Harvard University
Department of Chemistry
12 Oxford Street
Cambridge, Massachusetts 02138
U.S.A.
Professor E. Bright Wilson

Michigan State University
Department of Chemistry
East Lansing, Michigan 48823
U.S.A.
Professor Richard H. Schwendeman

May 10, 1973

Dear Contributor:

This is the sixteenth microwave spectroscopy information letter and is being sent to those who contributed. We regret that it contains some inconsistencies due to errors in contributed lists, errors we were not able to correct.

NAME OF INSTITUTION- Allahabad University, Allahabad- India

NAME OF DEPARTMENT OR INSTITUTE- Physics Department

NAME OF WHOM QUERIES SHOULD BE ADDRESSED- Prof. Krishnaji/Dr.S.L.Srivastava

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$C_2F_3O_2H$ (CF_3COOH)	Trifluoro acetic acid	N.K.Narain	Work in Progress
m-C_6H_4FBr	m-fluoro bromo Benzene	N.K.Narain	Work in Progress
C_2F_3Br	Trifluoro bromo Ethylene	S.P.Srivastava	Work in Progress

2. Name of Institution: University College of North Wales, Bangor, Caerns, U.K.

Name of Department or Institute: School of Physical and Molecular Sciences.

Name to whom queries should be addressed: John Sheridan

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_3H_6O C_3H_5OD	cyclopropanol	J.N. Macdonald D. Norbury	$A_oB_oC_o$, A_1,B_1,C_1, & ΔE $v = o \rightarrow v = 1$, all for both species. μ for OD species
C_4H_8O	cyclobutanol	J.N. Macdonald D. Norbury	Tentative assignment of $v = o$ and $v = 1$ & ΔE $v = o \rightarrow v = 1$. Deuteration in progress.
$C_4H_6N_2$	3-methyl pyrazole 5-methyl pyrazole	S.L. Srivastava	Assignments for one tautomer
C_4H_5NO	5-methyl-isoxazole	S.L. Srivastava J.N. Macdonald	Continuing
$C_3H_4N_2$	imidazole	D. Christen	μ_b spectra: D-species: continuing for r_s structure
C_3H_4S	propargyl mercaptan	J. Sheridan O.L. Stiefvater	D.R. checks on assignments of doublets: continuing in collaboration with Monash Univ.
C_3H_3NO	isoxazole	P. Nösberger O.L. Stiefvater	Work to complete structure, centrifugal distortion and quadrupole coupling. Note in preparation about coupling tensor
$C_5H_6N_2$	3-amino pyridine 4-amino pyridine	D. Christen D.G. Lister D. Norbury	O^+ and O^- states of normal isotopic species assigned. Amine deuterated species in progress.
$C_6H_5BF_2$	phenyl boron difluoride	D. Christen D.G. Lister	assignment in progress.
C_4H_7NO	acetone cyanohydrin	D.G. Lister	(B+C) for normal and OD isotopic species. Analysis of μ_a lines in progress.
$C_3H_4O_2$	acrylic acid	D.G. Lister	Further intensity work finished: manuscript nearly ready.

Note in preparation

C_3H_5FO	propionyl fluoride	O.L. Stiefvater	DR-studies of structure and rotational isomerism well advanced
$C_3H_6O_2$	propionic acid	O.L. Stiefvater	
C_4H_8O	isobutyraldehyde	O.L. Stiefvater	
C_4H_7FO	isobutyryl fluoride	O.L. Stiefvater	
$C_4H_8O_2$	isobutyric acid	O.L. Stiefvater	Predominant rotamer assigned
$C_2H_3ClO_2$ ($ClCOOCH_3$)	methyl chloroformate	D. Lister N.L. Owen	Paper submitted for publication
C_7H_7FO	p-fluoroanisole	N.L. Owen	v = o and v = 1 states assigned, conformation determined; manuscript in preparation.
C_2H_4OS ($HCOSCH_3$)	methyl thiolformate	N.L. Owen (with M.C.L. Gerry U.B.C., Canada)	work in progress
$C_4H_4O_2$ ($HCOOCH_2CCH$)	propargyl formate	G.I.L.Jones N.L. Owen	work temporarily suspended
C_3H_8S	isopropyl mercaptan	J.H. Griffiths	Writing up
$C_2H_2N_2O$	2,4-oxadiazole	D. Norbury	Writing up
$C_2H_2N_2S$	2,4-thiadiazole	D. Norbury O.L. Stiefvater	Writing up
C_3F_4	perfluoropropyne	T.D. Summers	Writing up
$C_3H_3F_3O_2$	methyl trifluoroacetate	T.D. Summers	Writing up
$C_4H_6O_2$	cyclopropyl carboxylic acid	T.D. Summers O.L. Stiefvater	Writing up
$C_4H_6N_2$	N-methyl imidazole	H.U. Wenger	Writing up
C_4H_5NS	3-methyl isothiazole	H.U. Wenger	Work suspended

Name of Institution: UNIVERSITY OF BOLOGNA AND LABORATORIO DI SPETTROSCOPIA MOLECOLARE DEL C.N.R. - BOLOGNA - Italy

Name to Whom Queries Should be adressed: P.G. FAVERO - ISTITUTO CHIMICO "G. CIAMICIAN" VIA SELMI, 2 - BOLOGNA - ITALY

Formula	Name of Compound	Name of Investigator	Present Stage of Progress
$C_2H_6N_2O$	Dimethylnitros-amine	F. Scappini, in collaboration with Kiel	Structure and NQHFS
C_3H_4S	Propargyl mercaptan	F. Scappini A.M. Mirri	Excited torsional state analysis
		F. Scappini A.M. Mirri, in collaboration with Kiel	Stark effect
CH_3NHCl	N-chloromethyl-amine	A.M. Mirri W. Caminati	Internal rotation and NQHFS. In press
		W. Caminati A.M. Mirri R. Cervellati	Deuterated species investigation
NCl_3	Nitrogen trichloride	G. Cazzoli P.G. Favero	Structure determination
		G. Cazzoli A. Dal Borgo	Dipole moment and NQHFS
$C_6H_{11}Cl$	Cyclohexyl chloride	L. Ferretti D.Damiani	Rotational constants
$C_6H_{11}CN$	Cyclohexyl cyanide		Dipole moment and NQHFS.
$C_6H_{10}F_2$	Difluorocyclohexane		

Name of Institution University of Bristol

Name of Department or Institute Department of Physical Chemistry, Bristol BS8 1TS.

Name to Whom Queries Should be Addressed A. Peter Cox

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CH_3NO	Nitrosomethane	P.H. Turner	Isotonic work complete; centrifugal distortion in progress.
N_2O_3	Dinitrogen trioxide	D.J. Finnigan	Quadrupole coupling published.
CF_3NO_2	Trifluoronitromethane	P.R.R. Langridge-Smith	Isotopic work in Progress
C_5H_5In	Cyclopentadienyl indium	C. Roberts	Papers in preparation
C_5H_5Tl	Cyclopentadienyl thallium	C. Roberts	
C_5H_5NiNO	Cyclopentadienyl nickel nitrosyl	D.J. Finnigan	
C_8H_6	Phenyl acetylene	W.M. Stigliani I.C. Ewart	Structure nearly complete
$BF_5Si(SiF_3BF_2)$	Difluoro(trifluorosilyl) borane	T. Ogata	Assignment in progress
$C_7H_5F_3(C_6H_5CF_3)$	Benzotrifluoride	T. Ogata	Assignment in progress

Name of Institution Universidad de Buenos Aires, Facultad de Ciencias Exactas

Name of Department or Institute Departamento de Fisica

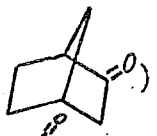
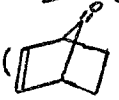
Name to Whom Queries Should Be Addressed T. Hartmann, Laboratorio de Microondas

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_6F_4H_2$	1,2,3,4 Tetrafluorbenzene	Tomas Hartmann	Spectrum assigned

6. Name of Institution California State University, San Diego; California 92115

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should be Addressed Dewitt Coffey, Jr.

FORMULA	NAME OF COMPOUND	PRESENT STAGE OF PROGRESS
$C_7H_{10}O$ ()	Bicyclo(2.2.1)heptan-2-one	Vibrational satellites assigned
C_7H_8O ()	Bicyclo(2.2.1)hepten-7-one	Spectrum assigned
C_7H_8O ()	Tricyclo(2.2.1.$0^{2,6}$)heptanone	Spectrum assigned

7. Name of Institution University of California, Santa Barbara

Name of Department or Institute Chemistry

Name to Whom Queries Should Be Addressed David O. Harris

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_7H_{10}O_3$	2,8,9 trioxadamantane	W. D. Slafer	In Press
$C_3H_6O_3P$	trimethyl phosphorous acid	W. D. Slafer	In Progress
$C_4H_7O_3P$	1-phospha 2,6,7 trioxa-bicyclo [2.2.2] octane	W. D. Slafer	Assigned Potential function in progress
$C_6H_{10}O_3$	4-methyl-2,6,7 trioxa-bicyclo [2.2.2] octane	W. D. Slafer	Assigned
$C_5H_8O_3$	2,6,7 trioxabicyclo [2.2.2] octane	W. D. Slafer	Synthesis in progress
C_4H_6O	Oxaspiropentane	W. D. Slafer A. D. English	Normal and 2 deuterated species assigned. ^{13}C work in progress
$C_3H_4F_2$	2,3 difluoropropene	A. D. English	Gauche rotamer assigned; potential function in progress

$C_7H_4FeO_3$	1,3 cyclobutadiene iron tricarbonyl	M. A. Revelli	In Progress
BaO	Barium Oxide	A. D. English R. W. Field T. Tanaka	Further microwave optical double resonance in progress; work on excited state progressing

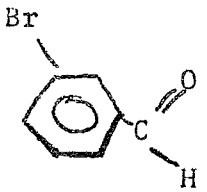
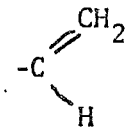
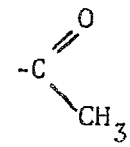
8. Name of Institution University of Cincinnati

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed Clarence H. Thomas

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_2H_4ClF (CH_3-$CHFCl$)	1,1-chlorofluoroethane	C. Thomas	Writing up
$C_2H_3Cl_2F$	1,1,1-dichlorofluoroethane	"	Spectrum assigned
$(CH_3)_2Te$	Dimethyl telluride	"	Q-branch assigned

9. Robert Bohn
Department of Chemistry
University of Connecticut
Storrs, Connecticut

	m-bromobenzaldehyde	Conformation	Low Resolution	Spectrum Observed
" 	" styrene	"	"	"
" 	" acetophenone	"	"	"

"	$-CH_2 - CH_3$	"	ethylbenzene	"	"	"
"	$-NH - CH_3$	"	N-methylaniline	"	"	"
"	$-O - CH_3$	"	anisole	"	"	"

10. Institution: UNIVERSITY OF COPENHAGEN
Department: Chemical Laboratory V
Address: H. C. Ørsted Institutet 5, Universitetsparken
DK-2100 Copenhagen DENMARK

FORMULA	COMPOUND	INVESTIGATOR	STATE OF PROGRESS
CH_3NO ($HCONH_2$)	formamide-CD, $-NHD$, $-ND_2$, and ^{15}N	Claus Nielsen Max Stubgaard +)G. O. Sørensen	Ground state reinvest. Exc. states assigned. Paper (with E. Hirota) nearly complete. Prep. of ^{13}C and ^{18}O species planned.
$C_3H_4N_2$	pyrazole	Dines Christen Ole Snerling +)Lise Nygaard +)G. O. Sørensen	Paper nearly complete.
$C_4H_2N_2$ ($NC-CH=CH-CN$)	maleonitrile	Peter Jansen +)Børge Bak	Abandoned.

