUKOWSKI, MM SZCZESNIAK   |
| HF | HF              | T         | JCP  | 103 | 6051  | 1995 | CL COLLINS, K MORIHASHI, Y YAMAGUCHI, HF SCHAEFER III   |
| HF | HF              | T         | CPL  | 248 | 182   | 1996 | WC NECOEHEA, DG TRULAR  |
| HF | HF              | T         | JCP  | 103 | 8043  | 1995 | J LANGLET, J CAILLET, M CAFFAREL  |
| HF | HF              | I         | JCP  | 104 | 6225  | 1996 | DT ANDERSON, S DAVIS, DJ NESBITT  |
| HF | HF tunneling    | T         | JCP  | 104 | 7830  | 1996 | H-C CHANG, W KLEMPERER  |
| DF | DF              | I         | JCP  | 104 | 8197  | 1996 | S DAVIS, DT ANDERSON, JT FARRELL Jr, DJ NESBITT   |
| HF | HF              | I         | JCP  | 105 | 4488  | 1996 | DT ANDERSON, S DAVIS, DJ NESBITT  |
| DF | DF              | I         | JCP  | 105 | 6645  | 1996 | S DAVIS, DT ANDERSON, DJ NESBITT  |
| HF | HF              | T         | JMSt | 422 | 143   | 1998 | E KAPUY, C KOZMUTZA   |
| HF | HF              | T         | JCP  | 108 | 4413  | 1998 | BL GRIGORENKO, AV NEMUKHIN, VA APKARIAN   |
| HF | HF pe surface   | T         | JCP  | 108 | 10096 | 1998 | W KLOPPER, M QUACK, MA SUHM   |
| HF | HF              | T         | JCP  | 110 | 2354  | 1999 | XT WU, AB McCOY, EF HAYES {rot-vib}   |
| HF | HF              | T         | JCP  | 110 | 2365  | 1999 | XT WU, EF HAYES, AB McCOY {rot-vib}   |
| HF | HF diss         | T         | CPL  | 321 | 135   | 2000 | M MLADENOVIC, M LEWERENZ  |
| HF | HF              | T         | JCP  | 119 | 286   | 2003 | GWM VISSERS, GC GROENENBOOM, A van der AVOIRD   |
| HF | HF              | T         | JPCA | 105 | 1163  | 2001 | L ZHI-RU, W DI, L ZE-SHENG, H XU-RI, F-M TAO, S CHIA-CHUNG  |
| HF | HF              | T         | JCP  | 115 | 2926  | 2001 | C-Y PARK, Y KIM, Y KIM  |
| HF | HF-             | PE        | JCP  | 107 | 2962  | 1997 | JH HENDRICKS, HL DE CLERCQ, SA LYAPUSTINA, KH BOWEN Jr  |
| HF | HF-             | T         | JCP  | 107 | 2968  | 1997 | M GUTOWSKI, P SKURSKI   |
| HF | HF-             | T         | JPCA | 106 | 400   | 2002 | A RAUK, DA ARMSTRONG {XH HX-, X = F, Cl, Br}  |
| HF | (HF)2           | I         | JCP  | 88  | 5995  | 1987 | KD KOLENBRANDER, CE DYKSTRA, JM LISY  |
| HF | (HF)2           | T         | JCP  | 106 | 9627  | 1997 | GS TSCHUMPER, Y YAMAGUCHI, HF SCHAEFER III  |

|       |                 |        |       |     |       |      |   |
|-------|-----------------|--------|-------|-----|-------|------|---|
| HF    | (HF)2 vib       | T      | JCP   | 115 | 9781  | 2001 | X-G WANG, T CARRINGTON Jr   |
| DF    | (DF)2           | I      | JCP   | 98  | 5985  | 1993 | MA SUHM, JT FARRELL Jr, SH ASHWORTH, DJ NESBITT                           |
| DF    | (DF)2 vib       | T      | JCP   | 115 | 9781  | 2001 | X-G WANG, T CARRINGTON Jr   |
| HF    | (HF)2 -         | T      | JCP   | 107 | 9475  | 1997 | R RAMAEKERS, DMA SMITH, J SMETS, L ADAMOWICZ                              |
| HF    | (HF)3 -         | T      | JCP   | 107 | 9475  | 1997 | R RAMAEKERS, DMA SMITH, J SMETS, L ADAMOWICZ                              |
| HF    | (HF)3           | I      | JCP   | 113 | 707   | 2000 | TA BLAKE, SW SHARPE, SS XANTHEAS  |
| HF    | (HF)n           | T      | JPC   | 94  | 180   | 1990 | CE DYKSTRA  |
| HF    | (HF)n           | I      | JCP   | 103 | 5366  | 1995 | F HUISKEN, M KALOUDIS, A KULCKE, C LAUSH, JM LISY                         |
| HF    | (HF)4,5,6       | D      | JCP   | 113 | 971   | 2000 | L OUDEJANS, RE MILLER   |
| HF    | F               | T      | JCP   | 112 | 592   | 2000 | M MEUWLY, JM HUDSON   |
| HF    | C12             |        | JCP   | 77  | 1632  | 1982 | FA BAIOCCHI, TA DIXON, W KLEMPERER  |
| HF    | HCl             |        | JCP   | 67  | 5162  | 1977 | KC JANDA, JM STEED, SE NOVICK, W KLEMPERER                                |
| HF    | HCl             | I      | JCP   | 91  | 637   | 1989 | GT FRASER, AS PINE  |
| HF    | HCl phot dissoc |        | COL   |     | RE14  | 1994 | R MOLLAAGHABABA, H CHANG, DD NELSON, W KLEMPERER                          |
| HF    | C2H2            |        | JCP   | 76  | 2238  | 1982 | WG READ, WH FLYGARE   |
| HF    | C2H2            | I      | JCP   | 86  | 6059  | 1986 | ZS HUANG, RE MILLER   |
| HF    | C2H2            | I      | JCP   | 90  | 1478  | 1989 | ZS HUANG, RE MILLER   |
| HF    | C2H2            | IT     | JCP   | 110 | 197   | 1999 | DT MOORE, L OUDEJANS, RE MILLER   |
| HF    | C2H2            | D      | JCP   | 110 | 209   | 1999 | L OUDEJANS, DT MOORE, RE MILLER   |
| HF    | CH3CN           |        | PRSL  | 370 | 239   | 1980 | JW BEVAN, AC LEGON, DJ MILLEN, SC ROGERS                                  |
| HF    | CH3CN           |        | JMSt  | 67  | 29    | 1980 | AC LEGON, DJ MILLEN, SC ROGERS  |
| HF    | CH3CN           |        | JPC   | 85  | 3440  | 1981 | PD SOPER, AC LEGON, WG READ, WH FLYGARE                                   |
| HF    | CH3CN           | T      | FT2   | 82  | 1189  | 1986 | P COPE, DJ MILLEN, AC LEGON   |
| HF    | CH3CN           |        | FT2   | 82  | 1197  | 1986 | P COPE, DJ MILLEN, LC WILLOUGHBY, AC LEGON                                |
| HF    | CH3CN           |        | JCP   | 86  | 2530  | 1987 | AC LEGON, DJ MILLEN, HM NORTH   |
| HF    | (CH3)3CCN       |        | PRSL  | 370 | 257   | 1980 | AS GEORGIOU, AC LEGON, DJ MILLEN  |
| HF    | Kr              |        | CP    | 54  | 173   | 1981 | LW BUXTON, EJ CAMPBELL, MR KEENAN, TJ BALLE, WH FLYGARE                   |
| HF    | PH3             |        | CP    | 74  | 127   | 1983 | AC LEGON, LC WILLOUGHBY   |
| HF    | PH3             | R      | JPC   | 87  | 2064  | 1983 | AC LEGON  |
| HF    | OCS             | Zeeman | JCP   | 79  | 614   | 1983 | JA SHEA, WG READ, EJ CAMPBELL   |
| HF    | OCS             |        | JMSt  | 131 | 159   | 1985 | AC LEGON, LC WILLOUGHBY   |
| HF    | OCS             | I      | JCP   | 90  | 1330  | 1989 | GT FRASER, AS PINE, RD SUENRAM, DC DAYTON, RE MILLER                      |
| HF    | OCS             | I      | COL   | 93  | WG03  | 1993 | TA HU, SW SHARPE  |
| HF    | NH3             | mw     | JACS  | 125 | 13850 | '03  | SW HUNT, KJ HIGGINS, MB CRADDOCK, CS BRAUER, KR LEOPOLD                   |
| (HF)2 | NH3             | mw     | JACS  | 125 | 13850 | '03  | SW HUNT, KJ HIGGINS, MB CRADDOCK, CS BRAUER, KR LEOPOLD                   |
| HF    | (CH2)2O         |        | JMSt  | 69  | 69    | 1980 | AS GEORGIOU, AC LEGON, DJ MILLEN  |
| HF    | (CH2)2O         |        | PRSL  | 373 | 511   | 1981 | AS GEORGIOU, AC LEGON, DJ MILLEN  |
| HF    | c-(CH2)4O       | mw     | JCP   | 113 | 2760  | 2000 | JL ALONZO, JC LOPEZ, S BLANCO, A LESARRI, FJ LORENZO {tetrahydrofuran}    |
| HF    | SO2             |        | CPL   | 123 | 4     | 1986 | AJ FILLERY-TRAVIS, AC LEGON   |
| HF    | SO2             |        | JCP   | 85  | 3180  | 1986 | AJ FILLERY-TRAVIS, AC LEGON   |
| HF    | HI              |        | JCP   | 86  | 1083  | 1987 | RE BUMGARNER, SG KUKOLICH   |
| HF    | B2H6            |        | JCP   | 85  | 683   | 1986 | HS GUTOWSKY, T EMILSSON, JD KEEN, TD KLOTS, C CHUANG                      |
| HF    | H2              | I      | JCP   | 87  | 5629  | 1987 | KW JUCKS, RE MILLER   |
| HF    | H2              | I      | JCP   | 87  | 5621  | 1987 | CM LOVEJOY, DD NELSON Jr, DJ NESBITT                                      |
| HF    | D2              | I      | JCP   | 89  | 7180  | 1988 | CM LOVEJOY, DD NELSON Jr, DJ NESBITT                                      |
| HF    | H2              | T      | JCP   | 93  | 6334  | 1990 | DC CLARY, PJ KNOWLES  |
| HF    | H2              | D      | JCP   | 98  | 2604  | 1993 | EJ BOHAC, RE MILLER   |
| HF    | D2              | D      | JCP   | 98  | 2604  | 1993 | EJ BOHAC, RE MILLER   |
| HF    | HCCCN           |        | PRSL  | 394 | 387   | 1984 | K GEORGIOU, AC LEGON, DJ MILLEN, HM NORTH, LC WILLOUGHBY                  |
| HF    | HCCCN           |        | JCP   | 86  | 2530  | 1987 | AC LEGON, DJ MILLEN, HM NORTH   |
| HF    | HCCCN           | I      | JCP   | 99  | 760   | 1993 | X YANG, EARTH KERSTEL, G SCOLES   |
| HF    | (CH2CH)2O       |        | JMSt  |     |       | 1988 | RA COLLINS, DJ MILLEN, AC LEGON   |
| HF    | CH2CCH2         | I      | JPC   | 92  | 46    | 1988 | ZS HUANG, RE MILLER   |
| HF    | CH2CCH2         |        | CPL   | 143 | 214   | 1988 | AC LEGON, LC WILLOUGHBY   |
| HF    | CH2CCH          | M      | CPL   | 176 | 446   | 1991 | Z KISIEL, PW FOWLER, AC LEGON   |
| HF    | NO              | I      | JCP   | 93  | 2992  | 1990 | WM FAWZY, GT FRASER, JT HOUGEN, AS PINE                                   |
| HF    | NO              | mw     | CPL   | 282 | 421   | 1998 | CR DENNIS, CJ WHITHAM, R LOW, BJ HOWARD                                   |
| HF    | NO              | T      | JCP   | 115 | 1355  | 2001 | CR DENNIS, CJ WHITHAM, BJ HOWARD  |
| HF    | NO              | mw     | JCP   | 115 | 1367  | 2001 | CR DENNIS, CJ WHITHAM, BJ HOWARD  |
| HF    | (CH3)3N         | M      | CPL   | 154 | 468   | 1989 | AC LEGON, CA REGO   |
| HF    | HCH             | thermo | JCSFT | 87  | 443   | 1991 | SLA ADEBAYO, AC LEGON, DJ MILLEN  |
| HF    | CH3CN           | thermo | JCSFT | 87  | 443   | 1991 | SLA ADEBAYO, AC LEGON, DJ MILLEN  |
| HF    | HC2CN           | thermo | JCSFT | 87  | 443   | 1991 | SLA ADEBAYO, AC LEGON, DJ MILLEN  |
| HF    | (CH3)3CCN       | thermo | JCSFT | 87  | 443   | 1991 | SLA ADEBAYO, AC LEGON, DJ MILLEN  |
| HF    | H2O             | thermo | JCSFT | 87  | 443   | 1991 | SLA ADEBAYO, AC LEGON, DJ MILLEN  |
| HF    | BF3             | mw     | JACS  | 117 | 12549 | 1995 | JA PHILLIPS, M CANAGARATNA, H GOODFRIEND, A GRUSHOW, J ALMLOF, KR LEOPOLD |
| HF    | CH4             | mw     | CPL   | 173 | 107   | 1990 | AC LEGON, BP ROBERTS, AL WALLWORK   |
| HF    | CH2C3H4         | mw     | CPL   | 232 | 187   | 1995 | Z KISIEL, PW FOWLER, AC LEGON {methylenecyclopropane}                     |
| HF    | SO3             | mw     | JMSp  | 192 | 338   | 1998 | M CANAGARATNA, JA PHILLIPS, H GOODFRIEND, KR LEOPOLD                      |
| HF    | c-(CH2)4S       | mw     | CPL   | 288 | 760   | 1998 | ME SANZ, JC LOPEZ, ..., JL ALONSO {tetrahydrothiophene}                   |
| HF    | c-(CH)4S        | mw     | CPL   | 291 | 269   | 1998 | SA COOKE, GK CORLETTE, ..., AC LEGON {thiophene}                          |
| HF    | (CH3)2O         | I      | CP    | 256 | 195   | 2000 | P AUSSELIN, P SOULARD, ..., JP PERCHARD {dimethylether}                   |
| HF    | c-(CH2)3O       | mw     | CPL   | 342 | 31    | 2001 | MESANZ, VM SANZ, JC LOPEZ, JL ALONSO {oxetane}                            |

|        |                 |          |       |     |      |      |   |
|--------|-----------------|----------|-------|-----|------|------|---|
| HF     | CH3OCH3         | mw       | CPC   | 5   | 336  | 2004 | P OTTAVIANI, A MARIS, W CAMINATI, J ALONSO {dimethylether}  |
| HF     | CIFCCH2         | mw       | JMSp  |     |      | 2011 | HO LEUNG, MD MARSHALL, AT BOZZI, PM COHEN, M LAM {1chloro1fluoroethylene}                                     |
| HCl    | N2              |          | JCP   | 79  | 57   | 1983 | RS ALTMAN, MD MARSHALL, W KLEMPERER   |
| DCI    | N2              |          | CPL   | 149 | 57   | 1988 | NW HOWARD, AC LEGON   |
| HCl    | N2              | I        | JMSp  | 161 | 542  | 1993 | ARW MCKELLAR, Z LU  |
| DCI    | N2              | I        |       |     |      | 1994 | YP ZENG, RA BEAUDET   |
| HCl    | N2              | I        | MP    | 91  | 123  | 1997 | M BROQUIER, M CHEVALIER, A PICARD-BERSELLINI  |
| HCl    | N2              | mw       | CPL   | 276 | 202  | 1997 | Z KISIEL, L PSZCZOLKOWSKI, PW FOWLER, AC LEGON  |
| HCl    | CO              |          | JCP   | 73  | 583  | 1980 | AC LEGON, PD SOPER, MR KEENAN, TK MINTON, TJ BALLE, WH FLYGARE  |
| HCl    | CO              |          | JCP   | 74  | 2138 | 1981 | PD SOPER, AC LEGON, WH FLYGARE  |
| HCl    | CO              | g-values | JCP   | 78  | 6515 | 1983 | WG READ, EJ CAMPBELL  |
| HCl    | CO              |          | JCP   | 79  | 52   | 1983 | RS ALTMAN, MD MARSHALL, W KLEMPERER   |
| HCl    | CO              |          | CPL   | 161 | 6    | 1989 | Z WANG, M ELIADER, JW BEVAN   |
| HCl    | CO              | I        | JMSp  | 161 | 542  | 1993 | ARW MCKELLAR, Z LU  |
| DCI    | CO              | I        |       |     |      | 1994 | YP ZENG, RA BEAUDET   |
| HCl    | CO2             |          | JCP   | 77  | 4344 | 1982 | RS ALTMAN, MD MARSHALL, W KLEMPERER   |
| HCl    | CO2             | Zeeman   | JCP   | 79  | 614  | 1983 | JA SHEA, WG READ, EJ CAMPBELL   |
| HCl    | CO2             |          | JCP   | 92  | 943  | 1990 | SW SHARPE, YP ZENG, C WITTIG, RA BEAUDET  |
| HCl    | CO2             | T        | JCP   | 103 | 1263 | 1995 | JS MUENTER  |
| HCl    | CO2             | I        | JCP   | 105 | 8515 | 1996 | L OUDEJANS, D OLSON, RE MILLER  |
| HCl    | OCS             |          | FT2   | 81  | 1709 | 1985 | EJ GOODWIN, AC LEGON  |
| HCl    | OCS             | I        | COL   | 93  | WG03 | 1993 | TA HU, SW SHARPE  |
| HCl    | OCS             | I        | JCP   | 105 | 8515 | 1996 | L OUDEJANS, D OLSON, RE MILLER  |
| HCl    | C2H2            |          | JCP   | 75  | 625  | 1981 | AC LEGON, PD ALDRICH, WH FLYGARE  |
| HCl    | C2H2            | ID       | JCP   | 96  | 8616 | 1992 | Y RUDICH, R NAAMAN  |
| HCl    | C2H2            | IT       | JCP   | 113 | 4876 | 2000 | P CARACABAL, M BROQUIER, P MILLIE   |
| HCl    | C2H4            |          | JCP   | 75  | 2126 | 1981 | PD ALDRICH, AC LEGON, WH FLYGARE  |
| HCl    | C2H4            |          | JCP   | 79  | 1105 | 1983 | SG KUKOLICH, PD ALDRICH, WG READ, EJ CAMPBELL   |
| HCl    | C6H6            |          | JCP   | 78  | 3501 | 1983 | WG READ, EJ CAMPBELL, G HENDERSON   |
| HCl    | C6H6            |          | JACS  | 103 | 7670 | 1981 | WG READ, EJ CAMPBELL, G HENDERSON, WH FLYGARE   |
| HCl    | C6H6            | ED       | JCP   | 93  | 6977 | 1990 | AJ GOTCH, TS ZWIER  |
| HCl    | C6H5CH3         | ED       | JCP   | 93  | 6977 | 1990 | AJ GOTCH, TS ZWIER  |
| HCl    | (CH)4O          |          | JACS  | 104 | 4999 | 1982 | JA SHEA, SG KUKOLICH  |
| HCl    | (CH)4O          |          | JCP   | 78  | 3545 | 1983 | JA SHEA, SG KUKOLICH  |
| HCl    | (CH2)2O         |          | JCP   | 97  | 3050 | 1992 | AC LEGON, CA REGO, AL WALLWORK {oxirane}  |
| HCl    | (CH2)2S         |          | CP    | 198 | 119  | 1995 | CM EVANS, AC LEGON {thiirane}   |
| HCl    | (CHCH2)2O       | mw       | CPL   | 227 | 472  | 1994 | AC LEGON, JC THORN {2,5-dihydrofuran}   |
| HCl    | c-(CH2)3O       | mw       | CPL   | 323 | 130  | 2000 | S ANTOLINEZ, JC LOPEZ, JL ALONSO {cyclobutanone}  |
| HCl    | c-(C5H8)O       | mw       | CEJ   | 6   | 3345 | 2000 | S ANTOLINEZ, A LESARRI, JC LOPEZ, JL ALONSO {cyclopentene oxide}  |
| HCl    | c-(C6H10)O      | mw       | JMSt  | 780 | 57   | 2006 | R SANCHEZ, S BLANCO, JC LOPEZ, JL ALONSO {cyclohexene oxide}  |
| HCl    | Hg              |          | JCP   | 79  | 4082 | 1983 | EJ CAMPBELL, JA SHEA  |
| HCl    | Hg              |          | JCP   | 81  | 5326 | 1984 | JA SHEA, EJ CAMPBELL  |
| HCl    | (CH2)3          |          | JACS  | 102 | 7584 | 1980 | AC LEGON, PD ALDRICH, WH FLYGARE  |
| HCl    | (CH2)3          |          | JACS  | 104 | 1486 | 1982 | AC LEGON, PD ALDRICH, WH FLYGARE  |
| HCl    | (CH2)3          |          | JACS  | 105 | 5569 | 1983 | PD ALDRICH, SG KUKOLICH, EJ CAMPBELL, WG READ   |
| HCl    | (CH2CH2CH)CH3   |          | JPC   | 98  | 2050 | 1994 | SE FOREST, AM ANDREWS, RL KUCZKOWSKI {methylcyclopropane}   |
| HCl    | (CH2CH2CH)CH3 I |          | JPCA  | 105 | 9058 | 2001 | GP EVERAERT, WA HERREBOUT, BJ van der VEKEN {methylcyclopropane}  |
| HCl    | PH3             |          | JCSCC |     | 997  | 1982 | AC LEGON, LC WILLOUGHBY   |
| HCl    | H2O             |          | CPL   | 95  | 449  | 1983 | AC LEGON, LC WILLOUGHBY   |
| HCl    | H2O             | T        | JPCA  | 105 | 8323 | 2001 | GM CHABAN, RB GERBER, KC JANDA  |
| (HCl)2 | (H2O)2          | T        | JPCA  | 105 | 8323 | 2001 | GM CHABAN, RB GERBER, KC JANDA  |
| HCl    | (H2O)n n=1-5    | T        | JCP   | 109 | 973  | 1998 | S RE, Y OSAMURA, Y SUZUKI, HF SCHAEFER III  |
| HCl    | (H2O)2 dipole   | mw       | CPL   | 325 | 523  | 2000 | Z KISIEL, J KOSAREWSKI, BA PIETREWICZ, L PSZCZOLKOWSKI  |
| HCl    | (H2O)2          | mw       | JCP   | 112 | 5767 | 2000 | Z KISIEL, E BIALKOWSKA-JAWORSKA, L PSZCZOLKOWSKI, A MILET, C STRUNIEWICZ, R MOSZYNSKI, J SADLEJ {noted twice} |
| HCl    | (H2O)2 tunn     | T        | CPL   | 343 | 588  | 2001 | C STRUNIEWICZ, T KORONA, R MOSZYNSKI, A MILET   |
| HCl    | (H2O)2 vib-rot  | T        | JCP   | 115 | 3604 | 2001 | PES WORMER, GC GROENENBOOM, A VANDERAVOIRD  |
| HCl    | (H2O)2          | T        | CP    | 271 | 267  | 2001 | A MILET, C STRUNIEWICZ, R MOSZYNSKI, J SADLEJ, Z KISIEL, E BAILKOWSKA-JAWORSKA, L PSZCZOLKOWSKI               |
| HCl    | CH3OH           |          | CPL   | 112 | 59   | 1984 | P COPE, AC LEGON, DJ MILLEN   |
| HCl    | CH3OH           | mw       | JMSt  | 356 | 105  | 1995 | XQ TAN, II IOANNOU, RL KUCZKOWSKI   |
| HCl    | CH3OCH3         | I        | CPL   | 268 | 265  | 1997 | P ASSELIN, B DUPUIS, JP PERCHARD, P SOULARD   |
| HCl    | CH3OCH3         | I        | CP    | 249 | 73   | 1999 | P ASSELIN, P SOULARD, ..., JP PERCHARD  |
| HCl    | CH3OCH3         | mm       | CPL   | 394 | 262  | 2004 | P OTTAVIANI, W CAMINATI, B VELINO, JC LOPEZ   |
| HCl    | HCl             | I        | JCP   | 81  | 73   | 1984 | N OHASHI, AS PINE   |
| HCl    | HCl             | I        | JCP   | 84  | 590  | 1986 | AS PINE, BJ HOWARD  |
| HCl    | HCl             | I        | JCP   | 89  | 6577 | 1988 | GA BLAKE, KL BUSAROW, RC COHEN, KB LAUGHLIN, YT LEE, RJ SAYKALLY  |
| HCl    | HCl             | I?       | CPL   | 153 | 291  | 1988 | A FURLAN, S WOLFERT, S LEUTWYLER  |
| HCl    | HCl             | I        | JCP   | 91  | 4418 | 1989 | MD SCHUDER, CM LOVEJOY, DD NELSON JR., DJ NESBITT   |
| DCI    | DCI             | I        | JCP   | 91  | 4418 | 1989 | MD SCHUDER, CM LOVEJOY, DD NELSON JR., DJ NESBITT   |
| HCl    | HCl             | I        | JCP   | 91  | 7300 | 1989 | GA BLAKE, RE BUMGARNER  |
| HCl    | DCI             | I        | JCP   | 100 | 7250 | 1994 | MD SCHUDER, DJ NESBITT  |
| HCl    | HCl             | T        | CP    | 149 | 299  | 1991 | A KARPEN, PR BUNKER, P JENSEN   |
| HCl    | HCl             | T        | CPL   | 180 | 594  | 1991 | P JENSEN, MD MARSHALL, PR BUNKER, A KARPEN  |