$C_4H_{10}S$ $((CH_3)_3CSH)$	tert. butyl-mercaptan	+)T. Pedersen	Spectrum assigned.
C_5H_5N	pyridine	+)G. O. Sørensen J. L. Mahler N. R. Andersen	Paper nearly complete.
C_5H_5NO	pyridine N-oxide	Ole Snerling +)G. O. Sørensen	Ring-subst. species spectra assigned.
C_6H_5BrO	4-Br-phenol	+)N. W. Larsen	Paper nearly complete.
C_6H_5ClO	4-Cl-phenol	"	"
C_6H_5FO	4-F-phenol	"	"
C_6H_5FS	4-F-thiophenol-SD	+)N. W. Larsen +)T. Pedersen Leif Schulz	Spectrum assigned.
$C_6H_5NO_2$	nitrobenzene	Jens H. Høg +)G. O. Sørensen	Paper in progress.
C_6H_6O	phenol-OD	+)N. W. Larsen	Paper (with E. Mathier et al.) nearly complete.
	phenol-^{13}C	"	Paper nearly complete.
C_6H_6S	thiophenol " -SD	+)N. W. Larsen +)T. Pedersen Leif Schulz	Spectrum assigned.
C_6H_6Se	selenophenol " -SeD	+)N. W. Larsen +)T. Pedersen	Broad-band spectrum assigned.
C_6H_7N	aniline	Jens H. Høg +)N. W. Larsen	Paper (with D. G. Lister and J. K. Tyler) nearly complete.
C_7H_5N	phenylisocyanide 2-D- " 2,4-D_2- " 2,4,6-D_3- "	B. P. Van Eijck C. Kierkegaard +)Børge Bak	Spectra assigned, manuscript in preparation.

+) Staff member.

Name of Institution University of Freiburg

Name of Department or Institute Department of Physics

Name to Whom Queries Should Be Addressed H.D. Rudolph

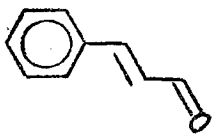
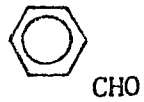
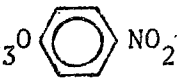
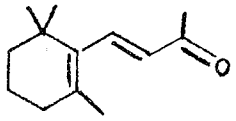
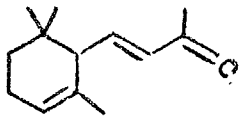
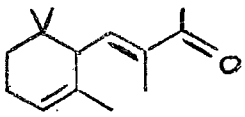
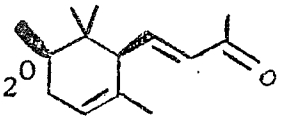
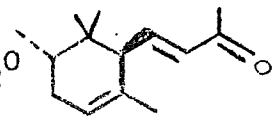
FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_2H_3NS (CD_3SCN)	d_3-methylthiocyanate	H.Schleser	PAM-, IAM- fittings to two excited torsional states
C_2H_6S ($(CD_3)_2S$)	d_6-dimethylsulfide	B.T. Tan	extension to paper in preparation
C_3H_7N (CH_2=$CHCH_2N_2$)	allylamine	I. Botskor in collaboration with Nancy	two N-gauche rotamers investigated, potential function for Ncis- Ngauche rotation, paper in preparation
C_4H_6O ($(CH_3)_2CCO$)	dimethylketene	K.P.R. Nair H.D. Rudolph in collaboration with Kiel	in press
C_5H_8 ($(CH_3)_2CCH_2$)	dimethylallene	J. Demaison in collaboration with Nancy	isotopic species
C_7H_7F ($CH_2DC_6H_4F$, $CHD_2C_6H_4F$)	αd_1-, α-d_2-orthofluorotoluene	D. Schwoch	internal rotation parameters being fitted to g.s.spectra
C_7H_7F ($CH_2DC_6H_4F$, $CHD_2C_6H_4F$)	α-d_1-,α-d_2-parafluorotoluene	H. Schleser	d_1:molecular parameters being fitted d_2:work commenced
C_7H_7Cl ($CH_3C_6H_4Cl$)	ortho-chlorotoluene	K.P.R. Nair	Cl 35, Cl 37-spectra assigned, HFS
C_7H_8 ($CH_2DC_6H_5$)	α-d_1-toluene	H. Schleser	molecular parameters being fitted
C_7H_8 ($CD_3C_6H_5$, $CH_3C_6H_4D$)	αd_3-toluene 2-,3-,4d-toluene	W.A.Kreiner B.T.Tan H.D.Rudolph	in press
C_8H_{10} ($(CH_3)_2C_6H_4$)	ortho-xylene	H.D.Rudolph K.Walzer I.Krutzik	in press

2. Name of Institution Freie Universität Berlin

Name of Department or Institute Institut für Molekülphysik

Name to Whom Queries Should Be Addressed Prof. Dr. R. Honerjäger
1000 Berlin 33
Boltzmannstraße 20

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
SiS	Silicon sulfide		Z.Naturforsch. 27a, 1566 (1972)
ClCs (CsCl)	Cesium chloride		Z.Naturforsch. 27a, 1516 (1972)
IK (KI)	Potassium iodide	J. Hoeft	to be published
AlBr	Aluminium bromide	E. Tiemann	"
AlI	Aluminium iodide	T. Törring	"
FI (IF)	Iodine fluoride		"
BaO	Barium oxide		remeasurements hyperfine structure rotational spectrum assigned in cooperation with National Bureau of Standards, Washington D.C.
S_2O	Disulfur oxide		
TlF	Thallium fluoride	R. Honerjäger R. Tischer	g_J-factor and magnetic susceptibility anisotropy
CsF	Cesium fluoride		
CsCl	Cesium chloride		
CsBr	Cesium bromide		g_J-factor upper limit of g_J
CsI	Cesium iodide		
SiS	Silicon sulphide		g_J-factor and magnetic susceptibility anisotropy
GeS	Germanium sulphide		
SnS	Tin sulphide		
PbS	Lead sulphide		

C_3H_7FO ($FCH_2CH_2CH_2OH$)	3-Fluoropropanol	M. Fuller	Ground state lines assigned for one rotamer, searching for second
$C_2H_3NO_2$ ($HN(CHO)_2$)	Formimide	W.E. Steinmetz	Normal and N deuterio species assigned, paper accepted by JACS
C_9H_8O 	Cinnamaldehyde	W.E. Steinmetz	Analysis of low resolution band spectrum, conformational analysis completed.
$C_8H_8O_2$ 	p-anisaldehyde	W.E. Steinmetz	Low resolution.
$C_8H_8O_2$ 	m-anisaldehyde	W.E. Steinmetz	"
C_8H_7NO 	p-anisonitrile	W.E. Steinmetz	"
$C_7H_7NO_3$ 	p-nitroanisole	W.E. Steinmetz	"
$C_{13}H_{20}O$ 	β-ionone	W.E. Steinmetz	"
$C_{13}H_{20}O$ 	α-ionone	W.E. Steinmetz	"
$C_{14}H_{22}O$ 	α-methylionone	W.E. Steinmetz	"
$C_{14}H_{22}O$ 	cis α-irone	W.E. Steinmetz	"
$C_{14}H_{22}O$ 	trans α-irone	W.E. Steinmetz	"

13. Name of Institution University of Göteborg

Name of Department or Institute Department of Medical Physics

Name to Whom Queries Should Be Addressed Hasse Karlsson

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$C_{10}H_7F$	1-Fluoro-naphthalene	Hasse Karlsson	Spectrum assigned, manus. in prep.

14. HARVARD UNIVERSITY

DEPARTMENT OF CHEMISTRY

E. Bright Wilson

C_4H_7Cl $(CH_2C(CH_3)CH_2Cl)$	iso-butenyl chloride	D.J. Finnigan	Ground state Spectra assigned for ^{35}Cl and ^{37}Cl isotopic species of gauche rotamer and ^{35}Cl species of cis rotamer. Analysis of vibrational satellites in progress.
C_2H_5NO (CH_3NHCHO)	N-methylformamide	D.J. Finnigan	Several Q-branch series assigned. Double-resonance search for R-branch lines in progress.
$C_2H_5NO_3$	ethyl nitrate	D. Scroggin J. Riveros	In manuscript
C_3H_4ClN $(ClCH_2CH_2CN)$	3-chloropropionitrile	I. Warren	In manuscript
C_4H_7N $(CH_3CH_2CH_2NC)$	n-propyl isocyanide	M. Fuller	Manuscript in preparation
C_3H_7ClO $(ClCH_2CH_2CH_2OH)$	3-Chloropropanol	M. Fuller	Ground state lines assigned for two rotamers.

$C_3H_4O_2$ (OCHCHCHOH)	malonaldehyde	Walter F. Rowe	83 lines in R-band spectrum of proton species identified; rotational constants of ground and two excited vibrational states obtained; deuterated species in progress.
C_2H_5NO (CH_3CONH_2)	Acetamide	Walter F. Rowe	9 lines in R-band spectrum of proton species identified; rotational constants of A torsional species and quadrupole coupling constants obtained.

Name of Institution HEWLETT-PACKARD CO.