|                    |  |          |      |       |      |       |       |   |
|--------------------|--|----------|------|-------|------|-------|-------|---|
| HCl                | HCl  |          | T    | JMSp  | 146  | 200   | 1991  | PR BUNKER, VC EPA, P JENSEN, A KARPFEN                                |
| HCl                | HCl  |          | T    | JMSp  | 166  | 354   | 1994  | PC GOMEZ, PR BUNKER, A KARPFEN, H LISCHKA                             |
| HCl                | HCl  |          | I    | JCP   | 99   | 4346  | 1993  | MD SCHUDER, CM LOVEJOY, R LASCOLA, DJ NESBITT                         |
| DCI                | DCI  | near     | I    | JCP   | 99   | 5045  | 1993  | MJ SCHUDER, DD NELSON Jr, DJ NESBITT                                  |
| HCl                | HCl  |          | I    | JCP   | 101  | 4593  | 1994  | RF MEADS, AL MCINTOSH, JI ARNO, CL HARTZ, RR LUCCHESI, JW BEVAN       |
| HCl                | DCI  |          | mw   | MP    |      |       | 1995  | BJ HOWARD   |
| HCl                | HCl  | dynamics | T    | JCP   | 103  | 921   | 1995  | MJ ELROD, RJ SAYKALLY   |
| HCl                | HCl  | PES fit  | T    | JCP   | 103  | 933   | 1995  | MJ ELROD, RJ SAYKALLY   |
| HCl                | HCl  |          | T    | JCP   | 103  | 950   | 1995  | FM TAO, W KLEMPERER   |
| HCl                | HCl  |          | T    | JCP   | 103  | 1263  | 1995  | JS MUENTER  |
| HCl                | HCl  |          | T    | JCP   | 106  | 2158  | 1997  | Y QIU, Z BACIC  |
| HCl                | HCl  |          | T    | CP    | 220  | 63    | 1997  | AW MEREDITH, LMING, S NORDHOLM  |
| HCl                | HCl  |          | I    | JCP   | 108  | 9614  | 1998  | K LIU, M DULLIGAN, I BEZEL, A KOLESOV, C WITTIG                       |
| HCl                | HCl  |          | T    | JCP   | 108  | 4808  | 1998  | Y QIU, JZH ZHANG, Z BACIC   |
| HCl                | HCl  |          | T    | JCP   | 108  | 8870  | 1998  | X SUN, WH MILLER  |
| HCl                | HCl  | focusing |      | JCP   | 110  | 355   | 1999  | K IMURA, T KASAI, H OHYAMA, R NAAMAN                                  |
| HCl                | HCl  | dipole   | T    | JCP   | 110  | 359   | 1999  | R NAAMAN, Z VAGER   |
| HCl                | HCl  |          | VPre | JCP   | 113  | 3055  | 2000  | H NI, JM SERAFIN, JJ VALENTINI  |
| HCl                | (HCl) <sub>2</sub>                               |          | I    | JCP   | 100  | 7101  | 1994  | J HAN, Z WANG, AL MCINTOSH, RR LUCCHESI, JW BEVAN                     |
| HCl                | H <sub>2</sub> S                                 |          |      | FT2   | 80   | 51    | 1984  | EJ GOODWIN, AC LEGON  |
| HCl                | SO <sub>2</sub>                                  |          |      | CPL   | 123  | 4     | 1986  | AJ FILLERY-TRAVIS, AC LEGON   |
| HCl                | BF <sub>3</sub>                                  |          |      | JCP   | 85   | 4261  | 1986  | JM LOBUE, JK RICE, TA BLAKE, SE NOVICK                                |
| HCl                | H <sub>2</sub> CO                                |          |      | JMSp  | 126  | 200   | 1987  | GT FRASER, CW GILLES, J ZOZOM, FJ LOVAS, RD SUENRAM                   |
| HCl                | H <sub>2</sub> CO                                |          | mw   | JCSFT | 92   | 2677  | 1996  | AC LEGON  |
| HCl                | HCN  |          |      | JCP   | 76   | 2267  | 1982  | AC LEGON, EJ CAMPBELL, WH FLYGARE                                     |
| HCl                | HCN  |          |      | CP    | 76   | 225   | 1983  | EJ CAMPBELL, SG KUKOLICH  |
| HCl                | HCN  |          | I    | Mar   |      |       | 1986  | JW BEVAN  |
| HCl                | HCN  |          | I    | JMSp  | 147  | 359   | 1991  | PA BLOCK, RE MILLER   |
| HCl                | NH <sub>3</sub>                                  |          |      | CPL   | 131  | 319   | 1986  | EJ GOODWIN, NW HOWARD, AC LEGON                                       |
| HCl                | NH <sub>3</sub>                                  |          |      | JCP   | 88   | 4694  | 1988  | NW HOWARD, AC LEGON   |
| HCl                | NH <sub>3</sub>                                  |          | T    | JPCA  | 105  | 8323  | 2001  | GM CHABAN, RB GERBER, KC JANDA  |
| (HCl) <sub>2</sub> | (NH <sub>3</sub> ) <sub>2</sub>                  |          | T    | JPCA  | 105  | 8323  | 2001  | GM CHABAN, RB GERBER, KC JANDA  |
| HCl                | B <sub>2</sub> H <sub>6</sub>                    |          |      | JCP   | 95   | 1552  | 1991  | C CHUANG, TD KLOTS, RS RUOFF, T EMILSSON, HS GUTOWSKY                 |
| HCl                | CH <sub>3</sub> CN                               |          |      | JPC   | 91   | 5210  | 1987  | AC LEGON, DJ MILLEN, HM NORTH   |
| HCl                | CH <sub>3</sub> CN                               |          | I    | JPC   | 95   | 660   | 1991  | L BALLARD, G HENDERSON  |
| HCl                | CH <sub>3</sub> CN                               |          | T?   | JPC   | 95   | 5387  | 1991  | JE DELBENE, HD METTEE, I SHAVITT                                      |
| HCl                | CH <sub>3</sub> NC                               |          |      | JACS  | 114  | 8177  | 1992  | AC LEGON, DG LISTER, HE WARNER  |
| HCl                | CH <sub>3</sub> NH <sub>2</sub>                  |          |      | JCSFT | 89   | 1173  | 1993  | AC LEGON, CA REGO   |
| HCl                | N(CH <sub>3</sub> ) <sub>3</sub>                 |          | M    | JCP   | 90   | 6867  | 1989  | AC LEGON, CA REGO   |
| HCl                | P(CH <sub>3</sub> ) <sub>3</sub>                 |          | M    | JCSFT | 86   | 1915  | 1990  | AC LEGON, CA REGO   |
| HCl                | N <sub>2</sub> O                                 |          | IM   | JCP   | 93   | 183   | 1990  | YP ZENG, SW SHARPE, D REIFSCHNEIDER, C WITTIG, RA BEAUDET             |
| HCl                | N <sub>2</sub> O                                 |          | m    | JCP   | 94   | 899   | 1991  | DJ PAULEY, MA ROEHRIG, L ADAMOWICZ, JC SHEA, ST HAUBRICH, SG KUKOLICH |
| HCl                | N <sub>2</sub> O                                 |          | mw   | JCP   | 121  | 237   | 2004  | HO LEUNG, WT CASHION, KK DUCAN, CL HAGAN, S JOO                       |
| HCl                | CH <sub>4</sub>                                  |          | mw   | CPL   | 173  | 107   | 1990  | AC LEGON, BP ROBERTS, AL WALLWORK                                     |
| HCl                | CH <sub>4</sub>                                  |          | M    | JCP   | 93   | 6256  | 1990  | Y OHSHIMA, Y ENDO   |
| HCl                | CH <sub>2</sub> CHCCH                            |          | M    | JCP   | 93   | 6249  | 1990  | Z KISIEL, PW FOWLER, AC LEGON, D DEVANNE, P DIXNEUF                   |
| HCl                | (CH <sub>2</sub> ) <sub>2</sub> CCH <sub>2</sub> |          | mw   | JCP   | 101  | 4635  | 1994  | Z KISIEL, PW FOWLER, AC LEGON   |
| HCl                | CH <sub>2</sub> CHF                              |          | M    | JCP   | 93   | 3054  | 1990  | Z KISIEL, PW FOWLER, AC LEGON   |
| HCl                | CH <sub>2</sub> CF <sub>2</sub>                  |          |      | JCSFT | 88   | 3385  | 1992  | AC LEGON, JC THORN  |
| HCl                | CH <sub>2</sub> CHCH <sub>2</sub> F              |          | IT   | JPCA  | 104  | 5222  | 2000  | Z ARP, WAHERREBOUT, ..., BJ van der VERKEN {3-fluoropropene}          |
| HCl                | SO <sub>3</sub>                                  |          | mw   | JMSp  | 192  | 338   | 1998  | M CANAGARATNA, JA PHILLIPS, H GOODFRIEND, KR LEOPOLD                  |
| DCI                | O <sub>2</sub>                                   |          | I    | ?     | ?    | ?     | 1994? | YS LIN, RA BEAUDET  |
| HCl                | H <sub>2</sub>                                   |          | IT   | COL   | TL03 |       | 1995  | DT ANDERSON, M SCHUDER, DJ NESBITT                                    |
| HCl                | ClO  |          | T    | CP    | 219  | 201   | 1997  | S ALOISIO, JS FRANCISCO   |
| HCl                | NO   |          | IT   | CP    | 237  | 265   | 1998  | L KRIM, ME ALIKHANI   |
| HCl                | c-C <sub>6</sub> H <sub>10</sub> O               |          | mw   | JMSt  | 780  | 57    | 2006  | R SANCHEZ, S BLANCO, JC LOPEZ, JL ALONSO {cyclohexene oxide}          |
| HBr                | CO   |          |      | JCP   | 73   | 583   | 1980  | AC LEGON, PD SOPER, MR KEENAN, TK MINTON, TJ BALLE, WH FLYGARE        |
| HBr                | CO   |          |      | PNAS  | 77   | 5583  | 1980  | MR KEENAN, TK MINTON, AC LEGON, TJ BALLE, WH FLYGARE                  |
| HBr                | CO   |          | I    | CPL   | 167  | 49    | 1990  | Z WANG, JW BEVAN  |
| HBr                | HBr  |          | T    | JCP   | 103  | 1263  | 1995  | JS MUENTER  |
| HBr                | DBr  |          | mw   | JCP   | 106  | 6240  | 1997  | W CHEN, AR HIGHT WALKER, SE NOVICK, F-M TAO                           |
| HBr                | HBr  |          | IT   | JCP   | 120  | 10426 | '04   | J CASTILLO-CHARA, AL MCINTOSH, Z WANG, RR LUCCHESI, JW BEVAN          |
| HBr                | PH <sub>3</sub>                                  |          |      | JCSCT | 997  | 97    | 1982  | AC LEGON, LC WILLOUGHBY   |
| HBr                | PH <sub>3</sub>                                  |          |      | JPC   | 87   | 2085  | 1983  | LC WILLOUGHBY, AC LEGON   |
| HBr                | HCN  |          |      | JCP   | 78   | 3494  | 1982  | EJ CAMPBELL, AC LEGON, WH FLYGARE                                     |
| DBr                | HCN  |          |      | CPL   | 140  | 315   | 1987  | AC LEGON  |
| HBr                | HCN  |          | I    | JMSp  | 147  | 359   | 1991  | PA BLOCK, RE MILLER   |
| HBr                | H <sub>2</sub> S                                 |          |      | JMSt  | 145  | 261   | 1986  | AI JAMAN, AC LEGON  |
| HBr                | NH <sub>3</sub>                                  |          |      | JCP   | 86   | 6722  | 1987  | NW HOWARD, AC LEGON   |
| HBr                | H <sub>2</sub> O                                 |          | M    | CPL   | 150  | 153   | 1988  | AC LEGON, AP SUCKLEY  |
| HBr                | (H <sub>2</sub> O) <sub>2</sub>                  | dipole   | mw   | CPL   | 325  | 523   | 2000  | Z KISIEL, J KOSAREWSKI, BA PIETREWICZ, L PSZCZOLKOWSKI                |
| HBr                | N <sub>2</sub>                                   |          | M    | JCP   | 90   | 672   | 1989  | NW HOWARD, AC LEGON   |
| HBr                | N <sub>2</sub>                                   |          | mw   | APPA  | 101  | 231   | 2002  | Z KISIEL, BA PIETREWICZ, L PSZCZOLKOWSKI                              |
| HBr                | N(CH <sub>3</sub> ) <sub>3</sub>                 |          | M    | JCP   | 92   | 6397  | 1990  | AC LEGON, AL WALLWORK, CA REGO  |

|     |                |           |       |      |        |      |  |
|-----|----------------|-----------|-------|------|--------|------|--|
| HBr | CO2            | M         | JCP   | 92   | 943    | 1990 | SW SHARPE, YP ZENG, C WITTIG, RA BEAUDET                                     |
| HBr | CO2            | I         | JCP   | 97   | 5392   | 1992 | YP ZENG, SW SHARPE, SK SHIN, C WITTIG, RA BEAUDET                            |
| HBr | CO2            |           | Col   |      |        | 1990 | JK RICE, RD SUENRAM, FJ LOVAS, GT FRASER, WJ LAFFERTY                        |
| HBr | CO2            | T         | JCP   | 103  | 1263   | 1995 | JS MUENTER   |
| HBr | CO2            | mw        | JCP   | 103  | 3877   | 1995 | JK RICE, FJ LOVAS, GT FRASER, RD SUENRAM                                     |
| HBr | OCS            | I         | COL   | 93   | WG03   | 1993 | TA HU, SW SHARPE   |
| HBr | OCS            | mw        | JCP   | 102  | 7298   | 1995 | AR HIGHT WALKER, W CHEN, SE NOVICK, BD BEAN, MD MARSHALL                     |
| HBr | N2O            | IM        | JCP   | 93   | 183    | 1990 | YP ZENG, SW SHARPE, D REIFSCHNEIDER, C WITTIG, RA BEAUDET                    |
| HBr | N2O            | T         | CPL   | 349  | 329    | 2001 | A OKANO, H OHYAMA, T KASAI   |
| HBr | N2O            | focusing  | JCP   | 116  | 1325   | 2002 | A OKANO, H OHYAMA, T KASAI   |
| HBr | (CH2)2O        |           | JCSFT | 86   | 3975   | 1990 | AC LEGON, AL WALLWORK  |
| HBr | C6H6           | mw        | CPL   | 272  | 61     | 1997 | SA COOKE, GK CORLETT, CM EVANS, AC LEGON                                     |
| HBr | SO3            | mw        | JMSp  | 192  | 338    | 1998 | M CANAGARATNA, JA PHILLIPS, H GOODFRIEND, KR LEOPOLD                         |
| HI  | (CH3)3N        |           | JCP   | 99   | 1463   | 1993 | AC LEGON, CA REGO  |
| HI  | H2O            | mw        | CPL   | 314  | 57     | 1999 | A MCINTOSH, T WALTHER,...., AC LEGON   |
| N2  | O3             | mw        | JMSp  | 199  | 205    | 2000 | JP CONNELLY, M MEUWLY, AR AUTY, BJ HOWARD                                    |
| N2  | SO2            | mw        | JMSp  | 199  | 205    | 2000 | JP CONNELLY, M MEUWLY, AR AUTY, BJ HOWARD                                    |
| N2  | SO3            |           | JCP   | 73   | 137    | 1980 | KH BOWEN, KR LEOPOLD, KV CHANCE, W KLEMPERER                                 |
| N2  | SO3            | mw        | JMSp  |      |        | 2003 | MB CRADDOCK, CS BRAUER, KJ HIGGINS, KR LEOPOLD                               |
| N2  | HCN            |           | JCP   | 82   | 4434   | 1985 | EJ GOODWIN, AC LEGON   |
| N2  | NH3            |           | JCP   | 84   | 2472   | 1986 | GT FRASER, DD NELSON, KI PETERSON, W KLEMPERER                               |
| N2  | NH3            | mm        | MP    | 99   | 1391   | 2001 | KA WALKER, ARW McKELLAR  |
| N2  | BF3            |           | JACS  | 100  | 8074   | 1978 | KC JANDA, LS BERNSTEIN, JM STEED, SE NOVICK, W KLEMPERER                     |
| N2  | HCCH           | I         | ????  |      |        | ???? | JS MUENTER   |
| N2  | HCCH           |           | CPL   | 184  | 175    | 1991 | AC LEGON, AL WALLWORK, PW FOWLER   |
| N2  | HCCH           | I         | JMSp  | 158  | 306    | 1993 | RD BECK, AG MAKI, SH TSENG, RO WATTS   |
| N2  | DCCCH          | I         | JMSp  | 204  | 148    | 2000 | I HUNIG, L OUDEJANS, RE MILLER   |
| N2  | N2O            | M         | FDCS  | 86   | 21     | 1988 | RW RANDALL, TR DYKE, BJ HOWARD   |
| N2  | N2O            | mw        | JCP   | 110  | 4394   | 1999 | HO LEUNG {15^N2}   |
| N2  | CO2            | I         | JMSt  | 189  | 111    | 1988 | MA WALSH, TR DYKE, BJ HOWARD   |
| N2  | CO2            | mw        | JCP   | 133  | 244303 | '10  | DJ FROHMAN, ES CONTRERAS, RS FIRESTONE, SE NOVICK, W KLEMPERER               |
| N2  | C6H6           | E         | Col   |      |        | 1990 | AM SMITH, TH WEBER, E RIEDLE, HJ NEUSSER, EW SCHLAG                          |
| N2  | C6H6           |           | CPL   | 184  | 21     | 1991 | Y OHSHIMA, H KOHGUCHI, Y ENDO  |
| N2  | CH3CCH         | mI        | JCP   | 100  | 3407   | 1994 | FJ LOVAS, PW FOWLER, Z KISIEL, SH TSENG, RD BECK, DF EGGERS, TA BLAKE        |
| N2  | CH3CCH         | mI        | JMSp  | 182  | 132    | 1997 | RO WATTS   |
| N2  | In             | E         | JCP   | 102  | 9498   | 1995 | S-H TSENG, DF EGGERS, TA BLAKE, R BECK, RO WATTS, FJ LOVAS, N ZOBOV          |
| N2  | C5H5 {cpd rad} | E         | JCP   | 103  | 4447   | 1995 | LR BROCK, MA DUCAN   |
| N2  | OCS hypf & tun | mw        | JMSp  | 175  | 85     | 1996 | S SUN, ER BERNSTEIN  |
| N2  | C6H4F2         | E         | COL   | TH06 |        | 1995 | JP CONNELLY, SP DUXON, SK KENNEDY, BJ HOWARD, JS MUENTER                     |
| N2  | SiF4           | I         | JMSt  | 413  | 511    | 1997 | Q JU, CS PARMENTER, BD GILBERT   |
| N2  | N2             | T         | CPL   | 281  | 212    | 1998 | R-D URBAN, G ROUILLE, M TAKAMI   |
| N2  | N2             | T         | JCP   | 109  | 9434   | 1998 | JR STALLCOP, H PARTRIDGE   |
| N2  | N2             | T         | CPL   | 306  | 71     | 1999 | A WADA, H KANAMORI, S IWATA  |
| N2  | N2+            | I         | JCP   | 105  | 2591   | 1996 | O COURONNE, Y ELLINGER   |
| N2  | N2+            | I         | JMSp  | 185  | 425    | 1997 | T RUCHTI, T SPECK, JP CONNELLY, EJ BIESKE, H LINNARTZ, JP MAIER              |
| N2  | HN2+           | IT        | JCP   | 111  | 8400   | 1999 | T SPECK, T RUCHTI, H LINNARTZ, JP MAIER                                      |
| N2  | HI             | mw        | JCP   | 113  | 249    | 2000 | D VERDES, H LINNARTZ, JP MAIER, P BOTSCHWINA, R OSWALD, P ROSMUS, JP KNOWLES |
| N2  | C6H5OH         | T         | JCP   | 111  | 1955   | 1999 | W JABS, AL McINTOSH, RR LUCCHESI, JW BEVAN, DJ BRUGH, RD SUENRAM             |
| N2  | BrCl           | mw        | PCCP  | 4    | 441    | 2002 | DM CHAPMAN, K MULLER-DETHLEFS, JB PEEL                                       |
| N2  | OH             | I         | JCP   | 114  | 7001   | 2001 | AC LEGON, P OTTAVIANI  |
| N2  | OD             | I         | JCP   | 116  | 913    | 2002 | MD MARSHALL, BV POND, M HOPKIN, MI LESTER                                    |
| N2  | HCCCN          | I         | JMSp  | 180  | 1      | 1996 | M TSIOURIS, IB POLLACK, HO LEUNG, MD MARSHALL, MI LESTER                     |
| NO  | NO             | m         | MP    | 44   | 145    | 1981 | X YANG, RZ PEARSON, G SCOLES   |
| NO  | NO             | mw        | JMSp  | 98   | 80     | 1983 | CM WESTERN, PRR LANGRIDGE-SMITH, BJ HOWARD, SE NOVICK                        |
| NO  | NO             | I         | JCP   | 83   | 2064   | 1985 | SG KUKOLICH  |
| NO  | NO             | m         | JACS  | 104  | 4715   | 1982 | P BRECHIGNAC, SD BENEDICITIS, N HALBERSTADT, BJ WHITAKER, S AVRILLIER        |
| NO  | NO             | D         | JCP   | 85   | 2333   | 1986 | SG KUKOLICH  |
| NO  | NO             | D         | JCP   | 85   | 6235   | 1986 | MP CASASSA, JC STEPHENSON, DS KING   |
| NO  | NO             | D         | JCP   | 92   | 937    | 1990 | MP CASASSA, AM WOODWARD, JC STEPHENSON, DS KING                              |
| NO  | NO             | I         | MP    | 78   | 55     | 1993 | Y MATSUMOTO, Y OSHIMA, M TAKAMI  |
| NO  | NO             | matrix IR | JCP   | 102  | 7798   | 1995 | BJ HOWARD, ARW McKELLAR  |
| NO  | NO             | I         | MP    | 86   | 273    | 1995 | F LEGAY, N LEGAY-SOMMAIRE  |
| NO  | NO             | mw        | MP    | 89   | 1659   | 1996 | ARW McKELLAR, JKG WATSON, BJ HOWARD  |
| NO  | NO             | I         | CJP   | 75   | 181    | 1997 | SG KUKOLICH, SM SICKAFOOSE   |
| NO  | NO             | I         | JMSp  | 183  | 12     | 1997 | JKG WATSON, ARW McKELLAR   |
| NO  | NO             | mm        | JMSp  | 185  | 153    | 1997 | A DKHISSI, P SOULARD, A PERRIN, N LACOME                                     |
| NO  | NO             | T         | JCP   | 109  | 26     | 1998 | MD BROOKES, ARW McKELLAR, T AMANO  |
| NO  | NO             | T         | JCP   | 109  | 2185   | 1998 | HA DUARTE, E PROYNNOV, DR SALAHUB  |
| NO  | NO             | I         | JCP   | 109  | 4378   | 1998 | ALL EAST   |
| NO  | NO             | I         | JMSp  | 194  | 156    | 1999 | ALL EAST, ARWMCKELLAR, JKG WATSON  |
| NO  | NO             | I         | JMSp  | 194  | 229    | 1999 | A DKHISSI, N LACOME, A PERRIN  |
| NO  | NO             | Ra        | JMSp  | 194  | 278    | 1999 | ARW McKELLAR, JKG WATSON   |
| NO  | NO             |           | JMSp  | 194  | 278    | 1999 | JM FERNANDEZ, G TEJEDA, A RAMOS, BJ HOWARD, S MONTERO                        |

|    |                 |      |      |          |      |      |   |
|----|-----------------|------|------|----------|------|------|---|
| NO | NO              | PE   | JCP  | 111      | 8939 | 1999 | B URBAN, A STROBEL, VE BONDYBEY   |
| NO | NO              | T    | CP   | 263      | 61   | 2001 | JK PARK, H SUN  |
| NO | (NO)3           | I    | CPL  | 275      | 307  | 1997 | RE MILLER, L PEDERSEN   |
| NO | NO2             |      | TFS  | 65       | 1963 | 1969 | AH BRITTAIN, AP COX, RL KUCZKOWSKI  |
| NO | NO2             |      | JACS | 104      | 6927 | 1982 | SG KUKOLICH   |
| CO | CO not solved # |      | ApJ  | 234      | 503  | 1979 | JM STEED, LS BERNSTEIN, W KLEMPERER   |
| CO | CO              | I    | JMSp | 167      | 248  | 1994 | M HAVENITH, M PETRI, C LUBINA, G HILPERT  |
| CO | CO              | I    | CPL  | 287      | 365  | 1998 | MD BROOKES, ARW McKELLAR  |
| CO | CO              | mm   | CPL  | 298      | 381  | 1998 | DA ROTH, M HEPP, G WINEWISSER   |
| CO | CO              | mw   | JCP  | 111      | 5754 | 1999 | Y XU, W JAEGER  |
| CO | CO              | I    | JCP  | 111      | 7321 | 1999 | MD BROOKES, ARW McKELLAR  |
| CO | CO              | mm   | JCP  | 113      | 3034 | 2000 | DA ROTH, LA SURIN, BS DUMESH, G WINNEWISSER, I PAK  |
| CO | CO              | T    | CPL  | 314      | 326  | 1999 | M RODE, J SADLEJ, ..., A VAN DER AVOIRD   |
| CO | CO              | I,mm | JCP  | 113      | 6618 | 2000 | KA WALKER, C XIA, ARW McKELLAR  |
| CO | CO              | mm   | JMSp | 214      | 87   | 2002 | J TANG, ARW McKELLAR, LA SURIN, DN FOURZIKOV, BS DUMESH, G WINNEWISSER                    |
| CO | CO              | R    | JMSp |          |      | 2003 | LA SURIN, DN FOURZIKOV, F LEWEN, BS DUMESH, G WINNEWISSER, ARW McKELLAR                   |
| CO | CO              | mm   | JMSp | 208      | 209  | 2001 | KA WALKER, ARW McKELLAR   |
| CO | H2              | I    | COL  | TE3      |      | 1991 | C CHUAQUI, RJ LE ROY  |
| CO | H2              | I    | CPL  | 186      | 583  | 1991 | ARW McKELLAR  |
| CO | H2              | T&IR | COL  |          | RE03 | 1994 | RJ LEROY, CE CHUAQUI, ARW McKELLAR  |
| CO | H2 para         | I    | JCP  | 108      | 1811 | 1998 | ARW McKELLAR  |
| CO | H2              | T    | JCP  | 108      | 3554 | 1998 | P JANKOWSKI, K SZALEWICZ  |
| CO | H2              | mmw  | CPL  | 304      | 145  | 1999 | I PAK, LA SURIN, BS DUMESH, DA ROTH, F LEWEN, G WINNEWISSER                               |
| CO | D2 ortho        | I    | JCP  | 112      | 9282 | 2000 | ARW McKELLAR  |
| CO | D2 ortho        | mm   | JCP  | 113      | 9351 | 2000 | LA SURIN, BS DUMESH, G WINNEWISSER, I PARK  |
| CO | H2              | T    | MP   | 98       | 1995 | 2000 | R KOBAYASHI, RD AMOS, ..., CISM SIMPSON   |
| CO | H2 para         | mw   | ApJ  | 703      | 2108 | 2009 | AV POTAPOV, LA SURIN, VA PANFILOV, BS DUMESH, TF GIESEN, S SCHLEMMER, PL RASTON, W JAEGER |
| CO | N2              | I    | COL  |          | TE3  | 1991 | C CHUAQUI, RJ LE ROY  |
| CO | N2              | I    | JCP  | 104      | 2488 | 1996 | Y XU, ARW McKELLAR  |
| CO | N2              | mwmm | RSI  | 69       | 4061 | 1998 | VN MARKOV, Y XU, W JAEGER   |
| CO | N2              | mwmm | JCP  | 11110476 |      | 1999 | Y XU, W JAEGER, LA SURIN, I PAK, LA PANFILOV, G WINNEWISSER                               |
| CO | N2 para         | mw   | JCP  | 113      | 514  | 2000 | Y XU, W JAEGER  |
| CO | N2 para         | I    | JCP  | 113      | 525  | 2000 | C XIA, ARW McKELLAR, Y XU   |
| CO | N2 para/ortho   | mw   | CPL  | 315      | 201  | 1999 | Y KAWASHA, Y OHSHIMA, ..., Y ENDO   |
| CO | N2 para         | mw   | JCP  | 113      | 514  | 2000 | Y XU, W JAEGER  |
| CO | N2              | I    | JCP  | 113      | 525  | 2000 | C XIA, ARW McKELLAR, Y XU   |
| CO | N2 ortho        | mm   | JMSt | 612      | 207  | 2002 | LA SURIN, HSP MULLER, EV ALIEVA, BS DUMESH, G WINNEWISSER, I PAK                          |
| CO | SO2             |      | COL  |          | TE9  | 1991 | FJ LOVAS, RD SUENRAM  |
| CO | SO2             | I    |      |          |      | 1993 | TR DYKE, CA HWANG   |
| CO | HI              |      | JCP  | 98       | 1761 | 1993 | Z WANG, RR LUCCHESI, JW BEVAN, AP SUCKLEY, CA REGO, AC LEGON                              |
| CO | HI              | IR   | CPL  | 305      | 57   | 1999 | AL McINTOSH, Z WANG, AC LEGON   |
| CO | Cl2             | I    | COL  | 92       | WG07 | 1992 | SW BUNTE, ZS HUANG, JB MILLER, JE VERDASCO, C WITTIG, RA BEAUDET                          |
| CO | Cl2             | mw   | JPC  | 97       | 3685 | 1993 | W JAEGER, YJ XU, MCL GERRY  |
| CO | Br2             | I    | JPC  | 98       | 8310 | 1994 | Y LIN, RA BEAUDET   |
| CO | ClF             | mw   | CPL  | 242      | 404  | 1995 | K HINDS, JH HOLLOWAY, AC LEGON  |
| CO | H2              | T    | COL  | 92       | TG04 | 1992 | C CHAUQUI, T SLEE, RJ LEROY   |
| CO | CH3CCH          | mI   | JCP  | 100      | 3407 | 1994 | FJ LOVAS, PW FOWLER, Z KISIEL, SH TSENG, RD BECK, DF EGGERS, TA BLAKE RO WATTS            |
| CO | C6H6            | mw   | JCP  | 99       | 9394 | 1993 | TH BRUPBACHER, A BAUDER   |
| CO | C6H6            | T    | JCP  | 102      | 6812 | 1995 | PI NAGY, CW ULMER II, DA SMITH  |
| CO | CH3             |      | COL  | 93       | TC04 | 1993 | FJ LOVAS, RD SUENRAM, SP BELOV, MY TRETYAKOV, J ORTIGOSO                                  |
| CO | (CH)4NH         | m    | JPC  | 98       | 4551 | 1994 | RPA BETTENS, SR HUBER, A BAUDER {pyrrole}   |
| CO | (CH)5N          | m    | JCP  | 102      | 1501 | 1995 | RPA BETTENS, A BAUDER {pyridine}  |
| CO | CH3OH           | mw   | JMSp | 167      | 191  | 1994 | FJ LOVAS, SP BELOV, MY TRETYAKOV, J ONITIGOSA, RD SUENRAM                                 |
| CO | CH3OH           | I    | CJP  | 79       | 461  | 2001 | C XIA, ARW McKELLAR   |
| CO | C5H5N           | mw   | COL  | WF03     |      | 1994 | RPA BETTENS, A BAUDER   |
| CO | (CH)4O          | mw   | JCP  | 108      | 3932 | 1998 | TH BRUPBACHER, J MAKAREWICZ, A BAUDER {furan}   |
| CO | OCS             |      | MP   | 88       | 899  | 1996 | MD BROOKES, DJM CLIFT, RJ LOW, JM BROWN, BJ HOWARD  |
| CO | OCS             | I    | MP   | 98       | 1669 | 2000 | C XIA, ARW McKELLAR   |
| CO | N2O             | I    | JMSp | 184      | 156  | 1997 | H-B QIAN, BJ HOWARD   |
| CO | N2O             | mw   | JMSp | 197      | 244  | 1999 | S MWANIKI, Y XU, W JAEGER   |
| CO | SiF4            | I    | JMSt | 413      | 511  | 1997 | R-D URBAN, G ROUILLE, M TAKAMI  |
| CO | c-(CH)3NO       | mw   | JCP  | 109      | 5383 | 1998 | S McGLONE, A BAUDER {isoxazole}   |
| CO | C6H5OH          | T    | JCP  | 111      | 1955 | 1999 | DM CHAPMAN, K MULLER-DETHLEFS, JB PEEL  |
| CO | CH4             | Imm  | JCP  | 114      | 4824 | 2001 | C XIA, KA WALKER, ARW McKELLAR  |
| CO | CH4             | mw   | JCP  | 121      | 6240 | 2004 | Y LIU, W JAEGER   |
| CO | SO3             | mw   | JMSp |          |      | 2003 | MB CRADDOCK, CS BRAUER, KJ HIGGINS, KR LEOPOLD  |
| CO | SO3 Ar          | mw   | JMSp |          |      | 2003 | MB CRADDOCK, CS BRAUER, KJ HIGGINS, KR LEOPOLD  |
| CO | OD              | I    | JCP  | 119      | 118  | 2003 | IB POLLACK, M TSIOURIS, HO LEUNG, MI LESTER   |
| CO | AgF             | mw   | InC  | 41       | 1236 | 2002 | NR WALKER, MCL GERRY  |
| CO | AgCl            | mw   | InC  | 41       | 1236 | 2002 | NR WALKER, MCL GERRY  |
| CO | AgBr            | mw   | InC  | 41       | 1236 | 2002 | NR WALKER, MCL GERRY  |

|     |                     |     |       |      |       |       |  |
|-----|---------------------|-----|-------|------|-------|-------|--|
| CO  | H2S                 | mw  | JMSp  | 229  | 47    | 2005  | Y XU, P ARBOLEDA, W JAEGER   |
| CO  | HCCCN               | I   | CPL   | 204  | 145   | 1993  | X YANG, RZ PEARSON, G SCOLES   |
| CO  | HCCCN               | mw  |       |      |       | 2012  | L KANG, SE NOVICK  |
| CO  | (CH3)2S             | mw  | JMSp  |      |       | 2010  | A SATO, Y KAWASHIMA, E HIROTA  |
| Cl2 | PH3                 |     | JCP   | 98   | 3827  | 1993  | AC LEGON, HE WARNER  |
| Cl2 | CIO                 | T   | CP    | 219  | 201   | 1997  | S ALOISIO, JS FRANCISCO  |
| CIF | CIF                 | mw  | COL   | RD03 |       | 1995  | K HIGGENS, FM TAO, W KLEMPERER   |
| CIF | (CH2)2O             | mw  | CPL   | 251  | 275   | 1996  | HI BLOEMINK, CM EVANS, JH HOLLOWAY, AC LEGON {oxirane}                                   |
| CIF | (CH2)2S             | mw  | CPL   | 255  | 119   | 1996  | CM EVANS, JH HOLLOWAY, AC LEGON {thiirane}   |
| CIF | (CHCH2)2O           | mw  | CPL   | 275  | 269   | 1997  | SA COOKE, GK CORLETT, CM EVANS, JH HOLLOWAY, AC LEGON {2,5-dihydrofuran}                 |
| CIF | CO2                 | mw  | JMSt  | 406  | 15    | 1997  | SA COOKE, AC LEGON, JH HOLLOWAY  |
| CIF | N2                  | mw  | JCSFT | 92   | 2671  | 1996  | SA COOKE, G COTTI, K HINDS, JH HOLLOWAY, AC LEGON, DG LISTER                             |
| CIF | H2CO                | mw  | JCP   | 108  | 39    | 1998  | SA COOKE, GK CORLETT, CM EVANS, AC LEGON, JH HOLLOWAY                                    |
| CIF | c-(CH)4S            | mw  | CPL   | 298  | 151   | 1998  | SA COOKE, JH HOLLOWAY, AC LEGON {thiophene}  |
| CIF | c-(CH)4O            | mw  | JCSFT | 94   | 2675  | 1998  | SA COOKE, GK CORLETT, JH HOLLOWAY, AC LEGON {furan}                                      |
| LiF | NaF                 | mw  | COL   | RD06 |       | 1995  | FJ LOVAS, RD SUENRAM, Y KAWASHIMA, E HIROTA, S BIERMANN, J HOEFT, R MAWHORTER, T TORRING |
| F2  | H2S                 | mw  | CPL   | 264  | 513   | 1997  | G COTTI, CM EVANS, JH HOLLOWAY, AC LEGON   |
| F2  | (CH2)2O             |     | CPL   | 267  | 281   | 1997  | CM EVANS, JH HOLLOWAY, AC LEGON {oxirane}  |
| HCN | H2                  | I   | JCP   | 115  | 5137  | 2001  | DT MOORE, M ISHIGURO, L OUDEJANS, RE MILLER  |
| HCN | H2 He nanodrop      | I   | JCP   | 115  | 5144  | 2001  | DT MOORE, M ISHIGURO, RE MILLER  |
| HCN | H2                  | mmw | JCP   | 115  | 5155  | 2001  | M ISHIGURO, T TANAKA, K HARADA, CJ WHITHAM, K TANAKA                                     |
| HCN | NH3                 |     | JCP   | 80   | 3073  | 1984  | GT FRASER, KR LEOPOLD, DD NELSON JR, A TUNG, W KLEMPERER                                 |
| HCN | C2H2                |     | JCP   | 78   | 3521  | 1983  | PD ALDRICH, SG KUKOLICH, EJ CAMPBELL   |
| HCN | C2H2                | I   | CP    | 139  | 15    | 1989  | PA BLOCK, KW JUCKS, LG PEDERSON, RE MILLER   |
| HCN | HCCH                |     | CP    | 154  | 281   | 1991  | AI JAMAN, TC GERMANN, HS GUTOWSKI, JD AUGSPURGER, CE DYKSTRA                             |
| HCN | HCCH He nanodrpI    |     | CPL   | 346  | 129   | 2001  | K NAUTA, RE MILLER   |
| HCN | C2H4                |     | JCP   | 78   | 3552  | 1983  | SG KUKOLICH, WG READ, PD ALDRICH   |
| HCN | C2H6                |     | CPL   | 191  | 97    | 1992  | AC LEGON, AL WALLWORK, HE WARNER   |
| HCN | CO2                 |     | JCP   | 80   | 1039  | 1984  | KR LEOPOLD, GT FRASER, W KLEMPERER   |
| HCN | CO2                 | IT  | JCP   | 93   | 4560  | 1990  | DC DAYTON, LG PEDERSEN, RE MILLER  |
| HCN | CO2                 | mw  | JCP   | 90   | 4216  | 1989  | TD KLOTTS, RS RUOFF, HS GUTOWSKY   |
| HCN | (CO2)2              |     | JPC   | 94   | 7774  | 1990  | HS GUTOWSKY, J CHEN, PJ HAJDUK, RS RUOFF   |
| HCN | (CO2)3              | M   | JCP   | 92   | 862   | 1990  | HS GUTOWSKY, PJ HAJDUK, C CHUANG, RS RUOFF   |
| HCN | (CH2)3              |     | JCP   | 78   | 4832  | 1983  | SG KUKOLICH  |
| HCN | (CH2)3              |     | JACS  | 105  | 5569  | 1983  | PD ALDRICH, SG KUKOLICH, EJ CAMPBELL, WG READ  |
| HCN | (CH2)3              | I   | CPL   | 153  | 285   | 1988  | DC DAYTON, RE MILLER   |
| HCN | C6H6                |     | ????? |      |       | ????? | WA KLEMPERER, KR LEOPOLD, GT FRASER  |
| HCN | C6H6                | mwT | JCP   | 103  | 3917  | 1995  | HS GUTOWSKY, E ARUNAN, T EMILSSON, SL TSCHOPP, CE DYKSTRA                                |
| HCN | CH3OH               | mw  | COL   | TC12 |       | 1994  | FJ LOVAS, J SOBHANADRI   |
| HCN | PH3                 |     | CP    | 85   | 443   | 1984  | AC LEGON, LC WILLOUGHBY  |
| HCN | PH3                 |     | CPL   | 111  | 566   | 1984  | AC LEGON, LC WILLOUGHBY  |
| HCN | HCN                 |     | CPL   | 47   | 589   | 1977  | AC LEGON, DJ MILLEN, PJ MJOBERG  |
| HCN | HCN                 |     | JMSp  | 89   | 352   | 1981  | RD BROWN, PD GODFREY, DA WINKLER   |
| HCN | HCN                 |     | CP    | 56   | 399   | 1981  | LW BUXTON, EJ CAMPBELL   |
| HCN | HCN                 |     | CPL   | 102  | 126   | 1983  | AC LEGON, LC WILLOUGHBY, AD BUCKINGHAM   |
| HCN | HCN                 |     | CP    | 76   | 225   | 1983  | EJ CAMPBELL, SG KUKOLICH   |
| HCN | HCN                 |     | PRSL  | 399  | 377   | 1985  | K GEORGIU, AC LEGON, DJ MILLEN, PJ MJOBERG   |
| HCN | HCN                 | Ra  | JCP   | 83   | 2129  | 1985  | M MARONCELLI, GA HOPKINS, JW NIBLER, TR DYKE   |
| HCN | HCN intrstellar srh |     | ApJ   | 296  | 218   | 1985  | MS SCHENEWERK, PR JEWELL, LE SNYDER, LW BUXTON, EJ CABBELL                               |
| HCN | HCN                 | I   | JCP   | 85   | 105   | 1986  | BA WOFFORD, JW BEVAN, WB OLSON, WJ LAFFERTY  |
| HCN | HCN                 |     | CPL   | 138  | 553   | 1987  | RS RUOFF, T EMILSSON, C CHAUNG, TD KLOTS, HS GUTOWSKY                                    |
| HCN | HCN                 | I   | JCP   | 88   | 6157  | 1988  | KW JUCKS, RE MILLER  |
| HCN | HCN                 | I   | ????? |      |       | 1989  | H MEYER, ER THKERSTEL, D ZHUANG, G SCOLES  |
| HCN | HCN                 |     | CPL   | 161  | 308   | 1989  | RE BUMGARNER, GA BLAKE   |
| HCN | HCN                 | I   | COL   | RC6  |       | 1991  | ERT KERSTEL, TF MENTEL, BH PATE, G SCOLES  |
| HCN | HCN                 |     | COL   | 92   | TG05  | 1992  | PA BLOCK, RJ BEMISH, RE MILLER   |
| HCN | HCN                 |     | COL   | 92   | WG10  | 1992  | ER KERSTEL, KK LEHMANN, G SCOLES, X YANG   |
| HCN | HCN                 | I   | JMSp  | 170  | 335   | 1994  | A GRUSHOW, WA BURNS, KR LEOPOLD  |
| HCN | HCN                 | I   | COL   | TL11 |       | 1995  | A CALLEGARI, JW DOLCE, KK LEHMANN, G SCOLES  |
| HCN | HCN in He drop      | I   | JCP   | 111  | 3426  | 1999  | K NAUTA, RE MILLER   |
| HCN | BF3                 |     | JPC   | 97   | 10630 | 1993  | SW REEVE, WA BURNS, FJ LOVAS, RD SUENRAM, KR LEOPOLD                                     |
| HCN | BF3                 | I   | JCP   | 101  | 2762  | 1994  | ERTH KERSTEL, BH PATE, TF MENTEL, X YANG, G SCOLES                                       |
| HCN | BF3                 | T?  | CPL   | 248  | 179   | 1996  | E IGLESIAS, TL SORDO, JA SORDO   |
| HCN | BF3                 | T?  | CPL   | 294  | 272   | 1998  | EM CABALEIRO-LAGO, MA RIOS   |
| HCN | Hg                  |     | JCP   | 97   | 7873  | 1992  | JA SHEA, EJ CAMPBELL   |
| HCN | HCCCN               | D   | JCP   | 98   | 2727  | 1993  | X YANG, EARTH KERSTEL, G SCOLES  |
| HCN | HCCCN               | I   | JCP   | 99   | 760   | 1993  | X YANG, EARTH KERSTEL, G SCOLES  |
| HCN | (HCN)2              |     | COL   | 92   | TG05  | 1992  | PA BLOCK, RJ BEMISH, RE MILLER   |
| HCN | (HCN)2              | I   | Col   |      |       | 1987  | KW JUCKS, RE MILLER  |
| HCN | (HCN)2              | M   | JCP   | 89   | 138   | 1988  | RS RUOFF, T EMILSSON, TD KLOTS, C CHAUNG, HS GUTOWSKI                                    |
| HCN | (HCN)2              | T   | JPC   | 94   | 180   | 1990  | CE DYKSTRA   |
| HCN | (HCN)n              | T   | JCP   | 103  | 348   | 1995  | BF KING, TC FARRAR, F WEINHOLD   |
| HCN | F2                  | mw  | CPL   | 262  | 308   | 1996  | SA COOKE, G COTTI, CM EVANS, JH HOLLOWAY, AC LEGON                                       |