Name of Department or Institute SCIENTIFIC INSTRUMENTS DIVISION

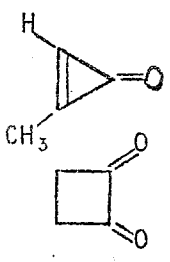
Name to Whom Queries Should Be Addressed LeRoy H. Scharpen

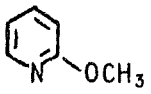
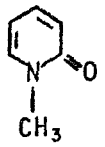
FORMULA*	NAME OF COMPOUND	PRESENT STAGE OF PROGRESS
$C_2H_4O_3$ ($CH_2OHCOOH$)	GLYCOLIC ACID	parent, $-CH_2OD$, and -COOD GROUND state assigned. v = 1 to 4 torsional and v' = 1 and v'' = 1 vib. energies measured, dipole determined. Manuscript in preparation.

Name of Institution University of Illinois

Name of Department of Institute Noyes Chemical Laboratory

Name to Whom Queries Should be Addressed W. H. Flygare

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
	methylcyclopropenone	C. L. Norris, T. Hoffman	tentative assignment
		C. Norris, J. Davidson	in progress

	2-methoxypyridine	C. Norris, A. Burnham	in progress
	N-methyl-2-pyridone	C. Norris, J. Davidson	in progress
		J. Cloyd	in progress

17. Name of Institution The University of Kansas

Name of Department or Institute Chemistry Department

Name to Whom Queries Should Be Addressed Marlin D. Harmony

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_6H_6	Benzvalene	Suenram	In press
C_6H_5D	6-Deutero fulvene	Suenram	In press
C_6H_8	Tricyclo[2.2.0.0]hexane	Suenram	Numerous lines measured
$C_5H_7N(C_4H_7CN)$	Cyanocyclobutane	Fong	In press
$CH_5NO(CH_3ONH_2)$	Methoxyamine	Johnson Fong	Nearly Completed
N_2D_4	Hydrazine-d_4	Bostrom	Underway
$C_3H_5NO(CH_3OCH_2CN)$	Methoxy acetonitrile	Parra	Underway

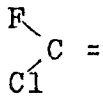
18. Name of Institution: University of Kiel
Name of Institute: Institut für Physikalische Chemie
Name to whom queries should be addressed: Manfred Winnewisser

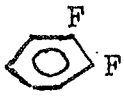
FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CDNO (DCNO)	Deuterofulminic acid	M. Winnewisser B. P. Winnewisser	Manuscript in preparation

CHNO (HNCO)	Isocyanic acid	M. Winnewisser G. Winnewisser	MMW spectrum of isotopic species in progress
CHNS (HNCS)	Isothiocyanic acid	M. Winnewisser	MMW spectrum in progress
C_2D_2O (D_2CCO)	Dideuteroketene	M. Winnewisser L. Nemes	MMW spectrum in progress
C_2H_3NO (CH_3CNO)	Methylfulmide	M. Winnewisser	MMW spectrum in progress
C_3H_4O (CH_2CHCHO)	Acrolein	M. winnewisser G. Winnewisser	Manuscript in preparation

Abteilung Chemische Physik
Institut für Physikalische Chemie
Universität Kiel
D - 23 K i e l, Olshausenstraße 40/60

Prof. Dr. H. D r e i z l e r

$C_2H_6N_2O$	$(CH_3)_2NNO$	Dimethylnitrosamine	Scappini Guarnieri Dreizler Rademacher Charpentier	Isotopic species Quadrupole coupling constants, excited states measured
$C_2H_6N_2O_2$	$(CH_3)_2NNO_2$	Dimethylnitramine	Guarnieri Scappini	Measurements in progress
COFCl		Carbonylfluorochloride	Guarnieri Scappini Hamer	Zeeman Studies
CH_3SCl	CH_3-S-Cl	Methane sulfenylchloride	Guarnieri Charpentier	Partial r_s-structure Manuscript in preparation Vibration-rotation interaction
HOCl	HOCl	Hypochlorous acid	Guarnieri Scappini	Zeeman-Studies
NOF	NOF	Nitrosylfluoride	Guarnieri Dreizler	Zeeman-Studies

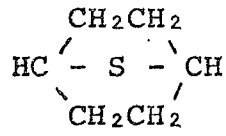
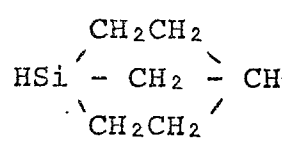
$C_2H_3D_3S_2$	CH_3SSCD_3	Dimethyldisulfide	Kuhler	Torsion-Vibrati-oninteraction
C_3H_5N	CH_3CH_2CN	Propionitrile	Mäder	Torsion-Vibratior interaction
$C_3H_3D_2N$	CH_3CD_2CN	—"—	Heise	Manuscript sub-mitted
C_2H_6Se	$(CH_3)_2Se$	Dimethylselenide	Legell Dreizler	Torsion-excited states
C_2H_3SN	CH_3SCN	Methylrhodanide	Andresen	Torsion-vibratior interaction. Manuscript in preparation
C_2H_4O	H_2C(O)CH_2	Ethyleneoxide	Hamer	Zeeman studies
C_2D_4O	D_2C(O)CD_2			
$C_6H_4F_2$		Orthodifluorobenzene	Sutter	Zeeman studies
CH_3NO_2	CH_3NO_2	Nitromethane	Engelbrecht	Zeeman-studies Manuscript submitted

19. Name of Institution Kyushu University, JAPAN

Name of Department or Institute Department of Chemistry, Faculty of Science

Name to Whom Queries Should Be Addressed Eizi Hirota

Formula	Name of Compound	Name of Investigator	Present Stage of Progress
C_5H_8 $[CH_2=CHCH_2CH=CH_2]$	1,4-Pentadiene	T. Shigemune E. Hirota	One rotamer assigned.

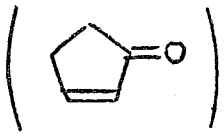
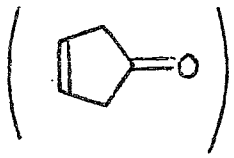
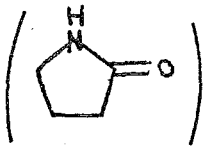
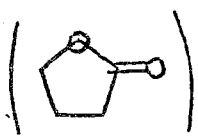
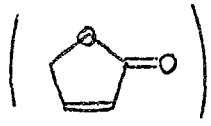
O_2	Oxygen	T. Amano	Manuscript in preparation.
CH_3F, CD_3F	Methyl fluoride	T. Tanaka	Work almost completed.
$F_2Si(SiF_2)$	Silicon difluoride	H. Shoji	In press (J. Mol. Spectrosc.).
AsF_3	Arsenic trifluoride	T. Chikaraishi	Manuscript in preparation.
$CH_3NS(CHSNH_2)$	Thioformamide	R. Sugisaki	Manuscript in preparation.
$CH_3NO(CHONH_2)$	Formamide	R. Sugisaki	Manuscript in preparation.
BrO	Bromine monoxide	A. Yoshinaga	In press (J. Mol. Spectrosc.).
$C_6H_{10}S$ 	7-Thiabicyclo-[2.2.1]heptane	K. Irie E. Hirota	Work in progress.
CH_3Cl, CD_3Cl	Methyl chloride	M. Hirashita	Work almost completed.
$ClHO_4(HOClO_3)$	Perchloric acid	K. Fujimoto	Assigned.
CH_2F_2, CD_2F_2	Methylene fluoride	M. Sahara E. Hirota	Work in progress.
FS	Sulfur monofluoride	T. Amano	In press (J. Mol. Spectrosc.).
ClO	Chlorine monoxide	T. Amano	Manuscript in preparation
C_3H_8O, C_3H_7DO [$(CH_3)_2CHOH$, $(CH_3)_2CHOD$]	Isopropanol	E. Hirota	Work in progress.
$C_3H_2D_2(H_2C=C=CD_2)$	Allene	E. Hirota	Manuscript in preparation.
$C_6H_{12}Si$ 	1-Silabicyclo-[2.2.1]heptane	K. Tanaka	Assigned.

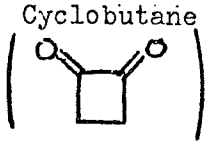
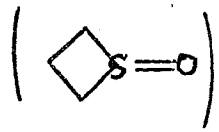
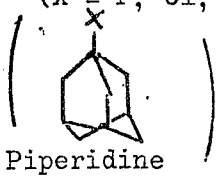
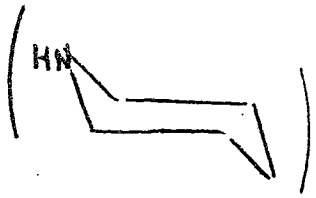
$F_2S(SF_2)$	Sulfur difluoride	T. Chikaraishi	Excited vibrational state; Work in progress.
$O_2S(SO_2)$	Sulfur dioxide	K. Nakashima	Dipole Moment in the excited vibrational state; Work in progress.
$F_4S(SF_4)$	Sulfur tetrafluoride	A. Naruse	Excited vibrational state; Work in progress.

20. UNIVERSITY COLLEGE LONDON

Department of Chemistry

D. J. Millen/A. C. Legon

C_5H_6O	Cyclopent-2-en-1-one 	D. Chadwick	Ring puckering potential under investigation
C_5H_6O	Cyclopent-3-en-1-one 	J. W. Bevan	Manuscripts on r_s-structure and ring bending potential function submitted
C_4H_7ON	Pyrrolidone 	J. W. Bevan	Normal species and N-D spectra assigned
$C_4H_6O_2$	γ-Butyrolactone 	J. W. Bevan	Preliminary publication. Further work in progress
$C_4H_4O_2$	γ-Crotonolactone 	A. C. Legon	Preliminary publication. Further work planned

$C_4H_4O_2$	Cyclobutane 1,2 dione 	A. C. Legon	Spectrum assigned
C_3H_6SO	Trimethylene sulphoxide 	J. W. Bevan	Spectrum assigned
$C_{10}H_{15}X$	1-halogenoadamantanes (X = F, Cl, Br) 	C. Bush	^{13}C species investigated
$C_5H_{11}N$	Piperidine 	J. E. Parkin	Manuscript in preparation

1. Name of Institution University of Manchester, Manchester M 13 9PL, U.K.

   Name of Department or Institute Schuster Laboratory

   Name to Whom Queries Should Be Addressed Dr. J. G. Baker

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
BrF_5	Bromine pentafluoride	(D. M. Brookbanks)	Ground states published; excited states search.
IF_5	Iodine pentafluoride	(S. R. Jones)	
SiH_3F	Silyl fluoride	S.R. Jones	isotopic species and excited states observed
$CHCl_3$	Chloroform	C. Georghiou	(quadrupole coupling in excited states)
$CHBr_3$	Bromoform	C. Georghiou	
$C_2H_3F_3$ (CH_3CF_3)	1,1,1, trifluoroethane	H. M. Jones	intensities of excited states

22. Name of Institution University of Maryland

Name of Department or Institute Institute for Molecular Physics

Name to Whom Queries Should Be Addressed Lawrence C. Krisher

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CH_5FGe (CH_2FGeH_3)	Fluoromethyl-germane	L. C. Krisher J. Morrison W. Watson	Q-branch assigned.
$C_2H_4O_2$ (CH_3COOH)	Acetic acid	L. C. Krisher	Low J, low frequency, for radio-astron.
$C_2H_5NO_2$	Glycine	L. C. Krisher	Abandoned, (hot-cell).