|        |         |     |       |     |       |      |  |                                   |
|--------|---------|-----|-------|-----|-------|------|--|-----------------------------------|
| HCN    | HCCCCH  | I   | JCP   | 105 | 10725 | 1996 | X YANG, RZ PEARSON, KK LEHMANN, G SCOLES                         |                                   |
| (HCN)2 | HF      | M   | JCP   | 90  | 4069  | 1989 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | HC1     | M   | JCP   | 90  | 4069  | 1989 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | HCF3    | M   | JCP   | 90  | 4069  | 1989 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | CO2     | M   | JCP   | 90  | 4069  | 1989 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | NH3     | M   | JCP   | 93  | 6363  | 1990 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | N2      | M   | JCP   | 93  | 6363  | 1990 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | CO      | M   | JCP   | 93  | 6363  | 1990 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | H2O     | M   | JCP   | 93  | 6363  | 1990 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | C2H4    |     | Col   |     |       | 1987 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | C3H6    |     | Col   |     |       | 1987 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | (CH2)3  |     | Col   |     |       | 1987 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| (HCN)2 | Ar      |     | JCP   | 88  | 1557  | 1988 | RS RUOFF, TI EMILSSON, TD KLOTS, C CHAUNG, HS GUTOWSKY           |                                   |
| (HCN)2 | HF CO   |     | Col   |     |       | 1987 | RS RUOFF, T EMILSSON, C CHUANG, TD KLOTS, HS GUTOWSKY            |                                   |
| HCN HF | CO      | M   | JCP   | 93  | 6971  | 1990 | T EMILSSON, TD KLOTS, RS RUOFF, HS GUTOWSKY                      |                                   |
| HCN HF | NH3     | M   | JCP   | 93  | 6971  | 1990 | T EMILSSON, TD KLOTS, RS RUOFF, HS GUTOWSKY                      |                                   |
| HCN    | (HCN)2  | I   | JCP   | 88  | 2196  | 1988 | KW JUICKS, RE MILLER   |                                   |
| HCN    | N2      | I   | JCP   | 89  | 1262  | 1988 | KW JUICKS, RE MILLER   |                                   |
| HCN    | CO      |     | CP    | 87  | 81    | 1984 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | CO      | I   | JCP   | 89  | 1262  | 1987 | KW JUICKS, RE MILLER   |                                   |
| HCN    | HCF3    |     | JCP   | 84  | 1988  | 1986 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | (CH2)2O |     | JCP   | 85  | 676   | 1986 | EJ GOODWIN, AC LEGON, DJ MILLEN                                  |                                   |
| HCN    | (CH2)2S |     | CPL   | 231 | 151   | 1994 | J COSLEOU, DG LISTER, AC LEGON {thiirane}                        |                                   |
| HCN    | (HF)2   | I   | CPL   | 156 | 578   | 1989 | DC DAYTON, RE MILLER   |                                   |
| HCN    | H2S     |     | FT2   | 80  | 1669  | 1984 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | SO2     | I   | Mar   |     |       | 1986 | JW BEVAN   |                                   |
| HCN    | SO2     |     | JCP   | 85  | 6828  | 1986 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | OCS     |     | JMSt  | 158 | 205   | 1987 | AI JAMAN, AC LEGON   |                                   |
| HCN    | OCS     | I   | JCP   | 95  | 785   | 1991 | DC DAYTON, MD MARSHALL, RE MILLER                                |                                   |
| HCN    | H2CO    |     | JCP   | 87  | 2426  | 1987 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | H2O     |     | CPL   | 98  | 369   | 1983 | AJ FILLERY-TRAVIS, AC LEGON, LC WILLOUGHBY                       |                                   |
| HCN    | H2O     |     | PRSL  | 396 | 405   | 1984 | AJ FILLERY-TRAVIS, AC LEGON, LC WILLOUGHBY                       |                                   |
| HCN    | H2O     |     | JCP   | 96  | 5808  | 1992 | HS GUTOWSKY, TC GERMANN, JD AUGSPURGER, CE DYKSTRA               |                                   |
| HCN    | (H2O)2  | T   | JPCA  | 105 | 11260 | 2001 | R RIVELINO, S CANUTO   |                                   |
| (HCN)2 | (H2O)2  | T   | JPCA  | 105 | 11260 | 2001 | R RIVELINO, S CANUTO   |                                   |
| HCN    | P(CH3)3 |     | JMSt  | 125 | 171   | 1984 | HL HIRANI, AC LEGON, DJ MILLEN, LC WILLOUGHBY                    |                                   |
| HCN    | CHF3    |     | JCP   | 84  | 1988  | 1986 | EJ GOODWIN, AC LEGON   |                                   |
| HCN    | CH3CN   |     | FT2   | 83  | 911   | 1987 | NW HOWARD, AC LEGON  |                                   |
| HCN    | CH3NC   |     | JMSt  | 270 | 449   | 1992 | AC LEGON, JC THORN   |                                   |
| HCN    | (CH3)3N | M   | JCP   | 89  | 696   | 1988 | CA REGO, RC BATTEN, AC LEGON                                     |                                   |
| HCN    | HI      | I   | JMSp  | 147 | 359   | 1991 | PA BLOCK, RE MILLER  |                                   |
| HCN    | HI      | mw  | CPL   | 226 | 501   | 1994 | PW FOWLER, AC LEGON, SA PEEBLES                                  |                                   |
| HCN    | NO2     | IM  | Col   |     |       | 1989 | DC DAYTON, RE MILLER   |                                   |
| HCN    | N2O     | M   | CPL   | 167 | 57    | 1990 | DJ PAULEY, MA ROEHRIG, SG KUKOLICH                               |                                   |
| HCN    | N2O     |     | JCP   | 93  | 3881  | 1990 | DJ PAULEY, SG KUKOLICH   |                                   |
| HCN    | N2O     |     | JPC   | 96  | 1087  | 1992 | DC DAYTON, LG PEDERSEN, RE MILLER                                |                                   |
| HCN    | CH4     | mw  | JCSCC |     | 558   | 1989 | AC LEGON, AL WALLWORK  |                                   |
| HCN    | SO3     | mw  | JPCA  | 103 | 7445  | 1999 | WA BURNS, JA PHILLIPS, M CANAGARATNA, H GOODFRIEND, KR LEOPOLD   |                                   |
| HCN    | SO3 CO  | mw  | MP    |     |       | 2006 | CS BRAUER, MB CRADDOCK, KJ HIGGINS, KR LEOPOLD                   |                                   |
| (HCN)2 | SO3     | mw  | JPCA  | 104 | 8323  | 2000 | DL FIACCO, SW HUNT, KR LEOPOLD                                   |                                   |
| H2O    | H2O     |     | JCP   | 60  | 2929  | 1974 | TR DYKE, JS MUENTER  |                                   |
| H2O    | H2O     |     | JCP   | 66  | 492   | 1977 | TR DYKE  |                                   |
| H2O    | H2O     |     | JCP   | 66  | 498   | 1977 | TR DYKE, KM MACK, JS MUENTER                                     |                                   |
| H2O    | H2O     |     | JCP   | 72  | 5062  | 1980 | JA ODUTOLA, TR DYKE  |                                   |
| H2O    | H2O     |     | JCP   | 87  | 6290  | 1987 | LH COUDERT, FJ LOVAS, RD SUENRAM, JT HOUGEN                      |                                   |
| H2O    | D2O     |     | Col   |     |       | 1987 | S JANS-BURLI, A BAUDER   |                                   |
| H2O    | H2O     |     | JCP   | 88  | 5352  | 1988 | JA ODUTOLA, TA HU, D PRINSLOW, SE O'DELL, TR DYKE                |                                   |
| H2O    | H2O     | I   | JCP   | 88  | 8008  | 1988 | ZS HUANG, RE MILLER  |                                   |
| H2O    | H2O     |     | JCP   | 90  | 6077  | 1989 | GT FRASER, RD SUENRAM, LH COUDERT                                |                                   |
| H2O    | H2O     | I   | JCP   | 90  | 3937  | 1989 | KL BUSAROW, RC COHEN, GA BLAKE, KB LAUGHLIN, YT LEE, RJ SAYKALLY |                                   |
| H2O    | H2O     | T?  | JCP   | 91  | 6613  | 1989 | ZS HUANG, RE MILLER  |                                   |
| H2O    | H2O     |     | JCP   | 91  | 7348  | 1989 | TA HU, TR DYKE   |                                   |
| D2O    | D2O     |     | JMSp  | 138 | 440   | 1989 | RD SUENRAM, GT FRASER, FJ LOVAS                                  |                                   |
| D2O    | D2O     | far | I     | COL | TL07  | 1995 | JD CRUZAN, JG LOESER, ER BITTEN, LB BRALY, RJ SAYKALLY           |                                   |
| H2O    | H2O     |     | M     | CPL | 166   | 580  | 1990   | E ZWART, JJ TER MEULEN, WL MEERTS |
| H2O    | H2O     |     |       | Col |       | 1990 | E ZWART, JJ TER EULEN, WL MEERTS                                 |                                   |
| H2O    | H2O     | Rev | IRPC  | 10  | 123   | 1991 | GT FRASER  |                                   |
| H2O    | H2O     | I   | CPL   | 217 | 436   | 1994 | ON VENTURA, K IRVING, Z LUTAJKA                                  |                                   |
| H2O    | H2O     | T   | JCP   | 101 | 3603  | 1994 | SC ALTHORPE, DC CLEARY   |                                   |
| D2O    | D2O     |     | COL   | 92  | RB03  | 1992 | EN KARYAKIN, RD SUENRAM, GT FRASER                               |                                   |
| D2O    | D2O     | I   | JCP   | 98  | 6600  | 1993 | N PUGLIANO, JD CRUZAN, JG LOESER, RJ SAYKALLY                    |                                   |
| HOD    | D2O     |     | COL   | 92  | RB03  | 1992 | EN KARYAKIN, RD SUENRAM, GT FRASER                               |                                   |
| D2O    | D2O     |     | JCP   | 96  | 1832  | 1992 | N PUGLIANO, RJ SAYKALLY  |                                   |
| H2O    | H2O     | T   | JCP   | 100 | 2865  | 1994 | KA FRANKEN, CE DYKSTRA   |                                   |

|     |                  |      |      |     |           |      |   |
|-----|------------------|------|------|-----|-----------|------|---|
| H2O | H2O tunneling    | T    | JCP  | 102 | 7817      | 1995 | JK GREGORY, DC CLARY  |
| H2O | H2O              | T    | JCP  | 103 | 8043      | 1995 | J LANGLET, J CAILLET, M CAFFAREL  |
| HOD | HOD two isotop   | mw   | JCP  | 102 | 1114      | 1995 | EN KARYAKIN, GT FRASER, FJ LOVAS, RD SUENRAM, M FUJITAKE  |
| H2O | H2O D isotopom   | mw   | JMSp | 181 | 229       | 1997 | GT FRASER, FJ LOVAS, RD SUENRAM, EN KARYAKIN, A GRUSHOW, WA BURNS, KR LEOPOLD                       |
| H2O | H2O              | T    | MP   | 92  | 667       | 1997 | DKW MOK, NC HANDY, RD AMOS  |
| H2O | H2O              | T    | JCP  | 106 | 8527      | 1997 | C LEFORESTIER, LB BRALY, K LIU, MJ ELROD, RJ SAYKALLY   |
| H2O | H2O dipole       | T(?) | CPL  | 282 | 147       | 1998 | JK GREGORY  |
| H2O | H2O              | T    | JMSp | 422 | 143       | 1998 | E KAPUY, C KOZMUTZA   |
| H2O | H2O              | T    | JCP  | 108 | 7967      | 1998 | Y BOUTEILLER, C DESFRANCOIS, JP SCHERMANN, Z LATAJKA, B SILVI                                       |
| H2O | H2O              | T    | CP   | 232 | 275       | 1998 | A FAMULARI, M RAIMUNDI, ..., E GIANINETTI   |
| H2O | H2O              | T    | CP   | 232 | 289       | 1998 | A FAMULARI, M RAIMUNDI, ..., E GIANINETTI   |
| D2O | D2O              | I    | JPCA | 102 | 3279      | 1998 | JB PAUL, RA PROVENCAL, RJ SAYKALLY  |
| H2O | H2O              | T    | JCP  | 110 | 168       | 1999 | H CHEN, S LIU, JC LIGHT   |
| H2O | H2O              | T    | JCP  | 110 | 6306      | 1999 | RS FELLERS, LB BRALY, RJ SAYKALLY, C LEFORESTIER  |
| D2O | D2O              | THz  | JCP  | 112 | 102932000 |      | LB BRALY, JD CRUZAN, K LIU, RS FELLERS, RJ SAYKALLY   |
| H2O | H2O              | THz  | JCP  | 112 | 103142000 |      | LB BRALY, K LIU, MG BROWN, FN KEUTSCH, RS FELLERS, RJ SAYKALLY                                      |
| H2O | H2O              | T    | JCP  | 111 | 6204      | 1999 | R SPECCHIO, A FAMULARI, M SIRONI, M RAIMONDI  |
| H2O | H2O              | PE   | CPL  | 321 | 333       | 2000 | GH LEE, ST ARNOLD, ..., KH BOWEN  |
| H2O | H2O              | T    | JPCA | 105 | 1163      | 2001 | L ZHI-RU, W DI, L ZE-SHENG, H XU-RI, F-M TAO, S CHIA-CHUNG  |
| H2O | H2O              | T    | JCP  | 115 | 2926      | 2001 | C-Y PARK, Y KIM, Y KIM  |
| H2O | H2O              | T    | JCP  | 116 | 690       | 2002 | GS TSCHUMPER, ML LEININGER, BC HOFFMAN, EF VALEEV, HF SCHAEFER, M QUACK                             |
| H2O | H2O              | T    | JCP  | 116 | 1479      | 2002 | CJ BURNHAM, SS XANTHEAS   |
| H2O | H2O-             | T    | JCP  | 110 | 9032      | 1999 | H-Y CHEN, W-S SHEU  |
| H2O | H2O-             | T    | JCP  | 115 | 10678     | '01  | HY CHEN, WS SHEU  |
| H2O | (H2O)1,2         | T    | JCP  | 110 | 9104      | 1999 | GR LOW, HG KJAEGAARD {OH-stretching intensities}  |
| H2O | (H2O)1-3         | T    | JMSp | 196 | 146       | 1999 | G VAN DER REST, M MASELLA {bending vib}   |
| D2O | (D2O)2           | I    | SCI  | 257 | 1937      | 1992 | N PUGLIANO, RJ SAYKALLY   |
| D2O | (D2O)2           | I    | JCP  | 110 | 4369      | 1999 | MR VIANT, MG BROWN, JD CRUZAN, RJ SAYKALLY, M GELEIJNS, A VAN DER AVOIRD                            |
| D2O | (D2O)2           | mm   | JCP  | 114 | 3988      | 2001 | FN KEUTSCH, EN KARYAKIN, RJ SAYKALLY  |
| D2O | (D2O)2           | THz  | JCP  | 114 | 3994      | 2001 | FN KEUTSCH, MG BROWN, PB PETERSEN, RJ SAYKALLY, M GELEIJNS, A van der AVOIRD                        |
| H2O | (H2O)2 tunneling | T    | JCP  | 102 | 7817      | 1995 | JK GREGORY, DC CLARY  |
| H2O | (H2O)2           | I    | JACS | 116 | 3507      | 1994 | K LIU, JG LOESER, MJ ELROD, BC HOST, JA RZEPIELA, N PUGLIANO, RJ SAYKALLY                           |
| H2O | (H2O)2           | T    | JCP  | 103 | 1077      | 1995 | T BURGI, S GRAF, S LEUTWYLER, W KLOPPER   |
| H2O | (H2O)2           | T    | JCP  | 103 | 1085      | 1995 | W KLOPPER, M SCHUTZ, HP LUTHI, S LEUTWYLER  |
| H2O | (H2O)2           | T    | JACS | 117 | 446       | 1995 | JE FOWLER, HF SCHAEFER III  |
| H2O | (H2O)2           | T    | JCP  | 103 | 8924      | 1995 | JK GREGORY, DC CLARY  |
| H2O | (H2O)2           | T    | JCP  | 105 | 6626      | 1996 | JK GREGORY, DC CLARY  |
| H2O | (H2O)2 dynamics  | T    | JCP  | 106 | 8034      | 1996 | A VAN DER AVOIRD, EHT OLTHOF, PES WORMER  |
| H2O | (H2O)2           | I    | JCP  | 106 | 8051      | 1996 | A VAN DER AVOIRD, EHT OLTHOF, PES WORMER, K LIU, RJ SAYKALLY  |
| H2O | (H2O)2           | I    | JPCA | 101 | 9032      | 1997 | MR VIANT, JD CRUZAN, DD LUCAS, MG BROWN, K LIU, RJ SAYKALLY   |
| H2O | (H2O)2 pseudoro  | T    | JCP  | 110 | 823       | 1999 | M GELEIJNS, A VAN DER AVOIRD  |
| H2O | (H2O)2 ext fld   | T    | CPL  | 299 | 132       | 1999 | CE DYKSTRA  |
| H2O | (H2O)2           | T    | JCP  | 110 | 9435      | 1999 | IMB NIELSEN, ET SEIDL, CL JANSSEN   |
| H2O | (H2O)2           | THz  | JCP  | 111 | 7789      | 1999 | MG BROWN, MR VIANT, RP MCLAUGHLIN, CJ KEOSHIAN, E MICHAEL, JD CRUZAN, RJ SAYKALLY, A VAN DER AVOIRD |
| H2O | (H2O)2           | THz  | JCP  | 114 | 4005      | 2001 | FN KEUTSCH, RS FELLERS, MR VIANT, RJ SAYKALLY   |
| H2O | (H2O)2           | rev  | CR   | 103 | 2533      | 2003 | FN KEUTSCH, JD CRUZAN, RJ SAYKALLY  |
| H2O | (H2O)2-          | T    | JCP  | 107 | 5788      | 1997 | DMA SMITH, J SMETS, Y ELKADI, L ADAMOWICZ   |
| H2O | (H2O)2H+         | T    | JCP  | 111 | 8429      | 1999 | DJ WALES  |
| H2O | (H2O)3           | T    | JCP  | 103 | 6114      | 1995 | M SCHUTZ, W KLOPPER, H-P LUTHI, S LEUTWYLER   |
| H2O | (H2O)3           | T    | MP   | 87  | 931       | 1996 | T VAN VOORHIS, CE DYKSTRA   |
| H2O | (H2O)3           | I    | JPCA | 101 | 9022      | 1997 | JD CRUZAN, MR VIANT, RJ SAYKALLY  |
| D2O | (D2O)3           | I    | JCP  | 105 | 6634      | 1996 | JD CRUZAN, MG BROWN, K LIU, B BRALY, RJ SAYKALLY  |
| D2O | (D2O)3           | THz  | JCP  | 111 | 7801      | 1999 | MG BROWN, FN KEUTSCH, LB BRALY, RJ SAYKALLY   |
| H2O | (H2O)3           | T    | JCP  | 109 | 5393      | 1998 | S GRAF, S LEUTWYLER   |
| H2O | (H2O)3           | T    | JCP  | 109 | 5404      | 1998 | D SABO, Z BACIC, S GRAF, S LEUTWYLER  |
| H2O | (H2O)4           | T    | JCP  | 105 | 6626      | 1996 | JK GREGORY, DC CLARY  |
| H2O | (H2O)4           | T    | JCP  | 105 | 6957      | 1996 | DJ WALES, TR WALSH  |
| H2O | (H2O)4           | I    | JPCA | 101 | 9011      | 1997 | K LIU, MG BROWN, JD CRUZAN, RJ SAYKALLY   |
| H2O | (H2O)4           | I    | JCP  | 109 | 9645      | 1998 | MG BROWN, FN KEUTSCH, RJ SAYKALLY   |
| H2O | (H2O)4           | T    | JCP  | 110 | 7893      | 1999 | S GRAF, W MOHR, S LEUTWYLER   |
| D2O | (D2O)4           | I    | CPL  | 292 | 667       | 1998 | JD CRUZAN, MR VIANT, MG BROWN, DD LUCAS, K LIU, RJ SAYKALLY   |
| H2O | (H2O)4-          | T    | JCP  | 110 | 3804      | 1999 | DMA SMITH, J SMETS, L ADAMOWICZ   |
| H2O | (H2O)5           | I    | JPCA | 101 | 8995      | 1997 | K LIU, MG BROWN, RJ SAYKALLY  |
| H2O | (H2O)5           | T    | CPL  | 314 | 353       | 1999 | ES KRYACHKO   |
| H2O | (H2O)5           | I    | JCP  | 115 | 6807      | 2002 | ME FAJARDO, S TAM   |
| H2O | (H2O)1-7         | ICRD | JCP  | 109 | 10201     | '98  | JB PAUL, RA PROVENCAL, C CHAPO, A PETERSON, RJ SAYKALLY   |
| H2O | (H2O)5,7         | T    | JCP  | 110 | 9039      | 1999 | J RODRIGUEZ, D LARIA, EJ MARCECA, DA ESTRIN   |
| H2O | (H2O)6           | T    | JCP  | 110 | 9128      | 1999 | J KIM, D MAJUMDAR, HM LEE, KS KIM   |
| H2O | (H2O)6-          | PE   | JCP  | 116 | 1201      | 2002 | JA KELLY, GH WEDDLE, WH ROBERTSON, MA JOHNSON   |

|        |               |    |      |      |       |      |   |
|--------|---------------|----|------|------|-------|------|---|
| H2O    | (H2O)7-9      | T  | JCP  | 110  | 1526  | 1999 | LX DANG   |
| H2O    | (H2O)1-9      | T  | JCP  | 112  | 9759  | 2000 | HM LEE, SB SUH, JY LEE, P TARAKESHWAR, KS KIM   |
| H2O    | (H2O)9-99     | I  | JPCA | 103  | 8620  | 1999 | LM GOSS, SW SHARPE, TA BLAKE, V VAIDA, JW BRAULT  |
| H2O    | (H2O)7-19     | T  | JCPA | 105  | 10520 | '01  | S MAHESHWARY, N PATEL, N SATHYAMURTHY, AD KULKARNI, SR GADRE                                    |
| H2O    | H2O H+        | T  | JCP  | 110  | 10403 | '99  | DJ WALES  |
| H2O n  | H2O+          | I  | COL  | 93   | WG13  | 1993 | CP COLLIER, RS FELLERS, ER KEIM, JA RZEPIELA, JC OWRUTSKY, ML POLKA, JV COE                     |
| H2O    | (H2O)n        | I  | JCP  | 104  | 17    | 1996 | F HUISKEN, M KALOUDIS, A KULCKE   |
| H2O    | HO2           | T  | MP   | 100  | 247   | 2002 | SD BELAIR, S KAIS, JS FRANCISCO   |
| H2O    | HO2           | mw | SCI  | 311  | 1278  | 2006 | K SUMA, Y SUMIYOSHI, Y ENDO   |
| (H2O)2 | H2            | T  | JPC  | 100  | 10875 | 1996 | J SADLEJ, SM CYBULSKI, MM SZCZESNIAK  |
| (H2O)2 | HCl           | mw | JCP  | 112  | 5767  | 2000 | Z KISIEL, E BIALKOWSKA-JAWORSKA, L PSZCZOLKOWSKI, A MILET, C STRUNIEWICZ, R MOSZYNSKI, J SADLEJ |
| (H2O)4 | substbenzene  | T  | JCP  | 114  | 4016  | 2001 | P TARAKESHWAR, KS KIM, ... B BRUTSCHY {fluorobenzene, benzene, toluene}                         |
| (H2O)2 | HCl dipole    | mw | CPL  | 325  | 523   | 2000 | Z KISIEL, J KOSARZEWSKI, BA PIETREWICZ, L PSZCZOLKOWSKI   |
| (H2O)2 | HBr dipole    | mw | CPL  | 325  | 523   | 2000 | Z KISIEL, J KOSARZEWSKI, BA PIETREWICZ, L PSZCZOLKOWSKI   |
| (H2O)2 | HBr           | mw | JCP  | 119  | 5907  | 2003 | Z KISIEL, BA PIETREWICZ, O DESYATNYK, L PSZCZOLKOWSKI   |
| H2O    | CO            | M  | JCP  | 92   | 7095  | 1990 | D YARON, KI PETERSON, D ZOLANDZ, W KLEMPERER, FJ LOVAS, RD SUENRAM                              |
| H2O    | CO            | I  | CPL  | 176  | 123   | 1991 | RE BUMGARNER, S SUZUKI, PA STOCKMAN, PG GREEN, GA BLAKE   |
| H2O    | CO            | T  | JCP  | 100  | 4272  | 1994 | J SADLEJ, V BUCH  |
| H2O    | CO            | I  | COL  | TL12 |       | 1995 | PA STOCKMAN, S SUZUKI, GA BLAKE   |
| H2O    | CO            | I  | JCP  | 109  | 5823  | 1998 | MD BROOKES, ARW McKELLAR  |
| H2O    | CO            | I  | CPL  | 306  | 214   | 1999 | L OUDEJANS, RE MILLER   |
| H2O    | (CO)2         | mw | JCP  | 102  | 7807  | 1995 | KI PETERSON, RD SUENRAM, FJ LOVAS   |
| H2O    | CO2           |    | JCP  | 80   | 2439  | 1984 | KI PETERSON, W KLEMPERER  |
| H2O    | CO2           |    | Col  |      |       | 1989 | D YARON, W KLEMPERER, KI PETERSON   |
| H2O    | CO2           | T  | JPC  | 93   | 7640  | 1989 | JR DAMEWOOD JR, RA KUMPF, WCF MUHLBAUER   |
| H2O    | CO2           | I  | JCP  | 96   | 7321  | 1992 | PA BLOCK, MD MARSHALL, LG PEDERSON, RE MILLER   |
| H2O    | CO2           | m  |      |      |       | 1994 | G COLUMBERG, J MAKAREWICZ, A BAUDER   |
| H2O    | CO2           | mw | MP   | 93   | 215   | 1998 | G COLUMBERG, A BAUDER, N HEINKING, W STAHL  |
| H2O    | CO2           | T  | JCP  | 109  | 3919  | 1998 | J SADLEJ, J MAKAREWICZ, G CHALASINSKI   |
| (H2O)2 | CO2           |    | JCP  | 94   | 106   | 1991 | KI PETERSON, RD SUENRAM, FJ LOVAS   |
| H2O    | (CO2)2        |    | JCP  | 90   | 5964  | 1989 | KI PETERSON, RD SUENRAM, FJ LOVAS   |
| H2O    | (CO2)2        |    | JCP  | 93   | 894   | 1990 | HS GUTOWSKY, C CHUANG   |
| H2O    | HOCO          | T  | JPCA | 104  | 404   | 2000 | S ALOISIO, JS FANCISCO  |
| H2O    | OCS           | T  | CPL  | 348  | 126   | 2001 | MJ WOJCIK, M BOCZAR, TA FORD  |
| H2O    | OCS           | mw | JCP  |      |       | 2004 | Y TATAMITANI, T OGATA   |
| H2O    | CS2           | mw | JMSp | 162  | 505   | 1993 | T OGATA, FJ LOVAS   |
| H2O    | CH2F2         | mw | JACS | 121  | 10098 | '99  | W CAMINATI, S MELANDRI, I ROSSI, PG FAVERO  |
| H2O    | C2H2          |    | JCP  | 81   | 3842  | 1984 | KI PETERSON, W KLEMPERER  |
| H2O    | C2H2          | I  | JCP  | 96   | 7321  | 1992 | PA BLOCK, MD MARSHALL, LG PEDERSON, RE MILLER   |
| H2O    | C2H4          |    | JCP  | 85   | 725   | 1986 | KI PETERSON, W KLEMPERER  |
| H2O    | C2H4          |    | JCP  | 98   | 791   | 1993 | AM ANDREWS, RL KUCZKOWSKI   |
| H2O    | C2H4          | T  | JCP  | 111  | 5838  | 1999 | P TARAKESHWAR, HS CHOI, SJ LEE, JY LEE, KS KIM, T-K HA, JH JANG, JG&H LEE                       |
| H2O    | C3H6          |    | JACS | 114  | 6765  | 1992 | AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI   |
| H2O    | C3H8          | m  | JCP  | 99   | 7424  | 1993 | DW STEYERT, MJ ELROD, RJ SAYKALLY, FJ LOVAS, RD SUENRAM   |
| H2O    | C3H8          | I  | JCP  | 99   | 7431  | 1993 | DW STEYERT, MJ ELROD, RJ SAYKALLY   |
| H2O    | N2O           | mw | JCP  | 97   | 2861  | 1992 | D ZOLANDANDZ, D YARRON, KI PETERSON, W KLEMPERER  |
| H2O    | N2O           | I  | JMSp | 216  | 315   | 2002 | G GIMMLER, M HAVENITH   |
| H2O    | NH3           |    | JCP  | 83   | 3768  | 1985 | P HERBINE, TR DYKE  |
| H2O    | NH3           | T  | JPC  | 94   | 217   | 1990 | Z LATAJKA, S SCHEINER   |
| H2O    | NH3           | I& | JCP  | 96   | 2496  | 1992 | PA STOCKMAN, RE BUMGARNER, S SUZUKI, PG GREEN, GA BLAKE   |
| H2O    | NH3           |    | JCP  | 93   | 5485  | 1990 | P HERBINE, TA HU, G JOHNSON, TR DYKE  |
| H2O    | NH3 umbr      | I  | JCP  | 96   | 7287  | 1992 | GT FRASER, RD SUENRAM   |
| H2O    | NH3           | T  | JPCA | 103  | 8528  | 1999 | J SADLEJ, R MOSZYNSKI, JC DOBROWOLSKI, AP MAZUREK   |
| H2O    | NH3 (H2O)H+   | T  | JCP  | 105  | 6844  | 1996 | H-P CHENG   |
| H2O    | NH2CHO        |    | JCP  | 88   | 722   | 1988 | FJ LOVAS, RD SUENRAM, GT FRASER, CW GILLIES, J ZOZOM  |
| H2O    | NH2CHO matrix | I  | JCP  | 99   | 4894  | 1993 | A ENGDAHL, B NELANDER, PO ASTRAND   |
| H2O    | H2CO          | mw | JMSp | 179  | 320   | 1996 | FJ LOVAS, CL LUGEZ  |
| H2O    | H2CO          | T  | JPC  | 97   | 11415 | '93  | TK HA, J MAKAREWICZ, A BAUDER   |
| H2O    | H2CO          | T  | JCP  | 100  | 4374  | 1994 | TA RAMELOT, CH HU, JE FOWLER, BJ DELEEUEW, HF SCHAEFER III                                      |
| H2O    | H2CO          | m  |      |      |       | 1994 | F BETTENS, J MAKARAEWICZ, A BAUDER  |
| H2O    | H2S           |    | Col  |      |       | 1988 | FJ LOVAS, RD SUENRAM, LH COUDERT  |
| H2O    | H2S           | T  | CPL  | 230  | 480   | 1994 | YB WANG, FM TAO, YK PAN   |
| H2O    | O3            |    | JMSp | 146  | 493   | 1991 | JZ GILLIES, CW GILLIES, RD SUENRAM, FJ LOVAS, T SCHMIDT, D CREMER                               |
| H2O    | O3 dynamics   |    | JCP  | 100  | 4200  | 1994 | DS KING, DG SAUDER, MP CASASSA  |
| H2O    | OH            | mw | CPL  | 401  | 420   | 2005 | CS BRAUER, G SEDO, EM GRUMSTRUP, KR LEOPOLD, MD MARSHALL, HO LEUNG                              |
| (H2O)2 | OH-           | T  | JMSp | 577  | 239   | 2002 | N TURKI, A MILET, O ORAMERALI, R MOSZYNSKI, E KOCHANSKI   |
| H2O    | N2            | M  | JCP  | 90   | 700   | 1989 | HO LEUNG, MD MARSHALL, RD SUENRAM, FJ LOVAS   |
| H2O    | N2            | I  | Col  |      |       | 1990 | RE BUMGARNER, J BOWEN, PG GREEN, GA BLAKE   |
| H2O    | N2            | I  | JPCA | 102  | 7294  | 1998 | IM SVISHCHEV, RJ BOYD   |
| H2O    | O2            | I  | JPCA | 102  | 7294  | 1998 | IM SVISHCHEV, RJ BOYD   |
| H2O    | F2            | mw | ACI  | 36   | 129   | 1997 | SA COOKE, G COTTI, JH HOLLOWAY, AC LEGON  |
| H2O    | F2            | mw | CEJ  | 7    | 2295  | 2001 | SA COOKE, G COTTI, CM EVANS, JH HOLLOWAY, Z KISIEL, AC LEGON, JMA THUMWOOD                      |

|          |              |      |      |      |       |      |  |
|----------|--------------|------|------|------|-------|------|--|
| H2O      | SO2          |      | JCP  | 91   | 5887  | 1989 | K MATSUMURA, FJ LOVAS, RD SUENRAM  |
| H2O      | SO3          | mw   | JPC  | 99   | 501   | 1995 | JA PHILLIPS, M CANAGARATNA, H GOODFRIEND, KR LEOPOLD   |
| H2O      | SO3 NH3      | T    | JPCA | 105  | 4344  | 2001 | LJ LARSON, F-M TAO   |
| H2O      | SO3 NH3      | mw   | CP   |      |       | 2004 | SW HUNT, CS BRAUER, MB CRADDOCK, KJ HIGGINS, AM NIENOW, KR LEOPOLD                           |
| H2O      | H2SO4        | mw   | JACS | 124  | 4504  | 2002 | DL FIACCO, SW HUNT, KR LEOPOLD   |
| H2O      | N2O          | M    | CoI  |      |       | 1989 | D YARON, W KLEMPERER, KI PETERSON  |
| H2O      | NO2          | T    | CPL  | 312  | 306   | 1999 | DW BALL  |
| H2O      | PF3          | M    | JPC  | 95   | 3523  | 1991 | MS LABARGE, AM ANDREWS, A TALEBBENDIAB, KW HILLIG II, RL KUCZKOWSKI, RK BOHN                 |
| H2O      | CH4          | I    | JCP  | 100  | 863   | 1994 | L DORE, RC COHEN, CA SCHMUTTENMAER, KL BUSAROW, MJ ELROD, JG LOESER, RJ SAYKALLY             |
| H2O      | CH4          | mw   | JCP  | 101  | 7230  | 1994 | RD SUENRAM, GT FRASER, FJ LOVAS, Y KAWASHIMA   |
| H2O      | HCCCCH       |      | JMSp | 144  | 123   | 1990 | K MATSUMURA, FJ LOVAS, RD SUENRAM  |
| H2O      | NCCN         |      | JCP  | 96   | 5577  | 1992 | S LEE, II SUNI, W KLEMPERER  |
| H2O      | CH3OH        | tunn | JMSp | 159  | 363   | 1993 | JT HOUGEN, N OHASHI  |
| H2O      | CH3OH        | mw   | JCP  | 107  | 3782  | 1997 | PA STOCKMAN, GA BLAKE, FJ LOVAS, RD SUENRAM  |
| H2O      | CH3OH        | T    | JCP  | 109  | 139   | 1998 | L GONZALEZ, O MO, M YANEZ  |
| (H2O)2   | CH3OH        | T    | JCP  | 109  | 139   | 1998 | L GONZALEZ, O MO, M YANEZ  |
| H2O      | CH3F         | T    | JPCA | 105  | 9004  | 2001 | JE MONAT, RR TOCZYLOWSKI, SMCYBULSKI   |
| H2O      | C6H6         |      | SCI  | 257  | 942   | 1992 | S SUZUKI, PG GREEN, RE BUMGARNER, S DASGUPTA, WA GODDARD III, GA BLAKE                       |
| H2O      | C6H6         | mw   | JCP  | 99   | 4883  | 1993 | HS GUTOWSKY, T EMILSSON, E ARUNAN  |
| H2O      | C6H6         |      | COL  | 93   | TC10  | 1993 | S SUZUKI, PG GREEN, RE BUMGARNER, RD SUENRAM, FJ LOVAS, S DASGUPTA, WA GODDARD III, GA BLAKE |
| H2O      | C6H6         | I    | JCP  | 103  | 531   | 1995 | RN PRIBBLE, AW GARRETT, K HABER, TS ZWIER  |
| H2O      | C6H6         | T    | COL  | FC12 |       | 1995 | S SUZUKI, GA BLAKE   |
| H2O      | C6H6         | T    | JCP  | 110  | 8461  | 1999 | W KIM, D NEUHAUSER, MR WALL, PM FELKER   |
| H2O      | C6H6         | T    | JCP  | 111  | 5838  | 1999 | P TARAKESHWAR, HS CHOI, SJ LEE, JY LEE, KS KIM, T-K HA, JH JANG, JG&H LEE                    |
| H2O      | C6H6         | mw   | JCP  | 112  | 1204  | 2000 | T MILSSON, HS GUTOWSKY, G de OLIVEIRA, CE DYKSTRA  |
| H2O+     | C6H6         | I    | CPL  | 349  | 431   | 2001 | M MIYAZAKI, A FUJII, T EBATA, N MIKAMI   |
| (H2O)2   | C6H6         | T    | JCP  | 106  | 849   | 1997 | JM SORENSON, JK GREGORY, DC CLARY  |
| (H2O)2   | C2H4         | T    | JCP  | 111  | 5838  | 1999 | P TARAKESHWAR, HS CHOI, SJ LEE, JY LEE, KS KIM, T-K HA, JH JANG, JG&H LEE                    |
| H2O      | C6H5OH       | mw   | JCP  | 104  | 967   | 1996 | M GERHARDS, M SCHMITT, K KLEINERMANN, W STAHL  |
| H2O      | C6H5OH       | E    | JCP  | 104  | 972   | 1996 | G BERDEN, WL MEERTS, M SCHMITT, K KLEINERMANN  |
| H2O      | C6H5OH       | T    | JCP  | 105  | 420   | 1996 | H WATANABE, S IWATA  |
| H2O      | C6H5OH       | RTPI | JCP  | 108  | 4496  | 1998 | RM HELM, H-P VOGEL, HJ NEUSSER   |
| H2O      | C6H5OH       | T    | CPL  | 350  | 565   | 2001 | HH TSUI, T VANMOURIK   |
| (H2O)7,8 | C6H5OH       | E    | JCP  | 110  | 9898  | 1999 | C JANZEN, D SPANGENBERG, W ROTH, K KLEINERMANN   |
| H2O      | C6H4(OH)2    | RTPI | JCP  | 104  | 9362  | 1996 | M GERHARDS, W PERL, S SCHUMM, U HENRICH, C JACOBY, K KLEINERMANN                             |
| H2O      | C6H5F        | T    | JCP  | 110  | 8501  | 1999 | P TARAKESHWAR, KS KIM, B BRUTSCHY  |
| H2O      | C6H4F2       | T    | JCP  | 110  | 8501  | 1999 | P TARAKESHWAR, KS KIM, B BRUTSCHY {p-difluorobenzene}  |
| H2O      | C6H5NH2      | mw   | JMSp | 190  | 278   | 1998 | U SPOEREL, W STAHL {aniline}   |
| H2O      | C6H5CH2OH    | IE   | JCP  | 111  | 8438  | 1999 | N GUCHHAIT, T EBATA, N MIKAMI {benzyl alcohol}   |
| H2O      | c-C4H8ONH    | mw   | JMSp | 190  | 372   | 1998 | O INDRIS, W STAHL, U KRETSCHMER {morpholine}   |
| H2O      | (CH)4NH      | mw   | JPC  | 97   | 7451  | 1993 | MJ TUBERGEN, AM ANDREWS, RL KUCZKOWSKI {pyrrole}   |
| H2O      | (CH3)3N      | mw   | JACS | 115  | 9263  | 1993 | MJ TUBERGEN, RL KUCZKOWSKI   |
| H2O      | (CH3)2NH     | mw   | JMSt | 352  | 335   | 1995 | MJ TUBERGEN, RL KUCZKOWSKI   |
| H2O      | HCOOH        | m    |      |      |       | 1994 | R SPYCHER, A BAUDER  |
| H2O      | HCOOH        | mw   | JCP  | 113  | 169   | 2000 | D PRIEM, T-K HA, A BAUDER  |
| (H2O)2   | HCOOH        | mw   | JCP  | 113  | 169   | 2000 | D PRIEM, T-K HA, A BAUDER  |
| H2O      | CH3COOH      | mw   | PCCP | 11   | 366   | 2009 | B OUYANG, BJ HOWARD {acetic acid}  |
| (H2O)2   | CH3COOH      | mw   | PCCP | 11   | 366   | 2009 | B OUYANG, BJ HOWARD {acetic acid}  |
| H2O      | (HCOOH)2     | mw   | JCP  | 113  | 169   | 2000 | D PRIEM, T-K HA, A BAUDER  |
| H2O      | (CH2)4O      | mw   | COL  | TC05 |       | 1994 | FL BETTENS, RPA BETTENS, A BAUDER  |
| H2O      | (CH)4O ?     | m    |      |      |       | 1994 | F BETTENS, RPA BETTENS, A BAUDER   |
| H2O      | CH3CN        | mw   | COL  | TC12 |       | 1994 | FJ LOVAS, J SOBHANADRI   |
| H2O      | CH3NO2       | mw   | JMSp | 171  | 189   | 1995 | FJ LOVAS, N ZOBOV, GT FRASER, RD SUENRAM   |
| H2O      | N(CH2CH2)3CH | mw   | JMSp | 174  | 520   | 1995 | D CONSALVO, W STAHL {1-azabicyclo[2.2.2]octane}  |
| H2O      | HNO3         | mw   | COL  | RD04 |       | 1995 | FM TAO, K HIGGINS, W KLEMPERER, DD NELSON  |
| H2O      | NaCl         | mw   | COL  | RD05 |       | 1995 | A MIZOGUCHI, Y OHSHIMA, Y ENDO   |
| H2O      | HCCCN        | mw   | JMSp | 179  | 85    | 1996 | RM OMRON, AR HIGHT WALKER, G HILPERT, GT FRASER, RD SUENRAM                                  |
| H2O      | c-C7H5OOH    | I    | JCP  | 105  | 2605  | 1996 | RK FROST, FC HAGEMEISTER, CA ARRINGTON, D SCHLEPPENBACH, KD JORDAN {tropolone}               |
| H2O      | C6H5CN       | mw   | ZNAT | 52   | 293   | 1997 | V STORM, D CONSALVO, H DREIZLER  |
| H2O      | C6H5CN       | mwUV | ZNAT | 52   | 655   | 1997 | RM HELM, H-P VOGEL, HJ NEUSSER, V STORM, D CONSALVO, H DREIZLER                              |
| H2O      | C6H5CN       | mw   | JCP  | 111  | 3874  | 1999 | S MELANDRI, D CONSALVO, W CAMINATI, PG FAVERO {benzonitrile}                                 |
| H2O      | c-(OCH2CH2)2 | mm   | JACS | 120  | 5555  | 1998 | W CAMINATI, A DELL'ERBA, S MELANDRI, PG FAVERO {1,4-dioxane}                                 |
| H2O      | c-C2H4O      | mm   | JACS | 120  | 11144 | '98  | W CAMINATI, P MORESCHINI, I ROSSI, PG FAVERO {ethylene oxide}                                |
| H2O      | c-C2H2NC2H2N | mw   | ACI  | 37   | 792   | 1998 | W CAMINATI, LB FAVERO, PG FAVERO {pyrazine}  |
| H2O      | c-C4H4NH     | mw   | JACS | 120  | 2616  | 1998 | W CAMINATI, A DELL'ERBA, G MACCAFERRI, PG FAVERO {pyrrolidine}                               |
| H2O      | c-C5H10O     | mw   | CEJ  | 4    | 1974  | 1998 | U SPOEREL, W STAHL, W CAMINATI, PG FAVERO {tetrahydropyran}                                  |
| H2O      | c-C4H4N2     | mw   | JPCA | 102  | 8097  | 1998 | W CAMINATI, P MORESCHINI, PG FAVERO {pyridazine}   |
| H2O      | c-C3H3NCHN   | mw   | JACS | 120  | 11504 | '98  | S MELANDRI, ME SANZ, W CAMINATI, PG FAVERO, Z KISIEL {pyrimidine}                            |
| H2O      | c-(CH2)4S    | mw   | JPCA | 103  | 5285  | 1999 | ME SANZ, JC LOPEZ, JL ALONSO, A MARIS, PG FAVERO, W CAMINATI {tetrahydrothiophene}           |