23. Department of Chemistry
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139
Stephen G. Kukolich, Room 2-039

Molecule		Investigators	Progress
CF_2H_2	Difluoromethane	Kukolich & Wang	High Resolution Spectrum, Hyperfine Structure Assigned.
$BrCH_3$ (CH_3Br)	Methyl Bromide	Oates & Williams	Some High Resolution Spectra Obtained.
H_3N (NH_3)	Ammonia	Wang & Levy	Double Resonance and Transient Response Data Obtained.

24. McDonnell Douglas Corporation

McDonnell Douglas Research Laboratories

James E. Wollrab

$C_2H_4F_2(CF_2HCH_3)$	1,1 difluoroethane	Several excited states above v=1(torsion) assigned.
$BrFO_2S(SO_2BrF)$	Sulfuryl bromide fluoride	completed
CS	Carbon monosulfide	lifetime measured by observing decay of J=0-1 rotational transition.
$C_3H_9N((CH_3)_3N)$	Trimethylamine	A_2 torsional frequency measured from relative intensity measurements (with E.A.Rinehart and P.R.Reinhart; U. of Wyoming).
$C_2BrF_3(CF_2=CFBr)$	Bromotrifluoroethylene	Br quadrupole splittings being analyzed(with John Rigden, Univ. of Missouri-St.Louis).

5. Name of Institution Memphis State University

Name of Department or Institute Chemistry Department

Name to Whom Queries Should Be Addressed Robert G. Ford

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_2H_2ClFO	Fluoroacetyl chloride	L. Szalanski	One rotamer assigned
C_2H_3ClO	Chloroacetaldehyde	R. Ford	Two rotamers assigned
$C_3H_5NO_2$	trans 1-nitropropene	R. Ford	spectrum assigned

6. Name of Institution: Michigan State University

Name of Department or Institute: Department of Chemistry

Name to Whom Queries should be Addressed: Richard H. Schwendeman

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STATE OF PROGRESS
C_5H_8 ($CH_2CH_2CHCHCH_2$)	Vinylcyclopropane	E. Codding	Manuscript in preparation
$C_3H_4O_2$ ($CH_2OCHCHO$)	Glycidaldehyde	P. Manor	Manuscript in preparation
C_4H_8O ($CH_3CH_2CH_2CHO$)	n-Butyraldehyde	P. Lee	Two rotamers Manuscript in preparation
CH_3F_2P (CH_3PF_2)	Methyldifluorophosphine	E. Codding	Manuscript in preparation
CH_3F_2OP (CH_3OPF_2)	Methoxydifluorophosphine	E. Codding C. Jones	Manuscript in preparation
CH_6BF_2P ($CH_3PF_2BH_3$)	Methyldifluorophosphine-BH_3	R. Elzaro	Normal and BD_3 species assigned
C_3H_7NO ($HCON(CH_3)_2$)	Dimethylformamide	A. Brittain R. Elzaro	Parent, d_7, and CD_3 (cis and trans) species assigned
C_2H_5NO ($HCONHCH_3$)	N-methylformamide	R. Elzaro	Species with CH_3 cis to O assigned
C_2H_4O (CH_2CH_2O)	Ethylene oxide	R. Creswell	^{17}O quadrupole

Name of Institution University of Michigan

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed Robert L. Kuczkowski

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$C_2H_4O_3$ (H_2COOCH_2O)	Ethylene ozonide	C. Gillies	Further studies

$C_2H_2F_2O_3$ ($F_2\overline{COOCH_2O}$)	1,1-difluoro-ethylene ozonide	C. Gillies	Spectrum assigned
$C_3H_6O_3$ ($CH_3\overline{CHOOCH_2O}$)	Propylene ozonide	R. Lattimer	Structure in progress
$C_4H_8O_3$($CH_3\overline{CHOOCH(CH_3)O}$)	Trans-2-butene ozonide	R. Lattimer	Spectrum assigned
C_5H_4($CH{\equiv}C-CH_2-C{\equiv}CH$)	1,4-pentadiyne	R. Lattimer	2 isotopes assigned
N_2O_3	Dinitrogen trioxide	R. Kuczkowski	Vibrational satellites
C_5H_5As	Arsabenzene	R. Kuczkowski	In progress
CD_3I	Methyl iodide	R. Kuczkowski	In press (J. Mol. Spec.)

Name of Institution : MONASH UNIVERSITY

Name of Department : CHEMISTRY DEPARTMENT

Name to Whom Queries Should Be Addressed: PROFESSOR R.D.BROWN, DR.F.R.BURDEN

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_5H_4O	cyclopentadienone	P. Baron	spectrum assigned paper in preparation
CN_4	cyanogen azide	K. Bolton	paper submitted
C_4H_5N	pyrrole	K. Bolton	N.Q.C. constants redetermined
$C_4H_4N_2$	pyrimidine	E. Clarke	work continuing

C_4H_4Te	tellurophene	J. Crofts	paper submitted
$C_2H_4O_2$	peroxirane	W. Garland	work continuing
$C_2H_3NO_5$	peroxyacetyl nitrate (PAN)	F. Gillan M. Haynes H. Johansen	spectrum recorded
NF_2	nitrogen(II) fluoride	I. Gillard	assignment complete paper in preparation
C_5H_4NCl	m-chloropyridine	J. Matouskova	spectrum assigned N.Q.C. analysis in progress
$C_2H_3N_3$	1, 2, 4-triazole	A. Mishra	paper in preparation
C_6H_6	dimethylenecyclobutene	A. Ottrey	work continuing
CH_2N_2	isocyanamide	I. Tait	work in progress.

29.

UNIVERSITY OF NANCY
Laboratoire de Chimie Théorique
Case Officielle n° 140 - 54037 NANCY Cedex (France)
J.BARRIOL - G.ROUSSY

$C_3H_3N(CH_2=CHCN)$	Acrylonitrile	J.Demaison	- Centrifugal distorsion analysis - Excited States.
$C_3H_7N(CH_2=CHCH_2NH_2)$	Allylamine	G.Roussy in collaboration with Freiburg	- Work continuing

C_4H_3N(CH_2=C=CHCN)	Cyanoallene	J.Demaison A.Bouchy	- Manuscript submitted
C_3H_3Cl (CH_2=C=CHCl)	Chloroallene	J.Demaison	- Work in progress.
C_5H_8((CH_3)$_2$C=C=CH_2)	Dimethylallene	J.Demaison in collaboration with Freiburg	- Isotopic species
C_4H_5NS(CH_2=CHCH_2NCS)	Allylisothiocyanate	A.Bouchy	- Work in progress
C_7H_5NS 	Phenylisothiocyanate	A.Bouchy	- Partial assignment
C_7H_5NO 	Phenylisocyanate	A.Bouchy	- Paper in preparation
C_6H_5Cl 	Chlorobenzene	H. Nery	- D and ^{13}C isotopic species.

Name of Institution National Bureau of Standards, Washington, D.C. 20234

Name of Department or Institute Molecular Spectroscopy Section

Name to Whom Queries Should Be Addressed Donald R. Johnson

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CH_3N (CH_2NH)	Methylenimine	Johnson, Lovas, & Kirchhoff	Chem. Phys. Let. 15, 65 (1972) Critical Rev. in press, J. Phys. Chem. Ref. Data Isotopic species in progress.
BF_2H_2N (BF_2NH_2)	Difluoroboramine	Lovas & Johnson	$^{15}N, D_2$ $^{10}B, ^{11}B$ Species measured Manuscript in preparation.
COS (OCS)	Carbonyl sulfide	Maki & Johnson	^{13}C, ^{18}O vib. states in press J. Mol. Spec.
		Maki	Critical Rev. in progress.
CF_2	Carbon difluoride	Kirchhoff, Lide & Powell	Cent. distortion analysis in press J. Mol. Spec.

F_2S (SF_2)	Sulfur difluoride	Kirchhoff, Johnson & Powell	Cent. distortion analysis in press J. Mol. Spec.
OS_2 (S_2O)	Disulfur monoxide	Tiemann, Hoeft, Lovas & Johnson	Isotopic species and excited vib. states in progress.
HNO_3	Nitric acid	Lovas & Johnson	In press Ap. J. Lett. Cent. distortion analysis in progress.
CH_4O (CH_3OH)	Methanol	Lees, Lovas, Kirchhoff & Johnson	Critical Rev. in press J. Phys. Chem. Ref. Data.
CHN (HCN)	Hydrogen cyanide	Maki	Critical rev. in progress.
CO CS OSi (SiO)	Carbon monoxide Carbon monosulfide Silicon monoxide	Krupenie & Lovas	Critical rev. in progress.
Diatomic molecules		Lovas	Microwave spectral tables compilation in progress.
$C_4H_6O_2$	3,6-dioxabicyclo[3.1.0.] hexane	Lafferty	In press, J. Mol. Spec.
$C_5H_{10}S$	Pentamethylene sulfide	Lafferty	Conformation established, manuscript in prep.
C_4H_8OS	1,4-thioxane	Lafferty	Manuscript in prep.

31. NATIONAL CHEMICAL LABORATORY FOR INDUSTRY
2nd Division
Honmachi-1, Shibuya-ku, Tokyo
Chi Matsumura

C_3H_4 ($H_2C=C=CD_2$)	Allene 1,1-d_2	C.Matsumura	Manuscript in preparation
CH_3BF_2O (BF_2OCH_3)	Methoxy difluoroborane	H.Takeo	Work in progress

32. National Research Council of Canada

Division of Physics

T. Oka

FORMULA	NAME	INVESTIGATOR	PRESENT STAGE OF PROGRESS
NH_3	Ammonia	S.M. Freund	Mw-Ir two photon spectroscopy.
		F. Chu	Millimeter wave spectroscopy in the excited state.
CH_4	Methane	R.F. Curl	Mw-Ir double resonance.
CH_3F	Methyl fluoride	S.M. Freund	rf-Ir two photon spectroscopy.
		F. Chu	Millimeter wave - Ir double resonance.
CH_3CN	Methyl cyanide	M. Römheld and S.M. Freund	rf-Ir two photon spectroscopy.
NO_2	Nitrogen oxide	K. Abe and R.F. Curl	Optical - Mw double resonance.
H_2CO	Formaldehyde	F. Chu	Millimeter wave-Mw double resonance.