|          |                  |           |      |        |      |  |
|----------|------------------|-----------|------|--------|------|--|
| H2O      | H2NCH(CH3)CONH2  | JACS      | 122  | 2938   | 2000 | RJ LAVRICH, MJ TUBERGEN {alaninamide, mw}  |
| H2O      | CH2CHOHCH2CH2O   | JPCA      | 105  | 8317   | 2001 | RJ LAVRICH, CR TOROK, MJ TUBERGEN {3-hydroxytetrahydrofuran, mw}                                 |
| H2O      | c-(CH2)3NO       | mw MP     | 99   | 1353   | 2001 | S McGLONE, P MORESCHINI, T-K HA, A BAUDER {isoxazole}  |
| H2O      | ClF              | T CPL     | 268  | 321    | 1997 | AK CHANDRA, MT NGUYEN  |
| H2O      | ClF              | mw CEJ    | 7    | 2295   | 2001 | SA COOKE, G COTTI, CM EVANS, JH HOLLOWAY, Z KISIEL, AC LEGON, JMA THUMWOOD                       |
| H2O      | ICl              | mw PCCP   | 2    | 1659   | 2000 | JP DAVEY, AC LEGON, ER WACLAWIK  |
| H2O      | Cl-              | I JACS    | 120  | 12361  | '98  | P AYOTTE, GH WEDDLE, ..., MA JOHNSON   |
| H2O      | Br-              | I JACS    | 120  | 12361  | '98  | P AYOTTE, GH WEDDLE, ..., MA JOHNSON   |
| H2O      | I-               | I JACS    | 120  | 12361  | '98  | P AYOTTE, GH WEDDLE, ..., MA JOHNSON   |
| (H2O)1-6 | F-               | T JCP     | 110  | 9116   | 1999 | J BAIK, J KIM, D MAJUMDAR, KS KIM  |
| (H2O)n   | c-C6H5CN n=1-3   | IRa JCP   | 110  | 9504   | 1999 | S ISHIKAWA, T EBATA, N MIKAMI {benzonitrile}   |
| H2O      | c-(CH)3NO        | mw MP     | 99   | 1353   | 2001 | S McGLONE, P MORESCHINI, T-K HA, A BAUDER {isoxazole}  |
| H2O      | C28H18           | RCS JCP   | 113  | 11109  | '00  | T FUJIWARA, Y FUJIMURA, O KAJIMOTO {9-9'-bianthryl}  |
| H2O      | c-C6H4C2H2NH     | E dip JCP |      |        | 2005 | C KANG, TM KORTER, DW PRATT {indole}   |
| H2O      | c-(CH2)3O        | mw JCP    | 123  | 164304 | '05  | S MELANDRI, A MAIS, BM GIULIANO, W CAMINATI {cyclobutanone}                                      |
| H2O      | C5H5N            | TRa JPCA  | 105  | 9983   | 2001 | S SCHLUECKLER, RK SINGH, BP ASTHANE(?), J POPP, W KIEFER {pyridine}                              |
| (H2O)1-3 | CF2HCOOH         | mw JPCA   |      |        | 2010 | B OUYANG, BJ HOWARD {trans and gauche difluoroacetic acid}                                       |
| H2O      | AgCl             | mw ACI    | 49   | 181    | 2010 | SJ HARRIS, AC LEGON, NR WALKER, DE WHEATLY   |
| NH3      | HCN              | JCP       | 82   | 2535   | 1985 | GT FRASER, DD NELSON, A CHARO, W KLEMPERER   |
| NH3      | HCN              | T CP      | 182  | 39     | 1994 | S CHATTOPADHYAY, PLM PLUMMER   |
| NH3      | HCCH             | JCP       | 80   | 1423   | 1984 | GT FRASER, KR LEOPOLD, W KLEMPERER   |
| NH3      | HCCH             | JCP       | 82   | 2535   | 1985 | GT FRASER, DD NELSON, A CHARO, W KLEMPERER   |
| NH3      | HCCH vib coupl   | I JCP     | 105  | 6183   | 1996 | G HILPERT, GT FRASER, AS PINE  |
| NH3      | HCN vib coupl    | I JCP     | 105  | 6183   | 1996 | G HILPERT, GT FRASER, AS PINE  |
| NH3      | HCCCH vib cou    | I JCP     | 105  | 6183   | 1996 | G HILPERT, GT FRASER, AS PINE  |
| NH3      | CO2              | JCP       | 81   | 2577   | 1984 | GT FRASER, KR LEOPOLD, W KLEMPERER   |
| NH3      | CO2              | JCP       | 82   | 2535   | 1985 | GT FRASER, DD NELSON, A CHARO, W KLEMPERER   |
| NH3      | NH3              | # JCP     | 82   | 2535   | 1985 | GT FRASER, DD NELSON, A CHARO, W KLEMPERER   |
| NH3      | NH3              | JCP       | 83   | 6201   | 1985 | DD NELSON, GT FRASER, W KLEMPERER  |
| NH3      | NH3              | T JCP     | 85   | 2077   | 1986 | SY LIU, CE DYKSTRA, K KOLENBRANDER, JM LISY  |
| NH3      | NH3              | T JCP     | 87   | 139    | 1987 | DD NELSON, W KLEMPERER   |
| NH3      | NH3              | P JCP     | 85   | 6261   | 1986 | F CARNOVALE, JB PEEL, RG ROTHWELL  |
| NH3      | NH3              | JCP       | 87   | 6364   | 1987 | DD NELSON, W KLEMPERER, GT FRASER, FJ LOVAS, RD SUENRAM  |
| NH3      | NH3              | Z JCP     | 88   | 3028   | 1988 | U BUCK, H MEYER, D NELSON, GT FRASER, W KLEMPERER  |
| NH3      | NH3              | I JCP     | 94   | 4776   | 1991 | M HAVENITH, RC COHEN, KL BUSAROW, DH GWO, YT LEE, RJ SAYKALLY                                    |
| NH3      | NH3              | T JMSp    | 149  | 73     | 1991 | JT HOUGEN, LH COUDERT  |
| NH3      | NH3              | I COL     | 92   | ME14   | 1992 | M HAVENITH, H LINNARTZ, E ZWART, A KIPS, JJ TER MEULEN, WL MEERTS                                |
| NH3      | NH3              | I JCP     | 97   | 4727   | 1992 | JG LOESER, CA SCHMUTTENMAER, RC COHEN, MJ ELROD, DW STEYERT, RJ SAYKALLY, RE BUMGARNER, GA BLAKE |
| NH3      | NH3              | T JCP     | 97   | 4750   | 1992 | JWI VAN BLADEL, A VAN DER AVOIRD, RES WORMER, RJ SAYKALLY  |
| NH3      | NH3              | I JCP     | 99   | 2449   | 1993 | H LINNARTZ, A KIPS, WL MEERTS, M HAVENITH  |
| NH3      | NH3              | T COL     | 93   | RC04   | 1993 | FM TAO, W KLEMPERER  |
| NH3      | NH3              | T CPL     | 228  | 451    | 1994 | SM CYBULSKI  |
| NH3      | NH3              | T JCP     | 101  | 8430   | 1994 | EHT OLTTHOF, A VAN DER AVOIRD, PES WORMER  |
| NH3      | NH3 inversion    | T JCP     | 101  | 8843   | 1994 | EHT OLTTHOF, A VAN DER AVOIRD, PES WORMER, JG LOESER, RJ SAYKALLY                                |
| NH3      | NH3              | T JCP     | 102  | 3648   | 1995 | FF MUGUET, GW ROBINSON   |
| NH3      | NH3              | T JCP     | 102  | 3655   | 1995 | FF MUGUET, GW ROBINSON, MP BASSEZ-MUGUET   |
| NH3      | NH3              | I CP      | 193  | 327    | 1995 | H LINNARTZ, WL MEERTS, M HAVENITH  |
| NH3      | NH3 quadrupole   | mw JCP    | 102  | 8693   | 1995 | N HEINEKING, W STAHL, ETH OLTTHOF, PES WORMER, A VAN DER AVOIRD, M HAVENITH                      |
| NH3      | NH3              | mw COL    | RD01 |        | 1995 | JG LOESER, RJ SAYKALLY, N KARAYAKIN, GT FRASER, RD SUENRAM                                       |
| NH3      | NH3              | T JCP     | 103  | 8043   | 1995 | J LANGLET, J CAILLET, M CAFFAREL   |
| NH3      | NH3 Stark        | FIR JCP   | 104  | 3898   | 1996 | G COTTI, H LINNARTZ, WL MEERTS, A van der AVOIRD, HT OLTTHOF                                     |
| ND3      | ND3              | mm JCP    | 110  | 9555   | 1999 | EN KARYAKIN, GT FRASER, JG LOESER, RJ SAYKALLY   |
| NH3      | NH3              | T JCP     | 112  | 230    | 2000 | JS LEE, SY PARK  |
| NH3      | NH3              | D JCP     | 116  | 1443   | 2002 | P FARMANARA, HH RITZE, V STEVT, W RADLOFF, IV HERTEL   |
| NH3      | (NH3)2           | D JCP     | 116  | 1443   | 2002 | P FARMANARA, HH RITZE, V STEVT, W RADLOFF, IV HERTEL   |
| (NH3)2   | He_2700          | I JCP     | 107  | 7179   | 1997 | M BEHRENS, U BECK, R FROCHTENICHT, M HARTMANN, M HAVENITH  |
| NH3      | OCS              | JCP       | 82   | 2535   | 1985 | GT FRASER, DD NELSON JR, A CHARO, W KLEMPERER  |
| NH3      | N2O              | JCP       | 82   | 2535   | 1985 | GT FRASER, DD NELSON JR, A CHARO, W KLEMPERER  |
| NH3      | N2O              | JCP       | 83   | 5442   | 1985 | GT FRASER, DD NELSON JR, GJ GERFEN, W KLEMPERER  |
| NH3      | CO               | JCP       | 84   | 2472   | 1986 | GT FRASER, DD NELSON JR, KI PETERSON, W KLEMPERER  |
| NH3      | CO               | Imm MP    | 99   | 63     | 2001 | C XIA, KA WALKER, ARW McKELLAR   |
| NH3      | CF3H             | JCP       | 84   | 5983   | 1986 | GT FRASER, FJ LOVAS, RD SUENRAM, DD NELSON JR, W KLEMPERER                                       |
| NH3      | CH3OH            | M CP      | 125  | 35     | 1988 | GT FRASER, RD SUENRAM, FJ LOVAS, WJ STEVENS  |
| NH3      | H2S              | JCP       | 93   | 5485   | 1990 | P HERBINE, TA HU, G JOHNSON, TR DYKE   |
| NH3      | H2S tunn1,int    | mm JCP    | 102  | 4321   | 1995 | G HILPERT, GT FRASER, RD SUENRAM, EN KARYKIN   |
| NH3      | HCCCH            | JMSp      | 144  | 123    | 1990 | K MATSUMURA, FJ LOVAS, RD SUENRAM  |
| NH3      | HCCCH vib couplg | COL RE10  |      |        | 1994 | G HILPERT, GT FRASER, AS PINE  |
| NH3      | NCCN             | M JPC     | 95   | 2859   | 1991 | I SUNI, S LEE, W KLEMPERER   |
| NH3      | NCH              | I CP      | 156  | 523    | 1991 | GT FRASER, AS PINE, WA KREINER, RD SUENRAM   |
| NH3      | NCH vib couplg   | COL RE10  |      |        | 1994 | G HILPERT, GT FRASER, AS PINE  |
| NH3      | SiF4             | JCP       | 96   | 3441   | 1992 | RS RUOFF, TEMILSSON, AI JAMAN, TC GERMANN, HS GUTOWSKI   |

|        |                  |        |       |      |        |      |   |                                     |
|--------|------------------|--------|-------|------|--------|------|---|-------------------------------------|
| NH3    | SiF4             | T      | JCP   | 96   | 3447   | 1992 | TA KEITH, RFW BADER   |                                     |
| NH3    | C6H6             |        | NATU  | 362  | 735    | 1993 | DA RODHAM, S SUZUKI, RD SUENRAM, FJ LOVAS, S DASGUPTA, WA GODDARD III, GA BLAKE         |                                     |
| NH3    | C6H5OH           | ET     | JCP   | 102  | 9197   | 1995 | A SCHIEFKE, C DEUSEN, C JACOBY, M GERHARDS, M SCHMITT, K KLEINERMANN                    |                                     |
| NH3    | (CH2)3           | mw     | CPL   | 218  | 349    | 1994 | SE FOREST, RL KUCZKOWSKI  |                                     |
| NH3    | BF3              |        | JCSCC |      | 1      | 1995 | D FUJIANG, PW FOWLER, AC LEGON  |                                     |
| NH3    | Br2              | mw     | JCP   | 103  | 876    | 1995 | HI BLOEMINK, AC LEGON   |                                     |
| NH3    | ClF              | mw     | CPL   | 248  | 260    | 1996 | HI BLOEMINK, CM EVANS, JH HOLLOWAY, AC LEGON  |                                     |
| NH3    | SO3              | mw     | JACS  | 118  | 5290   | 1996 | M CANAGARATNA, JA PHILLIPS, H GOODFRIEND, KR LEOPOLD                                    |                                     |
| NH3    | SO3 dipole       | mw     | CPL   | 281  | 63     | 1997 | M CANAGARATNA, ME OTT, KR LEOPOLD   |                                     |
| NH3    | C6H5CHCH2        | E      | COL   | TH04 |        | 1995 | E ZINGHER, S ZILBERG, Y HAAS  |                                     |
| NH3    | trans-1-naphthol | E      | JCP   | 104  | 8332   | 1996 | SJ HUMPHREY, DW PRATT   |                                     |
| NH3    | CH3CCH           | mw     | JMSP  | 179  | 85     | 1996 | RM OMRON, AR HIGHT WALKER, G HILPERT, GT FRASER, RD SUENRAM                             |                                     |
| NH3    | CHCCN            | mw     | JMSP  | 179  | 85     | 1996 | RM OMRON, AR HIGHT WALKER, G HILPERT, GT FRASER, RD SUENRAM                             |                                     |
| NH3    | t-hydroquinone   | E      | JCP   | 106  | 908    | 1997 | SJ HUMPHREY, DW PRATT   |                                     |
| NH3    | HCCCH3           | T      | MP    | 89   | 1553   | 1996 | B SCHULZ, P BOTSCHWINA  |                                     |
| NH3    | C6H5NH2          | E      | JCP   | 106  | 3029   | 1997 | JA FERNANDEZ, ER BERNSTEIN  |                                     |
| NH3    | HNO3             | mw     | JPCA  | 103  | 1322   | 1999 | ME OTT, KR LEOPOLD  |                                     |
| NH3    | (CH3)3Al         | mwT    | JACS  | 121  | 4674   | 1999 | J MULLER, U RUSCHEWITZ, ..., W STAHL  |                                     |
| NH3    | C4H5N            | mw     | JMSP  |      |        | 2008 | C RENSING, H MADER, F TEMPS {pyrrole}   |                                     |
| NCCN   | NCCN             | M      | JPC   | 95   | 2859   | 1991 | I SUNI, S LEE, W KLEMPERER  |                                     |
| BF3    | Ar               |        | JACS  | 100  | 8074   | 1978 | KC JANDA, LS BERNSTEIN, JM STEED, SE NOVICK, W KLEMPERER                                |                                     |
| BF3    | CO               |        | JACS  | 100  | 8074   | 1978 | KC JANDA, LS BERNSTEIN, JM STEED, SE NOVICK, W KLEMPERER                                |                                     |
| BF3    | CO               | I      | JCP   | 98   | 3612   | 1993 | GH LEE, M TAKAMI  |                                     |
| BF3    | CO2              | #      | JACS  | 106  | 897    | 1983 | KR LEOPOLD, GT FRASER, W KLEMPERER  |                                     |
| BF3    | CO2              | mw     | COL   | TB05 |        | 1995 | A GRUSHOW, H GOODFRIEND, M CANAGARATNA, KR LEOPOLD, GT FRASER, W KLEMPERER              |                                     |
| BF3    | CO2              | I      | JMSt  | 436  | 69     | 1998 | LM NXUMALO, TA FORD {issue 436-437 of JMSt}   |                                     |
| BF3    | N2O              |        | JACS  | 106  | 897    | 1983 | KR LEOPOLD, GT FRASER, W KLEMPERER  |                                     |
| BF3    | NCCN             |        | JACS  | 106  | 897    | 1983 | KR LEOPOLD, GT FRASER, W KLEMPERER  |                                     |
| BF3    | CH3CN            | mw     | JACS  | 114  | 108    | 1992 | MA DVORAK, RS FORD, RD SUENRAM, FJ LOVAS, KR LEOPOLD                                    |                                     |
| BF3    | SO2              | mw     | JMSt  | 471  | 235    | 1998 | SA PEEBLES, L SUN, RL KUCZKOWSKI, LM NXUMALO, TA FORD                                   |                                     |
| BF3    | (CH2CH2CH)CH3    | I      | JPCA  | 105  | 9058   | 2001 | GP EVERAERT, WA HERREBOUT, BJ van der VEKEN {methylcyclopropane}                        |                                     |
| CO2    | CO               | Imw    | JCP   | 91   | 4440   | 1989 | AC LEGON, AP SUCKLEY  |                                     |
| CO2    | CO               | I      | JCSFT | 86   | 1943   | 1990 | RW RANDALL, JPL SUMMERSGILL, BJ HOWARD  |                                     |
| CO2    | CO dipole        |        | JMSP  | 190  | 290    | 1998 | JS MUENTER, R BHATTACHARJEE   |                                     |
| CO2    | CO               | I      | JMSP  | 179  | 345    | 1996 | Y XU, ARW McKELLAR, BJ HOWARD   |                                     |
| CO2    | CO dipole        | T      | CPL   | 319  | 231    | 2000 | V KELLO, KP LAWLEY, ..., GHF DIERCKSEN  |                                     |
| CO2    | CO2              | Ra     | CPL   | 120  | 313    | 1985 | GA PUBANZ, M MARONCELLI, JW NIBLER  |                                     |
| CO2    | CO2              | I      | JCP   | 86   | 4341   | 1987 | KW JUCKS, ZS HUANG, RE MILLER, WJ LAFFERTY  |                                     |
| CO2    | CO2              | I      | JCP   | 88   | 2185   | 1988 | KW JUCKS, ZS HUANG, RE MILLER, GT FRASER, AS PINE, WJ LAFFERTY                          |                                     |
| CO2    | CO2              | I      | CPL   | 142  | 265    | 1987 | MA WALSH, TH ENGLAND, TR DYKE, BJ HOWARD  |                                     |
| CO2    | CO2              | I      | JCP   | 89   | 100    | 1988 | AS PINE, GT FRASER  |                                     |
| CO2    | CO2              | T      | TCA   | 78   | 133    | 1990 | RGA BONE, NC HANDY  |                                     |
| CO2    | CO2              | T      | JCP   | 94   | 2781   | 1991 | JS MUENTER  |                                     |
| CO2    | CO2              | T      | JCP   | 109  | 2169   | 1998 | S TSUZUKI, T UCHIMARU, M MIKAMI, K TANABE   |                                     |
| CO2    | CO2              | T      | JCP   | 112  | 5070   | 2000 | H CHEN, JC LIGHT  |                                     |
| CO2    | (CO2)1,2         | T      | JCP   | 110  | 3785   | 1999 | R BUKOWSKI, J SADLEJ, ..., K SZALEWICZ, SA KUCHARSKI, HW WILLIAMS, BM RICE              |                                     |
| CO2    | (CO2)2           | I      | JCP   | 87   | 1502   | 1987 | GT FRASER, AS PINE, WJ LAFFERTY, RE MILLER  |                                     |
| CO2    | (CO2)2           | I      | JCP   | 89   | 100    | 1988 | AS PINE, GT FRASER  |                                     |
| CO2    | (CO2)2           | I      | JCP   | 103  | 7685   | 1995 | MJ WEIDA, JM SPERHAC, DJ NESBITT  |                                     |
| CO2    | (CO2)2           | I      | JCP   | 105  | 10210  | 1996 | MJ WEIDA, DJ NESBITT  |                                     |
| CO2    | OCS              | mw     | JCP   | 88   | 687    | 1988 | SE NOVICK, RD SUENRAM, FJ LOVAS   |                                     |
| (CO2)2 | OCS              | mw     | CPL   | 286  | 421    | 1998 | SA PEEBLES, RL KUCZKOWSKI   |                                     |
| (CO2)2 | OCS              | mw     | JCP   | 109  | 5276   | 1998 | SA PEEBLES, RL KUCZKOWSKI   |                                     |
| CO2    | (OCS)2           | mw     | JPCA  | 102  | 8091   | 1998 | SA PEEBLES, RL KUCZKOWSKI   |                                     |
| CO2    | H2CO             |        | JMSP  | 154  | 72     | 1992 | TA BLAKE, SE NOVICK, FJ LOVAS, RD SUENRAM   |                                     |
| CO2    | HCCH             | IM     | JCP   | 89   | 1245   | 1988 | DG PRICHARD, RN NANDI, JS MUENTER, BJ HOWARD  |                                     |
| CO2    | HCCH             |        | JCP   | 90   | 4048   | 1989 | JS MUENTER  |                                     |
| CO2    | HCCH             | T      | JCP   | 94   | 2781   | 1991 | JS MUENTER  |                                     |
| CO2    | HCCH             | T      | JPC   | 95   | 3519   | 1991 | CR LE SUEYR, AJ STONE, PW FOWLER  |                                     |
| (CO2)2 | HCCH etc         | T      | COL   | RE04 |        | 1994 | Z LI, JS MUENTER  |                                     |
| CO2    | C2H4             | I      | JCP   | 103  | 7788   | 1995 | RJ BEMISH, PA BLOCK, LG PEDERSEN, RE MILLER   |                                     |
| CO2    | C2H4             | I      | COL   | TL14 |        | 1995 | RJ BEMISH, PA BLOCK, RE MILLER  |                                     |
| CO2    | H2S              | M      | JCP   | 92   | 6408   | 1990 | JK RICE, LH COUDERT, K MATSUMURA, RD SUENRAM, FJ LOVAS, W STAHL, DJ PAULEY, SG KUKOLICH |                                     |
| CO2    | H2               | I      | JCP   | 122  | 174313 | '05  | ARW McKELLAR  |                                     |
| CO2    | SO2              | mw     | MP    | 88   | 255    | 1996 | L SUN, II IOANNOU, RL KUCZKOWSKI  |                                     |
| CO2    | SO3              | matrix | I     | JMSt | 608    | 147  | 2002  | A GIVAN, A LOEWENSCHUSS, CJ NIELSON |
| CO2    | H2SO4            | matrix | I     | JMSt | 608    | 147  | 2002  | A GIVAN, A LOEWENSCHUSS, CJ NIELSON |
| CO2    | N2O              | I      | JPC   | 100  | 17772  | 1996 | C DUTTON, A SAZONOV, RA BEAUDET   |                                     |
| CO2    | N2O              | mw     | JCP   | 108  | 3955   | 1998 | HO LEUNG  |                                     |
| CO2    | N2O              | mw     | JMSP  | 196  | 149    | 1999 | MD MARSHALL, HO LEUNG {CO2--15^N-14^N-O}  |                                     |
| (CO2)2 | N2O              | mw     | MP    | 96   | 1355   | 1999 | RA PEEBLES, SA PEEBLES, RL KUCZKOWSKI   |                                     |

|        |                |      |      |      |        |  |  |
|--------|----------------|------|------|------|--------|--|--|
| CO2    | CS2            | I    | JPCA | 102  | 6904   | 1998   | C DUTTON, DA DOWS, ..., RA BEAUDET                                   |
| CO2    | C6H5NH2        | mw   | JMSP | 198  | 263    | 1999   | M HAEKE, W STAHL {aniline}   |
| CO2    | c-C7H5OOH      | LIF  | JPCA | 103  | 8389   | 1999   | VJ MACKENZIE, MZ ZGIERSKI, RP STEER {tropolone}                      |
| CO2    | C14H8CN        | RCS  | JPCA | 105  | 4781   | 2001   | K EGASHIRA, Y OHSHIMA, O KAJIMOTO {9-cyanoanthracene}                |
| CO2    | CH3OH          | mw   | JMSP | 239  | 94     | 2006   | VV ILYUSHIN, FJ LOVAS, DF PLUSQUELLIC                                |
| CO2    | HCF3           | mw   | JMSP | 250  | 1      | 2008   | MM SERAFIN, RA PEEBLES, SA PEEBLES                                   |
| CO2    | CH2(O)CH2      | mw   | JPCA |      |        | 2012   | Y KAWASHIMA, A SATO, Y ORITA {ethylene oxide}                        |
| CO2    | CH2(S)CH2      | mw   | JPCA |      |        | 2012   | Y KAWASHIMA, A SATO, Y ORITA {ethylene sulfide}                      |
| CO2    | HCCCN          | I    | JMSP | 180  | 1      | 1996   | X YANG, RZ PEARSON, G SCOLES   |
| CO2n   | Fe+            | I    | CPL  | 349  | 451    | 2001   | G GREGOIRE, J VALASQUEZ, MA DUNCAN                                   |
| CO     | CH2(O)CH2      | mw   | JPCA |      |        | 2012   | Y KAWASHIMA, A SATO, Y ORITA {ethylene oxide}                        |
| CO     | CH2(S)CH2      | mw   | JPCA |      |        | 2012   | Y KAWASHIMA, A SATO, Y ORITA {ethylene sulfide}                      |
| OCS    | OCS            | I    | MP   | 69   | 839    | 1990   | RW RANDALL, JM WILKE, BJ HOWARD, JS MUENTER                          |
| OCS    | OCS            | T?   | JMSt | 247  | 89     | 1991   | AA DEAKIN, SH WALMSLEY   |
| OCS    | OCS            | T    | CPL  | 206  | 260    | 1993   | RGA BONE   |
| OCS    | OCS polar      | I    | JCP  | 126  | 071102 | '07  | M AFSHARI, M DEGHANI, Z ABUSARA, N MOAZZEN-AHMADI, ARW McKELLAR      |
| OCS    | OCS polar      | mw   | JCP  | 126  | 101101 | '07  | AJ MINEI, SE NOVICK  |
| OCS    | OCS            | I    | CPL  | 437  | 23     | 2007   | M AFSHARI, Z ABUSARA, M DEGHANI, N MOAZZEN-AHMADI, ARW McKELLAR      |
| OCS    | (OCS)2         | mw   | JPCA | 103  | 6344   | 1999   | RA PEEBLES, RL KUCZKOWSKI  |
| OCS    | C6H6           | mw   | BBPC | 99   | 434    | 1995   | U DAHMEN, H DREIZLER, W STAHL  |
| OCS    | HCCH           | mw   | JPCA | 103  | 3884   | 1999   | SA PEEBLES, RL KUCZKOWSKI  |
| OCS    | HCCH           | mw   | CPL  | 312  | 357    | 1999   | SA PEEBLES, RL KUCZKOWSKI  |
| OCS    | CH4            | MP   | 100  | 2679 | 2002   | JPI HEARN, BJ HOWARD                                       |  |
| (OCS)2 | HCCH           | mw   | CPL  | 308  | 21     | 1999   | SA PEEBLES, RL KUCZKOWSKI  |
| (OCS)2 | HCCH           | mw   | JCP  | 111  | 10511  | 1999   | SA PEEBLES, RL KUCZKOWSKI  |
| (OCS)2 | C2H4           | mw   | JMSt | 612  | 261    | 2002   | RA PEEBLES, SA PEEBLES, RL KUCZKOWSKI                                |
| SO2    | SO2            | JCP  | 83   | 945  | 1985   | DD NELSON, GT FRASER, W KLEMPERER                          |  |
| SO2    | SO2            | JCP  | 94   | 6956 | 1991   | A TALEB-BENDIAB, KW HILLIG II, RL KUCZKOWSKI               |  |
| SO2    | H2S            | CPL  | 132  | 67   | 1986   | DJ PAULEY, RE BUMGARNER, SG KUKOLICH                       |  |
| SO2    | H2S            | JCP  | 87   | 3749 | 1987   | RE BUMGARNER, DJ PAULEY, SG KUKOLICH                       |  |
| SO2    | H2S            | JCP  | 91   | 5887 | 1987   | K MATSUMURA, FJ LOVAS, RD SUENRAM                          |  |
| SO2    | H2S            | JCP  | 93   | 871  | 1990   | SG KUKOLICH, DJ PAULEY                                     |  |
| SO2    | CS2            | mw   | JCP  | 110  | 6804   | 1999   | SA PEEBLES, L SUN, RL KUCZKOWSKI                                     |
| SO2    | (CH3)3N        | M    | CoI  |      |        | 1989   | JJ OH, MS LABARGE, JA MATOS, KW HILLIG II, RL KUCZKOWSKI             |
| SO2    | C2H4           | M    | JCP  | 93   | 7030   | 1990   | AM ANDREWS, A TALEB-BENDIAB, MS LABARGE, KW HILLIG II, RL KUCZKOWSKI |
| SO2    | C2H4 int rot   | T    | JCP  | 102  | 4184   | 1995   | SM RESENDE, WB DE ALMEIDA  |
| SO2    | C2H4           | T    | JCP  | 110  | 377    | 1999   | VM RAYON, JA SORDO   |
| SO2    | CH2CHCHCH2     | mw   | JACS | 115  | 5723   | 1993   | L-W XU, A TALEB-BENDIAB, L NEMES, RL KUCZKOWSKI                      |
| SO2    | C6H6           | M    | CPL  | 159  | 559    | 1989   | MS LABARGE, JJ OH, KW HILLIG II, RL KUCZKOWSKI                       |
| SO2    | C6H6           | JCP  | 97   | 2996 | 1992   | A TALEB-BENDIAB, KW HILLIG II, RL KUCZKOWSKI               |  |
| SO2    | C6H5F          | mw   | JMSt | 376  | 1      | 1996   | RJ WILSON, RL KUCZKOWSKI   |
| SO2    | CH3C6H5        | JCP  | 98   | 3627 | 1993   | A TALEB-BENDIAB, KW HILLIG II, RL KUCZKOWSKI               |  |
| SO2    | CH2CHCH3       | mw   | JCP  | 100  | 1      | 1994   | LW XU, RL KUCZKOWSKI   |
| SO2    | CH3CCH         | mw   | JCP  | 101  | 6512   | 1994   | XQ TAN, LW XU, MJ TUBERGEN, RL KUCZKOWSKI                            |
| SO2    | C5H5N          | M    | CPL  | 159  | 559    | 1989   | MS LABARGE, JJ OH, KW HILLIG II, RL KUCZKOWSKI {pyridine}            |
| SO2    | (CH3)2NH       | CoI  |      |      |        | 1990   | JJ OH, KW HILLIG II, RL KUCZKOWSKI                                   |
| SO2    | (CH3)2O        | InO  | 30   | 4583 | 1991   | JJ OH, KW HILLIG II, RL KUCZKOWSKI                         |  |
| SO2    | HCCH           | M    | JCP  | 94   | 6947   | 1991   | AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI, AC LEGON, NW HOWARD         |
| SO2    | (CH2)3         | M    | JCP  | 96   | 1784   | 1992   | AM ANDREWS, KW HILLIG II, RL KUCZKOWSKI                              |
| SO2    | c-(CH2)3       | T    | JCP  | 110  | 377    | 1999   | VM RAYON, JA SORDO   |
| SO2    | C4H4O          | JMSP | 153  | 497  | 1992   | JJ OH, LW XU, A TALEB-BENDIAB, KW HILLIG II, RL KUCZKOWSKI |  |
| SO2    | N2             | IM   | JCP  | 97   | 832    | 1992   | YD JUANG, MA WALSH, AK LEWIN, TR DYKE                                |
| SO2    | O2             | mw   |      |      |        | 1996   | C LUGEZ, ARH WALKER, RD SUENRAM, JT HOUGEN, GT FRAZER, W FAWZY       |
| SO2    | CH3OH          | mw   | JCP  | 103  | 6440   | 1995   | L SUN, XQ TAN, JJ OH, RL KUCZKOWSKI                                  |
| SO2    | N2O            | mw   | JPCA |      |        | 2000   | RA PEEBLES, RL KUCZKOWSKI  |
| SO2    | (N2O)2         | mw   | JCP  | 112  | 8839   | 2000   | RA PEEBLES, RL KUCZKOWSKI  |
| N2O    | N2O            | I    | JCP  | 89   | 5408   | 1988   | ZS HUANG, RE MILLER  |
| N2O    | N2O            | I    | CoI  |      |        | 1987   | M GAUTHER, PA HACKETT  |
| N2O    | N2O            | I    | CPL  | 152  | 294    | 1988   | Y OHSHIMA, Y MATSUMOTO, M TAKAMI, K KUCHITSU                         |
| N2O    | N2O            | I    | MP   | 91   | 689    | 1997   | H-B QIAN, W HERREBOUT, BJ HOWARD                                     |
| N2O    | N2O polar      | I    | JCP  | 126  | 164310 | '07  | M DEGHANI, M AFSHARI, Z ABUSARA, N MOAZZEN-AHMADI, ARW McKELLAR      |
| N2O    | N2O polar      | mw   | JMSP | 251  | 210    | 2008   | NR WALKER, AJ MINEI, SE NOVICK, AC LEGON                             |
| N2O    | N2O nonpolar   | I    | JCP  | 136  | 124308 | '12  | M REZAEI, KH MICHAELIAN, N MOAZZEN-AHMADI                            |
| N2O    | (N2O)2         | I    | JCP  | 108  | 436    | 1998   | RE MILLER, L PEDERSEN  |
| N2O    | HCCH           | I    | JCP  | 95   | 1537   | 1991   | TA HU, L HONG SUN, JS MUENTER  |
| N2O    | HCCH           | mw   | JCP  | 107  | 2232   | 1997   | HO LEUNG   |
| N2O    | O2             | I    | COL  | 92   | ME10   | 1992   | SW BUNTE, YS LIN, C WITTIG, RA BEAUDET                               |
| N2O    | O2 hamiltonian | T    | JCP  | 107  | 7651   | 1997   | H-B QIAN, SJ LOW, D SECCOMBE, BJ HOWARD                              |
| N2O    | O2             | mw   | JCP  | 107  | 7658   | 1997   | H-B QIAN, D SECCOMBE, BJ HOWARD                                      |
| N2O    | O2 hamiltonian | T    | JCP  | 109  | 348    | 1998   | WM FAWZY {comment on Qian et al}                                     |
| N2O    | CH4            | I    | COL  | 92   | WG11   | 1992   | YS LIN, C WITTIG, RA BEAUDET   |
| N2O    | H2O            | JCP  | 97   | 2861 | 1992   | D ZOLANDZ, D YARON, KI PETERSON, W KLEMPERER               |  |
| N2O    | C2H4           | I&T  | JCP  | 104  | 4411   | 1996   | RJ BEMISH, W RHEE, LG PEDERSEN, RE MILLER                            |
| N2O    | OCS            | mw   | JCP  | 114  | 4829   | 2001   | HO LEUNG, AM OSOWSKI, OA OYEYEMI                                     |

|                      |                            |      |      |      |       |      |   |
|----------------------|----------------------------|------|------|------|-------|------|---|
| N2O                  | OCS                        | T    | CPL  | 348  | 126   | 2001 | MJ WOJCIK, M BOCZAR, TA FORD  |
| N2O                  | CH3OCH3                    | mw   | JPCA |      |       | 2008 | K YAMONOU, Y TATAMITANI, H KANNO, T OGATA   |
| H2CO                 | HCCH                       | M    | JCP  | 88   | 6793  | 1988 | NW HOWARD, AC LEGON   |
| H2CO                 | H2CO                       | M    | JCP  | 92   | 891   | 1990 | FJ LOVAS, RD SUENRAM, LH COUDERT, TA BLAKE, KJ GRANT, SE NOVICK                               |
| H2CO                 | H2CO                       | I    | CPL  | 349  | 562   | 2001 | MV VERNER, O KUHN, JM BOWMAN  |
| CH3OH                | NH2CHO                     |      | JCP  | 88   | ???   | 1988 | FJ LOVAS, RD SUENRAM, GT FRASER, CW GILLIES, J ZOZOM  |
| CH3OH                | CH3COCH3                   | I    | COL  | FC05 |       | 1994 | WD STORK, CT LAUSH, JM LISY   |
| CH3OH                | (CH2)3                     | mw   | JMSt | 413  | 255   | 1997 | SE FOREST, SA PEEBLES, L SUN, AM ANDREWS, RL KUCZKOWSKI                                       |
| CH3OH                | CH3OH                      | mw   | JMSP | 185  | 98    | 1997 | FJ LOVAS, H HARTWIG   |
| CH3OH                | CH3OH                      | mw   | JMSP | 194  | 95    | 1999 | CL LUGER, FJ LOVAS, JT HOUGEN, N OHASHI   |
| CH3OH                | (CH3OH)2                   | T    | JCP  | 111  | 3027  | 1999 | GS TSCHUMPER, JM GONZALES, HF SCHAEFER III  |
| CH3OH                | (CH3OH) <sub>n</sub> {1-3} | ICRD | JCP  | 110  | 4258  | 1999 | RA PROVENCAL, JB PAUL, K ROTH, C CHAPO, RN CASAES, RJ SAYKALLY, GS TSCHUMPER, HF SCHAEFER III |
| CH3OH                | C6H5OH                     | E    | COL  | TH02 |       | 1995 | M SCHMITT, U HENRICHES, H MULLER, M GERHARDS, K KLEINERMANN                                   |
| CH3OH                | C6H5OH                     | E    | PCCP | 5    | 4114  | 2003 | A WESTPHAL, C JACOBY, C RATZER, M SCHMITT   |
| CH3OH                | (CH3)3N                    | mw   | JMSP | 177  | 181   | 1996 | X-Q TAN, II IOANNOU, KB FOLTZ, RL KUCZKOWSKI  |
| CH3OH                | C6H5NH2                    | mw   | JMSP | 198  | 263   | 1999 | M HAECKEL, W STAHL {aniline}  |
| CH3OH                | H2COH                      | mw   | JMSP | 239  | 94    | 2006 | VV ILYUSHIN, FJ LOVAS, DF PLUSQUELLIC   |
| (CH3OH) <sub>n</sub> | c-C6H5CN n=1-3             | IRa  | JCP  | 110  | 9504  | 1999 | S ISHIKAWA, T EBATA, N MIKAMI {benzonitrile}  |
| CH3CN                | HCCH                       |      | JCP  | 85   | 6898  | 1986 | NW HOWARD, AC LEGON   |
| CH3CN                | SO3                        | mw   | COL  | TB08 |       | 1995 | WA BURNS, JA PHILLIPS, M CANAGARATNA, H GOODFRIEND, KR LEOPOLD                                |
| CH3CN                | F2                         | mw   | CPL  | 260  | 388   | 1996 | G COTTI, SA COOKE, CM EVANS, JH HOLLOWAY, AC LEGON  |
| (CH3)2NH             | (CH2)3                     | mw   | JACS | 118  | 217   | 1996 | SE FOREST, RL KUCZKOWSKI  |
| (CH3)3N              | (CH2)3                     | mw   | JACS | 118  | 217   | 1996 | SE FOREST, RL KUCZKOWSKI  |
| (CH3)3N              | H2S                        | mw   | JCP  | 107  | 2227  | 1997 | MJ TUBERGEN, JE FLAD, JE DEL BENE   |
| (CH3)3N              | SO3                        | mw   | InC  | 39   | 37    | 2000 | DL FIACCO, A TORO, KR LEOPOLD   |
| HCCCN                | SO3                        | mw   | JMSP | 212  | 213   | 2002 | SW HUNT, DL FIACCO, M CRADDOCK, KR LEOPOLD  |
| HCCH                 | HCCH                       | IM   | JCP  | 89   | 115   | 1988 | DG PRICHARD, RN NANDI, JS MUENTER   |
| HCCH                 | HCCH                       | I    | CPL  | 88   | 1     | 1988 | Y OHSHIMA, Y MATSUMOTO, M TAKAMI, K KUCHITSU  |
| HCCH                 | HCCH                       | I    | JCP  | 89   | 6028  | 1988 | GT FRASER, RD SUENRAM, FJ LOVAS, AS PINE, JT HOUGEN, WJ LAFFERTY, JS MUENTER                  |
| DCCD                 | DCCD                       |      | JCP  |      |       | 1992 | RL BHATTACHARJEE, JS MUENTER, LH COUDERT,   |
| HCCH                 | HCCH                       | T    | JPC  | 95   | 3519  | 1991 | CR LE SUEYR, AJ STONE, PW FOWLER  |
| HCCH                 | HCCH                       | T    | JCP  | 94   | 2781  | 1991 | JS MUENTER  |
| HCCH                 | HCCH ang/r tunn            |      | JCP  | 98   | 988   | 1993 | II SUNI, W KLEMPERER  |
| HCCH                 | HCCH                       | T    | CP   | 206  | 1     | 1996 | SM RESENDE, WB De ALMEIDA   |
| HCCH                 | DCCD etc                   |      | JMSP | 150  | 576   | 1991 | K MATSUMURA, FJ LOVAS, RD SUENRAM   |
| DCCD                 | DCCD hyperfine             |      | JCP  | 97   | 8850  | 1992 | RL BHATTACHARJEE, JS MUENTER, LH COUDERT  |
| HCCH                 | HCCH                       | T    | JPCA | 103  |       | 1999 | A KARPEN  |
| HCCH                 | (HCCH)2                    | I    | CPL  | 135  | 9     | 1987 | D PRICHARD, JS MUENTER, BJ HOWARD   |
| (HCCH)2              | (HCCH)2                    | IM   | CPL  | 151  | 309   | 1988 | GW BRYANT, DF EGGERS, RO WATTS  |
| HCCH                 | CO                         | IM   | JCP  | 90   | 6049  | 1989 | MD MARSHALL, DG PRICHARD, JS MUENTER  |
| HCCH                 | CO                         | I    | COL  | ME13 |       | 1991 | MD MARSHALL, RE MILLER  |
| HCCH                 | CO                         | T    | CPL  | 182  | 551   | 1991 | SAC MCDOWELL, AD BUCKINGHAM   |
| HCCH                 | CO                         |      | CPL  | 188  | 232   | 1992 | MA ROEHRIG, SG KUKOLICH   |
| HCCH                 | CO                         |      | JCP  | 97   | 1619  | 1992 | TC GERMANN, SL TSCHOPP, HS GUTOWSKY   |
| HCCH                 | CO                         | I    | JMSP | 158  | 306   | 1993 | RD BECK, AG MAKI, SH TSENG, RO WATTS  |
| HCCH                 | CO                         | I    | JMSP | 194  | 281   | 1999 | JA ANSTEY, MD BROOKES, ARW McKELLAR   |
| HCCD                 | CO                         | I    | JMSP | 204  | 148   | 2000 | I HUNIG, L OUDEJANS, RE MILLER  |
| HCCH                 | CO2                        | I    | CP   | 132  | 185   | 1989 | ZS HUANG, RE MILLER   |
| HCCH                 | H2CCO                      | m    | JACS | 115  | 9253  | 1993 | JZ GILLES, CW GILLES, FJ LOVAS, RD SUENRAM  |
| HCCH                 | HONC                       |      | COL  | 92   | RB08  | 1992 | CW GILLES, JZ GILLES, FJ LOVAS, RD SUENRAM, K HERBERT   |
| HCCH                 | HCCCN                      | I    | JCP  | 105  | 10725 | 1996 | X YANG, RZ PEARSON, KK LEHMANN, G SCOLES  |
| HCCH                 | Cl2                        | T    | MP   | 91   | 635   | 1997 | SM RESENDE, WB DeALMEIDA  |
| HCCH                 | Br2                        | mw   | CPL  | 350  | 39    | 2001 | JB DAVEY, AC LEGON  |
| HCCH                 | (CH3)3N                    | mw   | JMSt | 189  | 137   | 1988 | AC LEGON, CA REGO   |
| (HCCH)1,2            | C6H6                       | E    | JCP  | 110  | 9081  | 1999 | MY SHELLY, H-L DAI, T TROXLER   |
| HC4H                 | HC4H                       | T    | JPCA | 103  |       | 1999 | A KARPEN  |
| C2H4                 | H2CCO                      | m    | JACS | 116  | 5285  | 1994 | FJ LOVAS, RD SUENRAM, CW GILLIES, JZ GILLIES  |
| C2H4                 | C2H4                       | I    | JCP  | 87   | 873   | 1987 | KGH BALDWIN, RO WATTS   |
| C2H4                 | C2H4                       | T    | JCP  | 89   | 3970  | 1988 | SR HAIR, JA BESWICK, KC JANDA   |
| C2H4                 | C2H4                       | S    | CPL  | 144  | 396   | 1988 | U BECK, CH LAUENSTEIN, A RUDOLPH, B HEIJMEN, S STOLTE, J RUESS                                |
| C2H4                 | C2H4                       | I    | JCP  | 102  | 3993  | 1995 | MC CHAN, PA BLOCK, RE MILLER  |
| C2H4                 | HCCH                       | mI   | CP   | 163  | 91    | 1992 | GT FRASER, FJ LOVAS, RD SUENRAM, JZ GILLIES, CW GILLIES, PW FOWLER, Z KISIEL                  |
| C2H4                 | HCNO                       |      |      |      |       | 1991 | RD SUENRAM, FJ LOVAS  |
| C2H4                 | N2O                        | I    | COL  | TL13 |       | 1995 | RJ BEMISH, W RHEE, RE MILLER  |
| C2H4                 | ClF                        | mw   | CPL  | 250  | 567   | 1996 | JH HOLLOWAY, AC LEGON   |
| C2H4                 | H2S                        | mw   | CPL  | 393  | 22    | 2004 | M GOSWAMI, PK MANDAL, DJ RAMDASS, E ARUNAN  |
| O2                   | O2                         | T    | JCP  | 87   | 5346  | 1987 | A VAN DER VOIRD, G BROCKS   |
| O2                   | O2                         | T    | JCP  | 108  | 3566  | 1998 | D LAUVERGNAT, DC CLARY  |
| O2                   | O2                         | E    | CPL  | 288  | 734   | 1998 | A CAMPARGUE, L BIENNIER, ..., R BACIS   |
| H2S                  | H2S                        |      | Col  |      |       | 1988 | FJ LOVAS, RD SUENRAM, LH COUDERT  |
| H2S                  | AgI                        | mw   | CPL  |      |       | 2012 | SZ RIAZ, SL STEPHENS, W MIZUKAMI, DP TEW, NR WALKER, AC LEGON                                 |