Name of Institution University of New Brunswick

Name of Department or Institute Physics and Chemistry

Name to Whom Queries Should Be Addressed K. V. L. N. Sastry or R. M. Lees

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_6F_5SH	Penta-Fluoro thio Phenol	H. Pavaday	Spectrum observed
C_6F_5OH	Penta-Fluoro Phenol	M. Eshaque	"
C_2F_3D	Deutero-trifluoro-ethylene	"	"

$C_3H_6O_2$ (CH_2-O-CH-CH_2OH)	Glycidol	K. V. L. N. Sastry W. V. F. Brooks	Manuscript under preparation
CH_4O (CH_3OH)	Methyl alcohol	S. S. Haque R. M. Lees	Double resonance. C-13 spectrum assigned

34. Name of Institution: University of Newcastle upon Tyne, U.K.

Name of Department: Physical Chemistry Department

Name to Whom Queries should be addressed: Professor D.H. Whiffen

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
COF_2	Carbonyl Fluoride	J.H. Carpenter	Manuscript in Preparation
$COBr_2$	Carbonyl Bromide	I. Thompson	Spectrum being Recorded
$CSCl_2$	Thiocarbonyl Chloride	D.F. Rimmer	Assignment of two isotopes complete. Centrifugal distortion treatment under way
$CSBr_2$	Thiocarbonyl Bromide	I. Thompson	Search for Spectrum
CF_3NO	Trifluoronitrosomethane	J.G. Smith	Work abandoned
F_2SO	Thionyl Fluoride	J.G. Smith	Work completed. Manuscript accepted
F_3PO	Phosphoryl Fluoride	J.G. Smith	Excited vibrational states assigned

35. Name of Institution: UNIVERSITY OF OSLO

Name of Department or Institute: DEPARTMENT OF CHEMISTRY

Name to Whom Queries Should be Addressed: K.-M. MARSTOKK / H. MØLLENDAL

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STATE OF PROGRESS
C_3BrN(BrCCCN)	Bromocyanoacetylene	T. Bjorvatten	Paper submitted
C_3ClN(ClCCCN)	Chlorocyanoacetylene	T. Bjorvatten	
C_3IN(ICCCN)	Iodocyanoacetylene	T. Bjorvatten	
C_3H_5NO(CH_3CH_2NCO)	Ethylisocyanate	A. Bjørseth	Abandoned
$C_2H_2O_3$(CHOCOOH)	Glyoxylic acid	I. Christiansen	Three ^{18}O species assigned
$C_2H_6O_2$($HOCH_2CH_2OH$)	Ethylene glycol	H. Møllendal	Temporarily abandoned
$C_2H_4O_2$(CH_2OHCHO)	Glycolaldehyde	H. Møllendal	Structure in press
$C_3H_6O_3$(CH_3OCH_2COOH)	Methoxyacetic acid	H. Møllendal	Paper submitted
$C_3H_4O_3$($CH_3COCOOH$)	Pyruvic acid	H. Møllendal	Assigned
C_3H_5NS(CH_3CH_2NCS)	Ethylisothiocyanate	K. Solgaard	Abandoned
C_3H_5NO(CH_3OCH_2CN)	Methoxyacetonitrile	K. Solgaard	Assigned

36. Name of Institution: THE PENNSYLVANIA STATE UNIVERSITY

Name of Department or Institute: Department of Chemistry

Name to Whom Queries Should Be Addressed: Prof. L. Peter Gold

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CHOCl (HCOCl)	Formyl chloride		partially assigned

37. Name of Institution Princeton University

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed Victor W. Laurie

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_3H_4F_2$ $(CH_2CH_2CF_2)$	1,1-difluoro cyclopropane	A. Peretta	five isotopic species assigned
C_4H_5N (CH_2CH_2CHCN)	cyclopropyl cyanide	R. Pearson	c-type transitions for parent species assigned. a-type for ^{13}C species
$C_5H_4N_2$ $[CH_2CH_2C(CN)_2]$	1,1-dicyano cyclopropane	R. Pearson	partial assignment
C_2H_7N $(CH_3CH_2NH_2)$	ethylamine	Y. S. Li	manuscript in preparation
$C_3H_2F_4$ $(CH_2CF_2CF_2)$	tetrafluoro cyclopropane	W. Stigliani	in progress

38. Name of Institution Queen's University, Kingston, Ontario

Name of Department or Institute Chemistry

Name to Whom Queries Should Be Addressed R. Kewley

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_6H_{13}N$	N-methyl piperidine	S. C. Dass	Q-branch series assigned.

$C_5H_{11}NO$	N-methyl morpholine	S. C. Dass	R-branch lines assigned and rotational constant determined. s
C_3H_5NO	Methoxyacetonitrile	R. Kewley	Spectra of trans and gauche isomers assigned.
$C_6H_{10}S$	Cyclohexene sulfide	R. Kewley	In press.
/OH	Hydroxyl radical	D.B. McLay	Stark effect in $^2\Pi_{3/2}$ state J = 3/2, 5/2

39. Name of Institution: University of Reading, Berkshire, England.

Name of Department or Institute: Department of Chemistry

Name to Whom Queries Should be Addressed: Ian M Mills

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_3H_6O	Oxetane-n,-d_6, -βd_2,-αd_4	R A Creswell	Excited vibrational states: work complete, paper in preparation.
	Oxetane-αd_2	P D Mallinson A G Robiette	Similar work nearly complete.
CD_3I	Methyl iodide	R L Kuczkowski	Excited vibrational states: work complete, paper in press.
C_7H_6O	Tropone	R A Creswell	Assigned; note in preparation.
F_3HSi	Trifluorosilane -h, and -d	A R Hoy and M Bertram	Excited vibrational states: work complete, paper in press.
$C_6H_{10}O$	7-oxabicyclo[2.2.1.] heptane	R A Creswell	Assigned; note in preparation.
C_3H_4	Propyne, CH_3CCH CH_3CCD and CD_3CCH	M Bertram	Excited vibrational states.

	CHD_2CCH	P D Mallinson	Excited vibrational states.
C&CN	Cyanogen chloride	D A Haner	Excited vibrational states.

40. Name of Institution Rice University

Name of Department or Institute Chemistry Department

Name to Whom Queries Should Be Addressed R. F. Curl

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CH_6OSi	Silyl methyl ether	C. Le Croix	normal, and all d_3 species assigned dipole moment
C_2ClH_5O	Chloromethyl ether	T. Ikeda	gauche rotamer assigned
C_3H_9NO	3-amino propanol	M. Norris	H bonded rotamer assigned

41. Sagami Chemical Research Center

Sagamihara, Kanagawa 229, Japan

Yonezo Morino

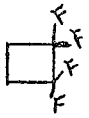
ICO)CO	Formyl radical	S. Saito	1_{01} - 0_{00} transition (Astrophys. J. 178, L53). Dipole moment determined.
IO	IO radical	S. Saito	Manuscript in preparation.
INO	Nitroxyl	S. Saito	In press (J. Mol. Spectry.).

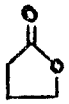
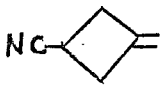
C_3H_7F (CH_3CHFCH_3)	2-fluoropropane	S. Saito N. Yoshida F. Makino	Excited vibrational states.
$C_3H_3F_3$ (CF_3CHCH_2)	3,3,3-trifluoropropene	S. Saito F. Makino	Manuscript in preparation.

Name of Institution University of South Carolina

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should be Addressed J. R. Durig

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$C_7H_{10}O$ 	Bicyclo[2.2.1]hepta-7-one	Lopata	partially assigned
C_7H_8O 	Bicyclo[2.2.1]hepta-2-ene-7-one	Li	" "
$C_4H_6F_2Si$ 	1,1-Difluorosilylcyclopenta-3-ene	Carreira	spectrum assigned
P_2D_4 (D_2PPD_2)	Tetradeuteriobiphosphine	Carreira	in progress
C_4H_6Si 	Silylcyclopenta-2-ene	Bucy	in progress
$C_4H_4F_4$ 	1,1,2,2-Tetrafluorocyclobutane	Hudgens	partially assigned
$C_2H_{10}BP$ ($(CH_3)_2PHBH_3$)	Dimethylphosphineborane	Hudgens	in progress
$C_2H_{10}BN$ ($(CH_3)_2NHBH_3$)	Dimethylamineborane	Hudgens	" "
$C_3H_{12}AsB$ ($(CH_3)_3AsBH_3$)	Trimethylarsineborane	Hudgens	Five species assigned

$C_3H_6O_2$ 	γ-Butyrolactone	Tong	Manuscript in preparation
$C_3H_2F_2$ (FHCCCHF)	1,3-Difluoroallene	Tong	in progress
$C_3H_2F_2$ (CH_2CCF_2)	1,1-Difluoroallene	Tong and Li	Complete structure done. More excited state work in progress
C_3H_3F (CH_2CCHF)	Monofluoroallene	Tong	spectrum assigned
C_6H_7N 	3-Methylenecyclobutanecarbonitrile	Li with Harmony	spectrum assigned
C_4H_6BF	Divinylfluoroborane	Cox	in progress
CHBrClF (HCFClBr)	Bromochlorofluoromethane	Griffin	in progress
$C_2H_3BF_2$	Vinyldifluoroborane	Carter	Manuscript in preparation
$C_4H_{12}N_2$ $(CH_3)_2NN(CH_3)_2$	Tetramethylhydrazine	Carreira	in progress
C_6H_5COCl	Benzoyl chloride	Carter	in progress
CH_5D_3BP ($CH_3PH_2BD_3$)	Methylphosphineborane	Kalasinsky	Internal rotation problem in progress

13. Name of Institution University of Southern California

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed Prof. Robert A. Beaudet

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_2B_3H_4 \cdot CH_3$	Methyl-dicarbapentaborane(5)	Beaudet Lau	Manuscript in preparation
CB_5H_7	Monocarbahexaborane(7)	Beaudet McKown, Lau	Isotopes under assigned
$C_4B_2H_6$	Tetracarbahexaborane(6)	Beaudet Pasinski	Manuscript in Preparation
SiH_3SiF_3	1,1,1-trifluoro silane	Beaudet Pasinski	Manuscript in Preparation
$NH_2B_2H_5$	Amino diborane	Beaudet Cohen Lau	Spectra not yet assigned
$SiH_3 \cdot C_2B_5H_7$	μ-Silyl dicarbaheptaborane(7)	Beaudet Lau	Spectra partially assigned
OD	Hydroxyl radical	Beaudet Poynter	Manuscript in preparation.
$CH_2(CH_2)_4 \cdot CH - CH$ (O)	Cycloheptene oxide	Beaudet Servis	Spectrum not yet assigned.
$C_3B_5H_7$	Tricarbaoctaborane	Beaudet Lau	Spectra not yet assigned.

44. UNIVERSITY OF SUSSEX

SCHOOL OF MOLECULAR SCIENCES

BRIGHTON, U.K.

H.W. KROTO

CH_3NSi	SiH_3CN	Silyl Cyanide	A.J. Careless	Vib.-rot analysis compl. ms. in prep.
CH_3GeN	GeH_3CN	Germyl Cyanide	A.J. Careless	Partial vib.-rot analysis
C_4H_9NOSi	$(CH_3)_3SiNCO$	Trimethyl Silyl isocyanate	A.J. Careless M. Green	Published

C_4H_9NSSi	$(CH_3)_3SiNCS$	Trimethyl Silyl isothiocyanate	A.J. Careless A.P. Cox	Analysis nearing completion
CF_2S	F_2CS	Thiocarbonyl fluoride	A.J. Careless B. Landsberg	In press (struct.+dipole)
C_2H_4S	CH_3CHS	Thioacetaldehyde	B. Landsberg	Spectrum assigned barrier and r_s structure in prog.
$C_5H_{10}Si$	$(CH_3)_3SiCCH$	Trimethyl Silyl acetylene	-	Spectrum assigned

45. SWISS FEDERAL INSTITUTE OF TECHNOLOGY
Laboratory for Physical Chemistry
Zurich , Switzerland
Hs. H. Günthard / A. Bauder

$C_2H_5NO_2$	Nitroethane	J. Ekkers	Partially assigned
$C_3H_4O_3$ $(CH_3COCOOH)$	Pyruvic acid	Ch. Kaluza	Partially assigned
C_3H_7N $(CH_3CH=NCH_3)$	N-Methylethyliden-imine	W. Bossert	Deuterated species

Name of Institution TATA INSTITUTE OF FUNDAMENTAL RESEARCH, BOMBAY (INDIA)

Name of Department or Institute CHEMICAL PHYSICS GROUP

Name to Whom Queries Should Be Addressed S. DORAISWAMY OR S.D. SHARMA

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_6F_5H	PENTAFLUOROBENZENE	S. DORAISWAMY S.D. SHARMA	DIPOLE MOMENT MEASURED. AND CENTRIFUGAL DISTORTION CONSTANTS EVALUATED.

C_5F_5N	PENTAFLUOROPYRIDINE	S.D. SHARMA S. DORAISWAMY	SPECTRUM ASSIGNED
C_7F_5N	PENTAFLUOROBENZONITRILE	S. DORAISWAMY S.D. SHARMA	DIPOLE MOMENT MEASUREMENT IN PROGRESS
C_5H_4NCl	2- CHLOROPYRIDINE	S.D. SHARMA S. DORAISWAMY	NITROGEN QUADRUPOLE ANALYSIS IN PROGRESS

7. Name of Institution University of Texas at Austin

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed James E. Boggs

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_3H_9N $(CH_3CH_2NHCH_3)$	Methylaminoethane	R.E. Penn	Manuscript submitted
C_5H_8 $((CH_3)_2CHC{\equiv}CH)$	3-Methyl-1-butyne	A.R. Mochel, A. Bjørseth, and C.O. Britt	Manuscript submitted
C_4H_8O $(CH_2\text{-}CH_2\text{-}CH\text{-}OCH_3)$	Cyclopropyl methy ether	R.E. Penn	Manuscript submitted
C_3H_9N $((CH_3)_2CHNH_2)$	Isopropylamine	L. Griffin and C.O. Britt	Manuscript in preparation
C_3H_8S $((CH_3)_2CHSH)$	Isopropyl mercaptan	J. Griffiths	Manuscript in preparation
C_4H_5N $(CH_2\text{-}CH_2\text{-}CH\text{-}CN)$	Cyclopropyl cyanide	R.E. Penn	Isotopic species assigned
C_4H_6O $(CH_3CH_2OC{\equiv}CH)$	Ethyl ethynyl ether	A. Bjørseth	Two rotamers assigned

Name of Institution Tokyo Institute of Technology

Name of Department or Institute Lab. of Molecular Spectroscopy

Name to Whom Queries Should Be Addressed Prof. Shiro Maeda

CH_3I	Methyliodide	Y. Kawashima	vib-rot manuscript prepared
$C_3H_5NO_2$ ($CH_3CH_2CH(NO_2)$)	trans-1-Nitropropene	K. Tochigi	manuscript in preparation
C_6H_5NO	2-Pyridine aldehyde	Y. Kawashima	manuscript in preparation
C_2H_4O (CH_2-CH_2 with O)	Ethylene oxide	C. Hirose	10 isotopes r_0, r_s, r_m manuscript
C_2H_4O (CH_2-CH_2 with O)	Ethylene oxide	N. Yoshimizu	vib-rot 4 states obsd.
C_4H_6O ($(CH_2CH)_2O$)	Divinyl ether	C. Hirose	vib-rot in progress
C_6H_7N ($C_6H_5NH_2$)	Aniline	A. Hatta	manuscript accepted Bull. Chem. Soc. Japan

Name of Institution Toyama University

Name of Department or Institute Department of Physics

Name to Whom Queries Should Be Addressed Takeshi Kojima

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$CH_5N(CH_3NHD)$	Methylamine	K. Takagi T. Kojima	Manuscript in Preparation
HO(OH)	OH radical	S. Tsunekawa	MMW spectrum

Name of Institution Universitaet Tuebingen

Name of Department or Institute Institut fuer Physikalische Chemie

Name to Whom Queries Should Be Addressed Professor Dr. W. Z e i l

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CFCl	Sulfonylchloridfluoride	H.Kohrmann, W.Zeil	work completed r_o, r_z, r'_z and r_e structure determined.
$H_3CH_2SiH_2Cl$	Ethyl chloro silane	V.Typke, W.Zeil	work completed r_o structure of trans- and gauche-form determined
$H_2Cl-C\equiv C-Cl$	1,3-Dichloropropyne	H.Günther, W.Zeil	partial r_s structure determined. Centrifugal distortion constants determined eQq for both the Cl-positions determined
$CH_3)_3SiCl$	Trimethylchlorosilane	B.Haas, W.Zeil	eQq re-determined
$CD_3)_2SiHCl$	6D-Dimethylchlorosilane	B. Haas, W.Zeil	work in progress
$CD_3)_2CH_3CCl$	6D-Tertiarybutylchloride	H. Umbrecht, W.Zeil	work in progress

Name of Institution *Virginia Polytechnic Institute and State University*

Name of Department or Institute *Department of Chemistry*

Name to Whom Queries Should Be Addressed *Jack D. Graybeal*

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_2H_2BrN(CH_2BrCN)$	*Monobromoacetonitrile*	*M. Gum*	*Manuscript in preparation. Work in progress on aeutrated species.*
CrF_2O_2	*Chromyl fluoride*	*C. Shoemaker*	*Work in progress*

2. Name of Institution University of Wisconsin - Madison

Name of Department or Institute Chemistry

Name to Whom Queries Should Be Addressed R. Claude Woods

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_2H_4O_2$ (CH_2OHCHO)	Glycolaldehyde	T. A. Dixon	In progress
$C_4H_{10}O$ ($(CH_3)_3COH$)	t-butyl alcohol	E. Valenzuela	In progress
$C_4H_{10}S$ ($(CH_3)_3CSH$)	t-butyl mercaptan	E. Valenzuela	In progress

53. Bashkirian Filial of Academy of Sciences of the USSR.
Institute of Chemistry,
Ufa-450025,USSR.
N.M.Pozdeev

C_4H_8S	tetrahydrothiophen	pseudorotational and radial excited states, in press.
$C_3^{12}DH_3N_2^{15}$(4-D)	pyrazole	r_o-structure,
$C_3^{12}DH_2N^{14}N^{15}$(4-D,1(2)-N^{15})	pyrazole	in press.
$C_7H_{11}N$	2,6-dimethylpyridin	work in progress.
C_5H_6S	2-methylthiophen	manuscript in prep.