|           |                |      |      |      |        |      |  |
|-----------|----------------|------|------|------|--------|------|--|
| H2S       | AgCl           | mw   | ACI  | 49   | 181    | 2010 | SJ HARRIS, AC LEGON, NR WALKER, DE WHEATLY   |
| O3        | C2H4           | M    | JACS | 111  | 3073   | 1989 | JZ GILLES, CW GILLES, RD SUENRAM, FJ LOVAS, W STAHL  |
| O3        | C2H4           | M    | JACS | 113  | 2412   | 1991 | CW GILLES, JZ GILLES, RD SUENRAM, FJ LOVAS, E KRAKA, D CREMER                                      |
| O3        | C2H2           | M    | CoI  |      |        | 1989 | JZ GILLES, CW GILLES, K MATSUMURA, RD SUENRAM, FJ LOVAS  |
| O3        | CH4            | mw   | JCP  | 113  | 2139   | 2000 | AR HIGHT WALKER, GT FRASER, RD SUENRAM, FJ LOVAS   |
| Na        | H2O            | ZEKE | JCP  | 108  | 4817   | 1998 | K WANG, DA RODHAM, V McKOY, GA BLAKE   |
| Na        | HF             | T    | JCP  | 110  | 5634   | 1999 | M TOPALER, P PIECUCH, DG TRUHLAR   |
| Hg        | OCS            | M    | JCP  | 94   | 6989   | 1991 | M IIDA, Y OHSIMA, Y ENDO   |
| Hg        | CO2            | M    | JCP  | 95   | 4772   | 1991 | M IIDA, Y OHSIMA, Y ENDO   |
| Hg        | HCN            |      | COL  | 92   | TH02   | 1992 | T EMILSSON, HS GUTOWSKY  |
| DCOOH     | DCOOH tunnel   | I    | JCP  | 117  | 7162   | 2002 | F MADEJA, M HAVENITH {formic acid dimer tunneling}   |
| C6H5OH    | C6H5OH         | E    | JCP  | 96   | 2585   | 1992 | LL CONNELL, SM OHLIN, PW JOIREMAN, TC CORCORAN, PM FELKER  |
| C6H5OH    | C6H5OH         | E    | JCP  | 103  | 9918   | 1995 | M SCHMITT, U HENRICH, H MULLER, K KLEINERMANN  |
| C6H5OH    | C6H5OH         | RCS  | JPCA | 105  | 5679   | 2001 | A WEICHERT, C RIEN, B BRUTSCHY   |
| HCCCN     | HCCCN          | I    | JCP  | 99   | 876    | 1993 | ERTH KERSTEL, G SCOLES, X YANG   |
| HCCCN     | HCCCN          | T    | CPL  | 285  | 198    | 1998 | JA PLATTS, ST HOWARD, IA FALLIS  |
| HCCCN     | (HCCCN)2       | I    | JCP  | 103  | 8828   | 1995 | X YANG, ERTH KERSTEL, G SCOLES, RJ BEMISH, RE MILLER   |
| HCCCN     | (HCCCN)3       | I    | JCP  | 103  | 8828   | 1995 | X YANG, ERTH KERSTEL, G SCOLES, RJ BEMISH, RE MILLER   |
| HCCCN     | BF3            | I    | JCP  | 101  | 2762   | 1994 | ERTH KERSTEL, BH PATE, TF MENTEL, X YANG, G SCOLES   |
| C6H6      | C6H6           | M    | JCP  | 98   | 4294   | 1993 | E ARUNAN, HS GUTOWSKY  |
| C6H6      | C6H6           | Ra   | JCP  | 97   | 2189   | 1992 | BF HENSON, GV HARTLAND, VA VENTURO, P FELKER   |
| C6H6      | C6H6           | T    | JCP  | 97   | 3937   | 1993 | P HOBZA, HL SELZLE, EW SCHLAG  |
| C6H6      | C6H6           | Ra   | JCP  | 99   | 748    | 1993 | VA VENTURO, PM FELKER  |
| C6H6      | C6H6+          | T    | COL  | FC13 |        | 1995 | R SADYGOV, EC LIM  |
| C6H6      | C6H6           | Ra   | JCP  | 98   | 8361   | 1993 | BF HENSON, VA VENTURO, GV HARTLAND, PM FELKER  |
| C6H6      | C6H6           | T    | JCP  | 105  | 2780   | 1996 | R L JAFFE, GD SMITH  |
| C6H6      | C6H6           | T    | JCP  | 100  | 18790  | 1996 | P HOBZA, HL SELZLE, EW SCHLAG  |
| C6H6      | C6H6           | T    | JCP  | 111  | 572    | 1999 | V SPIRKO, O ENGVIST, P SOLDAN, HL SELZLE, EW SCHLAG, P HOBZA                                       |
| C6H6      | CHCl3          | E    | COL  | 93   | RF07   | 1993 | AJ GOTCH, RN PRIBBLE, F ENSMINGER, TS ZWIER  |
| C6H6      | H2CO           | T    | JCP  | 102  | 6812   | 1995 | PI NAGY, CW ULMER II, DA SMITH   |
| C6H6      | H2S            | mw   | JCP  | 117  | 9766   | 2002 | E ARUNAN, T EMILSSON, HS GUTOWSKY, GT FRASER, G de OLIVERIA, CE DYKSTRA                            |
| C6H6      | (CH3OH)m 1-6   | I    | JCP  | 106  | 2145   | 1997 | RN PRIBBLE, FC HAGEMASTER, TS ZWIER  |
| C6H6n     | Mn             | T    | CPL  | 350  | 393    | 2001 | GE FROUDAKISI, AN ANDROITS, M MENON  |
| C6H6n     | Ni             | T    | CPL  | 350  | 393    | 2001 | GE FROUDAKISI, AN ANDROITS, M MENON  |
| C6H6n     | V              | T    | CPL  | 350  | 393    | 2001 | GE FROUDAKISI, AN ANDROITS, M MENON  |
| NO2       | NO2            | I    | JCP  | 100  | 6993   | 1994 | JL DOMENECH, AM ANDREWS, SP BELOV, GT FRASER, WJ LAFFERTY  |
| CS2       | ?              | I    | COL  | 92   | TG09   | 1992 | MA WALSH, A LEWIN, TD JUANG, J CRUZAN, TR DYKE   |
| ICCH      | ICCH           | I    | JMSp | 162  | 342    | 1993 | ERT KERSTEL, KK LEHMANN, TF MENTEL, G SCOLES, JH TIMMERMANS  |
| CH3OH     | CH3OH          | T    | JMSp | 163  | 86     | 1994 | N OHASHI, JT HOUGEN  |
| CH3OH     | CH3OH          | mw   | JMSp | 170  | 4785   | 1995 | FJ LOVAS, SP BELOV, MY TRETYAKOV, W STAHL, RD SUENRAM  |
| CH3OH     | CH3OH          | T    | JMSp | 170  | 493    | 1995 | N OHASHI, JT HOUGEN  |
| CH4       | C6H7N          | ZEKE | JCP  | 97   | 2843   | 1992 | X ZHANG, JM SMITH, JL KNEE   |
| CH4       | C10H7F         | E    | JCP  | 102  | 6432   | 1995 | BB CHAMPAGNE, JF PFANSTIEL, DW PRATT, RC ULSH {1- and 2-fluoronaphthalene}                         |
| CH2F2     | CH2F2          | mw   | ACI  | 38   | 2924   | 1999 | W CAMINATI, S MELANDRI, ..., PG FAVERO   |
| CH2F2     | CH2F2          | mw   | JMSp | 612  | 255    | 2002 | S BLANCO, JC LOPEZ, A LESARRI, JL ALONSO   |
| C6H5OH    | C6H5OH         | ZEKE | JCP  | 98   | 1933   | 1993 | O DOPFER, G LEMBACH, TG WRIGHT, K MULLER-DETHLEFS  |
| C6H5OH    | c-(CH2)2O      | ET   | JCP  | 110  | 1463   | 1999 | A INAUEN, J HEWEL, S LEUTWYLER {oxirane}   |
| H2        | O (3°P)        | T    | JCP  | 108  | 4467   | 1998 | MH ALEXANDER   |
| H2        | OH             | T    | JCP  | 98   | 1843   | 1993 | SM MILLER, DC CLARY  |
| H2        | OH             | E    | JCP  | 104  | 6984   | 1996 | RA LOOMIS, RL SCHWARTZ, MI LESTER  |
| H2        | OH             | I    | CPL  | 273  | 18     | 1997 | RL SCHWARTZ, DT ANDERSON, MW TODD, MI LESTER   |
| H2        | OH             | I    | JCP  | 109  | 10707  | '98  | JM HOSSENLOPP, DT ANDERSON, MW TODD, MI LESTER   |
| H2        | HCO+           | IT   | JCP  | 102  | 5152   | 1995 | EJ BIESKE, SA NIZKORODOV, FR BENNETT, JP MAIER   |
| H2O2      | H2O2           | T    | JCP  | 100  | 2871   | 1994 | O MO, M YANEZ, I ROZAS, J ELGUERO  |
| CH3OCH3   | CH3OCH3        |      | JACS | 124  | 2737   | 2002 | Y TATAMITANI, B LIU, J SHIMADA, T OGATA, P OTTAVIANI, A MARIS, W CAMINATI, J ALONSO                |
| CH3OCH3   | CH2CHF         |      | JMSp | 222  | 102    | 2003 | Y TATAMITANI, T OGATA  |
| CH3OCH3   | CF2CHF         |      | JMSp | 222  | 102    | 2003 | Y TATAMITANI, T OGATA  |
| CH3OCH3   | OCS            | mw   | JCPA | 108  | 7372   | 2004 | JJ NEWBY, RA PEEBLES, SA PEEBLES   |
| CH3OCH3   | CO2            | mw   | JCPA | 1081 | 1234   | 2004 | JJ NEWBY, RA PEEBLES, SA PEEBLES   |
| CH3OCH3   | CS2            | mw   | CPL  | 410  | 77     | 2005 | SA PEEBLES, RA PEEBLES, JJ NEWBY, MM SERAFIN   |
| CH3OCH3   | HCCH           | mw   | JPCA | 109  | 5316   | 2005 | JJ NEWBY, MM SERAFIN, RA PEEBLES, SA PEEBLES   |
| CH3OCH3   | CO             | mw   | JCP  | 127  | 194302 | '07  | Y KAWASHIMA, Y MORITA, Y TATAMITANI, N OHASHI, E HIROTA  |
| CH3OCH3   | (CH3)3COH      | mw   | JMSp |      |        | 2011 | L EVANGELISIT, W CAMINATI {dimethylether tert-butylalcohol}  |
| (CH3)2NH  | (CH3)2NH       | mw   | JCP  | 100  | 3377   | 1994 | MJ TUBERGEN, RL KUCZKOWSKI   |
| NCCN      | NCCN           | T?   | MP   | 81   | 1397   | 1994 | WB DE ALMEIDA, SM RESENDE, HF DOS SANTOS   |
| PCCP      | PCCP           | T?   | MP   | 81   | 1397   | 1994 | WB DE ALMEIDA, SM RESENDE, HF DOS SANTOS   |
| (CH)4NH   | (CH)4NH        | mw   | JCP  | 106  | 504    | 1997 | G COLUMBERG, A BAUDER {pyrole}   |
| SiF4      | SiF4           | I    | JCP  | 102  | 3017   | 1995 | R-D URBAN, M TAKAMI  |
| I-        | CH3I           | D    | JCP  | 105  | 10416  | 1995 | CEH DESSENT, G BAILEY, MA JOHNSON  |
| (CH)3NCHN | (CH)3NCHN      | IT   | MP   | 91   | 513    | 1997 | W MCCARTHY, J SMETS, L ADAMOWICZ, AM PLOKHOTNICHENKO   |
| CF3COOH   | c-CH2CH2CHCOOH | mw   | ZNAT | 52   | 803    | 1997 | S ANTOLINEZ, H DREIZLER, V STORM, DH SUTTER, JL ALONZO   |
| C6H5COOH  | C6H5COOH       | E    | JCP  | 112  | 10890  | 2000 | {trifluoroacetic acid cyclopropanecarboxylic acid}<br>K REMMERS, WL MEERTS, I OZIER {benzoic acid} |

|   |   |     |                  |     |        |      |   |
|---|---|-----|------------------|-----|--------|------|---|
| HCOOH   | HCOOH   | I   | CPL              | 318 | 571    | 2000 | F ITO, T NAKANAGA   |
| HCOOH   | HCCCOOH   | mw  | JCP              | 132 | 201101 | '10  | AM DAILEY, PR BUNKER, SG KUKOLICH {formic acid, propiolic acid}   |
| HCOOH   | HCCCOOH   | mw  | JCP              |     |        | 2011 | AM DAILEY, KO DOUGLASS, LC SARKOZY, JL NEILL, MT MUCKLE, DP ZALESKI, BH PATE, SG KUKOLICH {formic acid, propiolic acid} |
| (CH <sub>3</sub> ) <sub>2</sub> O                             | CF <sub>2</sub> CH <sub>2</sub>                               | mw  | JMSp             |     |        | 2003 | Y TATAMITANI, T OGATA   |
| (CH <sub>3</sub> ) <sub>2</sub> O                             | CF <sub>2</sub> CHF   | mw  | JMSp             |     |        | 2003 | Y TATAMITANI, T OGATA   |
| (CH <sub>3</sub> ) <sub>2</sub> O                             | (CH <sub>3</sub> ) <sub>2</sub> O                             | mw  | JACS             | 124 | 2739   | 2002 | Y TATAMIYANI, B LIU, J SHIMADA, T OGATA, P OTTAVIANI, A MARIS, W CAMINATI, JL ALANSO                                    |
| C <sub>14</sub> H <sub>8</sub> CN                             | CH <sub>3</sub> CN  | RCS | JPCA             | 105 | 4781   | 2001 | K EGASHIRA, Y OHSHIMA, O KAJIMOTO {9-cyanoanthracene}   |
| C <sub>14</sub> H <sub>8</sub> CN                             | CF <sub>3</sub> H   | RCS | JPCA             | 105 | 4781   | 2001 | K EGASHIRA, Y OHSHIMA, O KAJIMOTO {9-cyanoanthracene}   |
| c-C <sub>7</sub> H <sub>5</sub> OOH                           | CF <sub>4</sub>   | LIF | CJP              | 79  | 483    | 2001 | VJ MacKENZIE. RP STEER {tropolone}  |
| c-C <sub>7</sub> H <sub>5</sub> OOH                           | CFH <sub>3</sub>  | LIF | CJP              | 79  | 483    | 2001 | VJ MacKENZIE. RP STEER {tropolone}  |
| c-C <sub>7</sub> H <sub>5</sub> OOH                           | CF <sub>2</sub> H <sub>2</sub>                                | LIF | CJP              | 79  | 483    | 2001 | VJ MacKENZIE. RP STEER {tropolone}  |
| c-C <sub>7</sub> H <sub>5</sub> OOH                           | CF <sub>3</sub> H   | LIF | CJP              | 79  | 483    | 2001 | VJ MacKENZIE. RP STEER {tropolone}  |
| C <sub>5</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub>   | C <sub>5</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub> - | T   | CP               | 273 | 51     | 2001 | AF JALBOUT, J SMETS, L ADAMOWICZ {thymine dimer anion}  |
| C <sub>4</sub> H <sub>10</sub> O                              | HOCHCH <sub>3</sub> C <sub>2</sub> H <sub>5</sub>             | mw  | CPL              | 348 | 343    | 2001 | AK KING, BJ HOWARD {butan-2-ol dimer}   |
| C <sub>3</sub> H <sub>8</sub>                                 | C <sub>3</sub> H <sub>8</sub>                                 | T   | JCP              | 116 | 1303   | 2002 | JP JALKANEN, R MAHLANEN, TA PAKKANEN, RL ROWLEY   |
| CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub> | CF <sub>3</sub> H   | LIF | JMS <sub>t</sub> | 605 | 255    | 2002 | B BALLESTEROS, E MARTINEZ, L SANTOS {p-methylaniline}   |
| CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub> | CH <sub>4</sub>   | LIF | JMS <sub>t</sub> | 605 | 255    | 2002 | B BALLESTEROS, E MARTINEZ, L SANTOS {p-methylaniline}   |
| CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> NH <sub>2</sub> | CF <sub>4</sub>   | LIF | JMS <sub>t</sub> | 605 | 255    | 2002 | B BALLESTEROS, E MARTINEZ, L SANTOS {p-methylaniline}   |
| HCOOH   | HCOOH   | I   | ARPC             | 60  | 263    | 2009 | O BIRER, M HAVENITH {formic acid dimer}   |
| HCOOH   | CH <sub>3</sub> COOH  | mw  | JCP              | 134 | 054316 | '11  | MCD TAYLOR, B OUYANG, BJ HOWARD {formic acid, acetic acid}  |

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#### Technique notation

|      |   |
|------|---|
| M    | - Not included in the 1989 review article by SEN, KRL, and WK. New references do not have this designation. |
| #    | - Not totally solved.   |
| I    | - IR or FIR, may also contain microwave work.   |
| ICRD | - Infrared cavity ringdown laser absorption   |
| E    | - Electronic  |
| LIF  | - Laser induced fluorescence  |
| Ra   | - Raman   |
| R    | - Review  |
| T    | - Theory  |
| D    | - Photo dissociation  |
| PE   | - Photoelectron   |
| ZEKE | - Zero electron kinetic energy PES  |
| RTPI | - Resonance-enhanced two photon ionization  |
| MATI | - Mass-analyzed threshold ionization  |
| mw   | - Microwave, either MBER or FT; When blank, this can usually be assumed                                     |
| m    | - Microwave, either MBER or FT; When blank, this can usually be assumed                                     |
| mm   | - millimeter wave, high frequency microwaves  |
| mwm  | - microwave-submillimeter double-resonance  |
| THz  | - terahertz laser spectroscopy  |
| VPre | - vibrational predissociation   |
| RCS  | - rotational coherence spectroscopy   |
| TOF  | - time of flight mass spectrometry, velocity map imaging  |
| Pre  | - predissociation   |

#### Reference abbreviations

|        |  |
|--------|--|
| ACI    | - ANGEW. CHEM. INT. ED. ENGL.  |
| ApJ    | - ASTROPHYSICAL JOURNAL  |
| APPA   | - ACTA PHYSICA POLONICA A  |
| ARPC   | - ANNU. REV. PHYS. CHEM.   |
| Bal    | - SYMPOSIUM AT REGIONAL ACS, Sept. 1986  |
| BBPC   | - BER. BUNSEN. PHY. CHEMIE   |
| CC     | - CHEM. COMM.  |
| CEJ    | - CHEM. EUR. J.  |
| CJP    | - CAN. J. PHYS.  |
| COL    | - OHIO STATE SPECTROSCOPY SYMPOSIUM, June 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994 |
| CP     | - CHEM. PHYS.  |
| CPC    | - CHEMPHYSICHEM  |
| CPL    | - CHEM. PHYS. LETT.  |
| CR     | - CHEM. REV.   |
| FDCS   | - FARADAY DISCUSS. CHEM. SOC.  |
| IISc   | - JOURNAL OF THE INDIAN INSTITUTE OF SCIENCE   |
| IRPC   | - INTERNATIONAL REVIEWS IN PHYSICAL CHEMISTRY  |
| InC    | - INORG. CHEM.   |
| JACS   | - J. AMER. CHEM. SOC.  |
| JCP    | - J. CHEM. PHYS.   |
| JCSCC  | - J. CHEM. SOC. CHEM. COMM.  |
| JCSFT  | - J. CHEM. SOC., FARADAY TRANS.  |
| JCSFT2 | - J. CHEM. SOC., FARADAY TRANS. 2  |
| JMSp   | - J. MOL. SPECTROSC.   |
| JMSt   | - J. MOL. STRUCT.  |
| JPC    | - J. PHYS. CHEM.   |
| JPCA   | - J. PHYS. CHEM. A   |
| Mar    | - NATO ADVANCED RESEARCH WORKSHOP, Sept. 1986  |
| MP     | - MOL. PHYS.   |
| NATU   | - NATURE   |

PCC - PHYS. CHEM. COMM.  
PCCP - PHYSICAL CHEMISTRY CHEMICAL PHYSICS  
PNAS - PROC. NAT. ACAD. SCI.  
PR - PHYS. REV.  
PRL - PHYS. REV. LETT.  
PRSL - PROC. ROY. SOC. (LONDON) A  
RSI - REV. SCI. INSTRU.  
SCI - SCIENCE  
TFS - TRANS. FARAD. SOC.  
ZNAT - ZEITSCHRIFT FUR NATURFORSCHUNG A