FORMULA INDEX

I_4 - Methane - 32

I_4ClN - N-chloromethylamine - 3

I_4O (CH_3OH) - Methanol - 30, 25, 33

I_5FGe (CH_2FGeH_3) - Fluoromethyl-germane - 22

I_5N(CH_3NHD) - Methyl amine - 49

I_5NO (CH_3ONH_2) - Methoxyamine - 17

I_6BF_2P ($CH_3PF_2BH_3$) - Methyldifluorophosphine - BH_3 - 26

I_6BP - Methylphosphineborane - 42

I_6OSi (CH_3OSiH_3) - Silyl methyl ether - 40

I_7B_5 - Monocarbahexaborane (7) - 43

I_8BP - ($CH_3PH_2BD_3$) - Methylphosphineborane - 42

BrF_3 - Trifluoro bromo ethylene - 1, 24

HF_3 - Deutero-trifluoro-ethylene - 33

HF_3O_2 (CF_3COOH) - Trifluoro acetic acid - 1

H_2BrN(CH_2BrCN) - Monobromacetonitrile - 51

H_2ClFO - Fluoroacetyl chloride - 25

$H_2F_2O_3$ ($F_2\underline{COOCH_2O}$) - 1,1-difluoroethylene ozonide - 27

H_2N_2O - 2,4-oxadiazole - 2

H_2N_2S - 2,4-thiadiazole - 2

D_2O (D_2CCO) - Dideuteroketene - 18

H_2O_3(CHO-COOH) - Glyoxylic acid - 35

H_3BF_2 - Vinyldifluoroborane - 42

H_3ClO - Chloroacetaldehyde - 25

H_3ClO_2(Cl $COOCH_3$) - Methyl chloroformate - 2

H_3Cl_2F - 1,1,1 dichlorodifluoroethane - 8

H_3F_3(CH_3CF_3) - 1,1,1, trifluoroethane - 21

H_3N (CH_3CN) - Methyl cyanide - 32

C_2H_3NO (CH_3CNO) - Methylfulmide - 18

$C_2H_3NO_2$($HN(CHO)_2$) - Formimide - 14

$C_2H_3NO_5$ - Peroxyacetyl nitrate (PAN) - 28

C_2H_3NS - d_3 - methylthiocyanate - 11, 18

$C_2H_3N_3$ - 1,2,4-triazole - 28

C_2H_4ClF - 1,1-chlorofluoroethane - 8

$C_2H_4F_2$(CF_2HCH_3) - 1,1 difluoroethane - 24

C_2H_4O - Ethylene oxide - 18, 48, 26

C_2H_4OS ($HCOSCH_3$) - methyl thiolformate - 2

$C_2H_4O_2$ - Peroxirane - 28

$C_2H_4O_2$ (CH_2OHCHO) - Glycolaldehyde - 35, 52

$C_2H_4O_2$ (CH_3COOH) - Acetic acid - 22

$C_2H_4O_3$ ($CH_2OHCOOH$) - Glycolic Acid - 15

$C_2H_4O_3$($H_2\underline{COOCH_2O}$) - Ethylene ozonide - 27

C_2H_4S (CH_3CHS) - Thioacetaldehyde - 44

C_2H_5ClO - Chloromethyl ether - 40

C_2H_5NO (CH_3CONH_2) - Acetamide - 14

C_2H_5NO ($HCONHCH_3$) - N-methylformamide - 26, 14

$C_2H_5NO_2$ - Glycine - 22

$C_2H_5NO_2$ - Nitroethane - 45

$C_2H_5NO_3$ - Ethyl nitrate - 14

$C_2H_6N_2O$ - Dimethylnitrosamine - 3, 18

$C_2H_6N_2O_2$($(CH_3)_2NNO_2$)- Dimethylnitramine - 18

$C_2H_6O_2$ ($HOCH_2$-CH_2OH) - Ethyleneglycol - 35

C_2H_6S (CH_3-S-CH_3)- d_6-Dimethylsulfide - 11

$C_2H_6S_2$ (CH_3SSCD_3) - Dimethyldisulfide - 18

C_2H_6Se $(CH_3)_2Se$ - Dimethylselenide - 18

C_2H_6Te ($(CH_3)_2Te$) - Dimethyl telluride - 8

$_2H_7ClSi$ - Ethyl chlorosilane - 50

$_2H_7ClSi$ $(CD_3)_2SiHCl$ - 6D-Dimethyl-chlorosilane - 50

$_2H_7N$ $(CH_3CH_2NH_2)$ - Ethylamine - 37

$_2H_{10}BN$ $[(CH_3)_2HPBH_3]$ - Dimethyl amine borane - 42

$_2H_{10}BP$ $[(CH_3)_2HPBH_3]$ - Dimethyl phosphine borane - 42

$_2H_{10}B_5Si$ - μ-Silyl dicarbaheptaborane(7) 43

$_3BrN$ (BrCCCN) - Bromocyanoacetylene - 35

$_3ClN$(ClCCCN) - Chlorocyanoacetylene - 35

$_3F_4$ (CF_3CCF) - Perfluoropropyne - 2

$_3IN$ (ICCCN) - Iodocyanoacetylene - 35

$_3H_2Cl_2$ $(CH_2Cl\text{-}C{\equiv}C\text{-}Cl)$ - 1,3-Dichloropropyne- 50

$_3H_2F_2$ (CH_2CCF_2) - 1,1-Difluoroallene - 42

$_3H_2F_2$ (FHCCCHF) - 1,3-Difluoroallene - 42

$_3H_2F_4$ $(CH_2CF_2CF_2)$ - Tetrafluoro cyclo-propane - 37

$_3H_3Cl$ $(CH_2{=}C{=}CHCl)$ - Chloroallene - 29

$_3H_3F$ (CH_2CCHF) - Monofluoroallene - 42

$_3H_3F_3$ (CF_3CHCH_2) - 3,3,3-trifluoro-propene - 41

$_3H_3F_3O_2$ (CF_3COOCH_3) - Methyl trifluoroacetale - 2

$_3H_3N$ $(CH_2{=}CHCN)$ - Acrylonitrile - 29

$_3H_3NO$ - Isoxazole - 2

$_3H_4$ - Propyne, propyne -d_1 - 39

$_3H_4$ $(C_3D_2H_2)$ - Allene 1,1-d_2 - 19, 31

$_3H_4ClN$ $(ClCH_2CH_2CN)$ - 3-chloropropio-nitrile - 14

$_3H_4F_2$ $(CH_2CH_2CF_2)$ - 1,1-difluoro cyclo-propane - 37

$C_3H_4F_2$ - 2,3 difluoropropene - 7

$C_3H_4N_2$ - Pyrazole - 10, 53

$C_3H_4N_2$ - Imidazole - 2

C_3H_4O (CH_2CHCHO) - Acrolein - 19

$C_3H_4O_2$ - Malonaldehyde - 14

$C_3H_4O_2$ - Acrylic acid - 2

$C_3H_4O_2$ $(CH_2OCHCHO)$ - Glycidaldehyde - 26

$C_3H_4O_3$ $(CH_3COCOOH)$ - Pyruvic acid - 35, 45

C_3H_4S - Propargyl mercaptan - 2, 3

C_3H_5FO - Propionyl fluoride - 2

C_3H_5N (CH_3CD_2CN) - Propionitrile - 18

C_3H_5NO (CH_3OCH_2CN) - Methoxyaceto-nitrile - 35, 17, 38

C_3H_5NO (CH_3CH_2NCO) - Ethylisocyanate - 35

$C_3H_5NO_2$ $(CH_3CH_2CH(NO_2))$ - trans-1-Nitropropene - 48 25

C_3H_5NS $(CH_3\text{-}CH_2NCS)$ - Ethylisothio-cyanate - 35

C_3H_6O - Cyclopropanol - 2

C_3H_6O - Oxetane-n, d_6, β-d_2, α-d_4, α-d_2 species. - 39

C_3H_6OS - Trimethylene sulfoxide - 20

$C_3H_6O_2$ - Propionic acid - 2

$C_3H_6O_2$ - Glycidol - 33

$C_3H_6O_2$ - γ-Butyrolactone - 42

$C_3H_6O_3$ (CH_3OCH_2COOH) - Methoxyacetic acid - 35

$C_3H_6O_3$ - Propylene ozonide - 27

$C_3H_6O_3P$ - Trimethyl phosphorous acid - 7

H_7B_3 - Methyl-dicarbapentaborane (5) - 43

H_7B_5 - Tricarbaoctaborane - 43

H_7ClO - 3-chloropropanol - 14

H_7F (CH_3CHFCH_3) - 2-fluoropropane - 41

H_7FO ($FCH_2CH_2CH_2OH$) - 3-fluoropropanol - 14

H_7N - N-Methylethylidenimine - 45

H_7N ($CH_2=CHCH_2NH_2$) - Allylamine - 11, 29

H_7NO - Dimethylformamide - 26

H_8O [$(CH_3)_2CHOH$] - Isopropanol - 19

H_8S - Isopropyl mercaptan - 2, 47

H_9ClSi - Trimethylchlorosilane - 50

$H_9N((CH_3)_3N)$ - Trimethylamine - 24

$H_9N(CH_3CH_2NHCH_3)$ - Methylaminoethane - 47

$H_9N((CH_3)_2CHNH_2)$ - Isopropyl amine - 47

H_9NO - 3-amino propanol - 40

$H_{12}AsB$ - Trimethyl Arsine borane - 42

$H_{12}BN$ [$(CH_3)_3NBH_3$) - Trimethylamine borane - 42

H_2N_2 (NC-CH=CH-CN) - Maleonitrile - 10

H_3N ($CH_2=C=CHCN$) - Cyanoallene - 29

H_4F_4 - 1,1,2,2-Tetrafluorocyclobutane - 42

H_4N_2 - Pyrimidine - 28

H_4O - Methylcyclopropenone - 16

H_4O_2 - Cyclobutane 1,2 dione - 16, 20

H_4O_2 ($HCOOCH_2CCH$) - Propargyl formate - 2

H_4O_2 - ($O-CH_2-CH=CH-CO$) - γ-Crotonolactone - 20

H_4Te - Tellurophene - 28

C_4H_5N - Pyrrole - 28

C_4H_5N (CH_2CH_2CHCN) - Cyclopropyl cyanide - 37, 47

C_4H_5NO - 5 Methyl isoxazole - 2

C_4H_5NS - 3-methyl-iso-thiazole - 2

C_4H_5NS($CH_2=CHCH_2NCS$) - Allylisothio-cyanate - 29

C_4H_6BF - Divinylfluoroborane - 42

$C_4H_6B_2$ - Tetracarbahexaborane (6) - 43

$C_4H_6F_2Si$ - 1,1-Difluorosilylcyclopenta-3-ene - 42

$C_4H_6N_2$ - N-methyl imidazole - 2

$C_4H_6N_2$ - 3 Methyl pyrazole
5 methyl pyrazole - 2

C_4H_6O - Oxaspiropentane - 7

C_4H_6O ($(CH_2CH)_2O$) - Divinyl ether - 48

C_4H_6O ($(CH_3)_2CCO$) - Dimethylketene - 11

C_4H_6O ($CH_3CH_2OC\equiv CH$) - Ethyl ethynyl ether - 47

$C_4H_6O_2$ - γ-Butyrolactone - 20

$C_4H_6O_2$ - 3,6-dioxabicyclohexane [3.1.0.] - 30

$C_4H_6O_2$ - Cyclopropyl carboxylic acid - 2

C_4H_6Si - Silylcyclopenta-2-ene - 42

C_4H_7Cl - Iso-butenyl chloride - 14

C_4H_7FO - Isobutyryl fluoride - 2

C_4H_7N ($CH_3CH_2CH_2NC$) - n-Propyl Isocyanide - 14

C_4H_7NO - Acetone cyanohydrin - 2

C_4H_7NO ($CH_2-(CH_2)_3-NH-CO$) - Pyrrolidone - 20

H_7O_3P - 1-phospha 2,6,7 trioxa-bicyclo [2.2.2] octane - 7

H_8O - Cyclobutanol - 2

H_8O - Isobutyraldehyde - 2

$H_8O(CH_2\text{-}CH_2\text{-}CH\text{-}O\text{-}CH_3)$ - Cyclopropyl methyl ether - 47

H_8O ($CH_3CH_2CH_2CHO$) - n-Butyraldehyde - 26

H_8OS - Thioxane - 30

H_8O_2 - Isobutyric acid - 2

H_8O_3 ($CH_3CHOOCH(CH_3)O$) - Trans-2-butene ozonide - 27

H_8S - Tetrahydrothiophen - 53

H_9Cl - 6D-Tertiarybutylchloride - 50

$H_9NOSi[(CH_3)_3SiNCO]$ - Trimethyl silyl isocyanate - 44

H_9NSSi ($(CH_3)_3SiNCS$) - Trimethyl silyl isothiocyanate - 44

$H_{10}O$ ($(CH_3)_3COH$) - t-butyl alcohol - 52

$H_{10}S$ ($(CH_3)_3CSH$) - tert. butylmercaptan - 10, 52

$H_{12}N_2$ $(CH_3)_2NN(CH_3)_2$ - Tetramethylhydrazine - 42

F_5N - Pentafluoropyridine - 46

I_4 ($CH\equiv C\text{-}CH_2\text{-}C\equiv CH$) - 1,4-pentadiyne - 27

I_4ClN - 2-Chloropyridine - 28, 46

I_4N_2 $[CH_2CH_2C(CN)_2]$ - 1,1-dicyano cyclopropane - 37

I_4O - Cyclopentadienone - 28

I_5As - Arsabenzene - 27

I_5In - Cyclopentadienyl indium - 4

I_5N - Pyridine - 10

C_5H_5NNiO (C_5H_5NiNO) - Cyclopentadienyl nickel nitrosyl - 4

C_5H_5NO - Pyridine N-oxide - 10

C_5H_5Tl - Cyclopentadienyl thallium - 4

$C_5H_6N_2$ - 3 amino pyridine
4 amino pyridine - 2

C_5H_6O - $(CH_2\text{-}CH_2\text{-}CH{=}CH\text{-}CO)$ - Cyclopent-2-en-1-one - 20

C_5H_6O - $(CH_2\text{-}CH_2{=}CH\text{-}CH_2\text{-}CO)$ - Cyclopent-3-en-1-one - 20

C_5H_6S - 2-methyl thiophene - 53

C_5H_7N (C_4H_7CN) - Cyanocyclobutane - 17

C_5H_8 ($(CH_3)_2C{=}C{=}CH_2$) - Dimethylallene - 29, 11

C_5H_8 ($(CH_3)_2CHC{\equiv}CH$) - 3-methyl-1-butyne - 47

C_5H_8 [$CH_2{=}CHCH_2CH{=}CH$] - 1,4-Pentadiene - 19

C_5H_8 ($CH_2CH_2CHCHCH_2$) - Vinylcyclopropane - 26

$C_5H_8O_3$ - 2,6,7 trioxabicyclo [2.2.2] octane - 7

$C_5H_{10}S$ - Pentamethylene sulfide - 30

$C_5H_{10}Si$ - Trimethyl silyl acetylene - 44

$C_5H_{11}N$ - Piperidine - 20

$C_5H_{11}NO$ - N-methyl morpholine - 38

C_6HF_5 - Pentafluorobenzene - 46

C_6HF_5O - Penta-fluoro phenol - 33

C_6HF_5S - Penta-fluoro thio phenol - 33

$C_6H_2F_4$ - 1,2,3,4 Tetrafluorbenzene - 5

$m\text{-}C_6H_4FBr$ - m-fluoro bromo benzene - 1

$C_6H_4F_2$ - Orthodifluorobenzene - 18

$C_6H_5BF_2$ - Phenyl boron difluoride - 2

C_6H_5BrO - 4-bromo-phenol - 10

I_5Cl - Chlorobenzene - 29

I_5ClO - 4-Cl-phenol - 10

I_5FO - 4-F-phenol - 10

I_5FS - 4-F-thiophenol-SD - 10

I_5NO - 2-Pyridine aldehyde - 48

I_5NO_2 - Nitrobenzene - 10

I_6 - Benzvalene - 17

I_6 (C_6H_5D) - 6-Deutero fulvene - 17

I_6 - Dimethylenecyclobutene - 28

I_6O - phenol, phenol-OD, phenol-^{13}C - 10

I_6S - Thiophenol - 10

I_6Se - Selenophenol, selenophenol- SeD - 10

I_7N ($C_6H_5NH_2$) - Aniline - 48, 10

I_7N - 3-Methylenecyclobutanecarbonitrile - 42

I_7NO - N-methyl-2-pyridone - 16

I_7NO - 2 methoxy pyridine - 16

I_8 - Tricyclo[2.2.0.0]hexane - 17

I_8NO - 2-methoxypyridine - 16

$I_{10}F_2$ - Difluorocyclohexane - 3

$I_{10}O$ - 7-oxabicyclo[2.2.1.] heptane - 39

$I_{10}O_3$ - 4-methyl-2,6,7 trioxabicyclo [2.2.2] octane - 7

$I_{10}S$ - Cyclohexene sulfide - 38

$I_{10}S$ - 7-thiabicyclo-[2.2.1] heptane - 19

$I_{11}Cl$ - Cyclohexyl chloride - 3

$I_{12}Si$ - 1-Silabicyclo[2.2.1]heptane - 19

$I_{13}N$ - N-methyl piperidine - 38

I_5N - Pentafluorobenzonitrile - 46

I_4FeO_3 - 1,3 cyclobutadiene iron tricarbonyl - 7

C_7H_5BrO - m-bromobenzaldehyde - 9

C_7H_5ClO (C_6H_5COCl) - Benzoyl chloride - 42

$C_7H_5F_3$($C_6H_5CF_3$) - Benzotrifluoride - 4

C_7H_5N - Phenylisocyanide
2-D- "
$2,4\text{-}D_2$- " - 10
$2,4,6\text{-}D_3$- "

C_7H_5NO - Phenylisocyanate - 29

C_7H_5NS - Phenylisothiocyanate - 29

C_7H_6O - Tropone - 39

C_7H_7BrO - m-bromo anisole - 9

C_7H_7Cl ($CH_3C_6H_4Cl$) - Ortho-chlorotoluene - 11

C_7H_7F ($CH_2DC_6H_4F$) - $\alpha\text{-}d_1$-ortho-fluorotoluene - 11

C_7H_7F ($CH_2DC_6H_4F$, $CHD_2C_6H_4F$) - $\alpha\text{-}d_1$-,$\alpha\text{-}d_2$-para fluorotoluene - 11

C_7H_7F ($CH_2DC_6H_4F$, $CHD_2C_6H_4F$) - αd_1,$\alpha\text{-}d_2$-ortho-fluorotoluene - 11

C_7H_7FO - p-fluoroanisole - 2

$C_7H_7NO_3$ - p-Nitroanisole - 14

C_7H_8 - 16

C_7H_8 ($CH_2DC_6H_5$) - $\alpha\text{-}d_1$-toluene - 11

C_7H_8($CD_3C_6H_5$,$CH_3C_6H_4D$) - $\alpha\text{-}d_3$-toluene,2-3-, 4D-toluene - 11

C_7H_8BrN - m-bromo N-methyl analine - 9

C_7H_8O - Bicyclo(2.2.1)hepten-7-one - 6

C_7H_8O - Bicyclo[2.2.1]hepta-2-ene-7-one - 42

C_7H_8O - Tricyclo($2.2.1.0^{2,6}$)heptanone - 6

$C_7H_{10}O$ - Bicyclo[2.2.1]hepta-7-one - 42

$C_7H_{10}O$ - Bicyclo(2.2.1)heptan-2-one - 6

$C_7H_{10}O_3$ - 2,8,9 trioxadamantane - 7

$_7H_{11}N$ - Cyclohexyl cyanide - 3

$_7H_{11}N$ - 2,6-dimethyl pyridine - 53

$_7H_{12}O$ - Cycloheptene oxide - 43

$_8H_6$ - Phenyl acetylene - 4

$_8H_7Br$ - m-bromo aceto phenone - 9

$_8H_7NO$ - p-Anisonitrile - 14

$_8H_8O_2$ - Anisaldehyde - 14

$_8H_9Br$ - m-bromo ethyl benzene - 9

$_8H_{10}((CH_3)_2C_6H_4)$ - Ortho-xylene - 11

$_9H_8O$ - Cinnamaldehyde - 14

$_{10}H_7F$ - 1-fluoro-naphthalene - 13

$_{10}H_{15}X$ - 1-Halogenoadamantanes - 20
(H = F, Cl, Br)

$_{13}H_{20}O$ - α-Ionone - 14

$_{13}H_{20}O$ - β-Ionone - 14

$_{14}H_{22}O$ - α-Methylionone - 14

$_{14}H_{22}O$ - cis α-irone - 14

$_{14}H_{22}O$ - trans α-irone - 14

Cs - Cesium chloride - 12

HO - Hypochlorous acid - 18

$HO_4(HOClO_3)$ - Perchloric acid - 19

O - Chlorine monoxide - 19

$_3N(NCl_3)$ - Nitrogen trichloride - 3

F_2O_2 - Chromyl fluoride - 51

F - Cesium fluoride - 12

I - Cesium iodide - 12

H_3Si (SiH_3F) - Silyl fluoride - 21

(IF) - Iodine fluoride - 12

IO (NOF) - Nitrosylfluoride - 18

FS - Sulfur monofluoride - 19

FTl - Thallium fluoride - 12

F_2N (NF_2) - Nitrogen (II) fluoride - 28

F_2S(SF_2) - Sulfur difluoride - 30, 19

F_2Si (SiF_2) - Silicon difluoride - 19

F_2SO - Thionyl fluoride - 34

F_3HSi - Trifluorosilane - 39

$F_3H_3Si_2$ - 1,1,1-trifluorosilane - 43

F_3PO - Phosphoryl fluoride - 34

F_4S (SF_4) - Sulfur tetrafluoride - 19

F_5I - Iodine Pentafluoride - 21

GeS - Germanium sulphide - 12

HNO - Nitroxyl - 41

HNO_3 - Nitric acid - 30

HO (OH) - Hydroxyl radical - 38, 43, 49

H_3N (NH_3) - Ammonia - 32, 23

H_4N_2 (N_2D_4) - Hydrazine-d_4 - 17

IK (KI) - Potassium iodide - 12

IO - IO radical - 41

NO_2 - Nitrogen oxide - 32

N_2O_3 - Dinitrogen trioxide - 4, 27

OS_2 (S_2O) - Disulfur monoxide - 30, 12

OSi (SiO) - Silicon monoxide - 30

O_2 - Oxygen - 19

O_2S(SO_2) - Sulfur dioxide - 19

PbS - Lead sulphide - 12

SSi(SiS) - Silicon sulphide - 12

SSn(SnS) - Tin sulfide - 12

H_4P_2 (D_2PPD_2) - Tetradeuteriobiphosphine - 42

Diatomic molecules - 30