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

April 25, 1972

Dear Contributor:

This is the fifteenth 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.

1. Name of Institution: Allahabad University

   Name of Department or Institute: Physics Department

   Name to whom Queries should be addressed Professor Krishnaji

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$O\text{-}C_6H_4FBr$	O-fluoro-bromo-benzene	S.L. Srivastava and K.K. Kirty	Assignment Completed
$m\text{-}C_6H_4FBr$	m-fluoro-bromo-benzene	S.L. Srivastava and K.K. Kirty	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	v = o and v = 1 energy manifolds being refined.
C_4H_5NO	5 methyl isoxazole	J. N. Macdonald	Work continuing.
$C_3H_4N_2$	imidazole	J. H. Griffiths J. Sheridan	Quadrupole coupling tensors completely determined: r_s structure being completed.
$C_4H_6N_2$	N-methyl imidazole	H. U. Wenger	Ground state assigned.
C_3H_4S	propargyl mercaptan	J. Sheridan	Details of v = o and v = 1 energy manifolds being worked out in collaboration with University of Kiel and Monash University (F. Scappini and K. Bolton respectively). Work on isotopic forms.
C_3H_8S	isopropyl mercaptan	J. H. Griffiths	v = o $\longrightarrow$ v = 1 excitation determined for gauche form.
$C_2H_2N_2O$	2,4 - oxadiazole	D. Norbury	Work continuing.
C_4H_6O	oxaspiropentane	D. Norbury	Several lines measured.
C_3F_4 (CF_3CCF)	perfluoropropyne	T. D. Summers	Ground and first excited state constants; ^{13}C species; structure.
$C_3H_3F_3O_2(CF_3COOCH_3)$	methyl trifluoroacetic acid	T. D. Summers	Ground state of cis form assigned; internal rotor splittings.
C_4H_5NS	3-methyl isothiazole*	H. U. Wenger O. L. Stiefvater	Several D.R's observed; assignment in progress.
$C_4H_6O_2$	cyclopropyl carboxylic acid	T. D. Summers O. L. Stiefvater	D. R. assignment of ground and four excited states; approximate ratio for μ_A, μ_B; work on deuterated (CO_2D) specie

$C_2H_2N_2S$	2,4-thiadiazole	D. Norbury, O. L. Stiefvater	Structure by DR of ^{13}C species in progress; refined constants.
C_3H_5FO	propionyl fluoride	O. L. Stiefvater	Structure determination continuing (doubly substituted species).
$C_3H_6O_2$	propionic acid	O. L. Stiefvater	I. r_s structure of cis form approaching completion. II. Gauche forms assigned. Barrier determination in progress.
C_4H_8O	isobutyraldehyde	O. L. Stiefvater	Refinement of intensity data and potential function continuing.
C_4H_7FO	isobutyryl fluoride	O. L. Stiefvater	Tunnelling of gauche forms observed in T = 4 and T = 5; trans form in progress.
$C_4H_8O_2$	isobutyric acid	O. L. Stiefvater	Spectrum surveyed; assignment impending.
$C_2H_3ClO_2$ ($Cl\ COOCH_3$)	methyl chloroformate	D. Lister N. L. Owen	Main species assigned.
C_7H_7FO	p-fluoroanisole	N. L. Owen	Ground state assigned.
$C_4H_4O_2$ ($HCOOCH_2CCH$)	propargyl formate	G. I. L. Jones N. L. Owen	Tentative assignment of planar trans form.

3. Name of Institution Freie Universität Berlin

Name of Department or Institute II. Physikalisches Institut

Name to Whom Queries Should Be Addressed Prof. Dr. R. Honerjäger

1 Berlin 33, Boltzmannstraße 20

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
BrTl (TlBr)	Thallium bromide	E. TIEMANN	Stark effect measurements / Z.Naturforsch 26a, 1806 (1971)
I Tl (Tl I)	Thallium iodide	E. TIEMANN	

GeTe	Germanium telluride	J. HOEFT E. TIEMANN T. TÖRRING	HFs, Z.Naturforsch. 26a, 1930 (1971
BrCs (CsBr)	Cesium bromide		HFs, to be published
NP (PN)	Phosphorus nitride		Rotational spectrum, HFs, to be published
SSi (SiS)	Silicon sulphide		Deviations from B.O. approxim.in the rot. spectrum, to be published
ClGa (GaCl)	Gallium chloride		Rotational spectrum, HFs, to be published
IK (KI)	Potassium iodide		HFs, measurements nearly complete
BaO	Barium oxide		Rotational spectrum, HFs, remeasurements
CsI	Cesium iodide		HFs, to be published
AlBr	Aluminum bromide		HFs assigned
AlI	Aluminum iodide		HFs assigned
ClIn (InCl)	Indium chloride		Stark effect measurements, to be publish

TlF	**Thallium fluoride**	**R. Honerjäger** **R. Tischer**	**g_J-factors and magnetic susceptibility anisotropy from Zeeman-effect in the microwave rotational spectrum to be published**
CsF	**Cesium fluoride**		
CsCl	**Cesium chloride**		
CsBr	**Cesium bromide**		
CsI	**Cesium iodide**		
SnS	**Tin sulfide**		

4. Name of Institute: Istituto Chimico "G. Ciamician", University of Bologna and Laboratorio di Spettroscopia Molecolare, National Research Council, Bologna

Name to Whom Queries should be adressed: Prof. Paolo G. Favero

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_5H_4NBr	2-Bromopyridine 4-Bromopyridine	Caminati Forti	NQHFS. Manuscript in preparation.

$(CH_3)_2NPF_2$	Dimethylamino-difluoro-phosphine	Favero Damiani Forti	Sent for publication.
$C_6H_{11}Cl$	Cyclohexyl chloride	Damiani Ferretti	Spectrum of equatorial species assigned. NQHFS analyzed.
$C_6H_{10}F_2$	Cyclohexyl difluoride.	Damiani Ferretti	Spectrum assigned. Dipole moment.
C_3H_4O	Propargyl alcohol	Corbelli Mirri	Millimetre spectrum in progress.
C_2H_3NO	Glycollonitrile	Lister Cazzoli Mirri	Barrier to internal rotation evaluated. Manuscript in preparation.
NH_2Cl	Monochloroamine	Cazzoli Lister Favero	Spectrum and NQHFS analyzed. In press.
NH_2Cl	Monochloroamine	Cazzoli Lister	Inversion splitting and barrier. Manuscript in preparation.
C_6H_{10}	1-Esyne	Damiani Mirri	Two conformers identified.
$N(CH_3)HCl$	Mono-chloro-methylamine	Mirri Camianti	Spectrum assignment in progress.
C_6H_6FN	Meta-fluoro-aniline	Lister Cazzoli Damiani	Spectrum of normal and deuterated species at nitrogen. Manuscript in preparation.

5. UNIVERSITY OF BRISTOL
School of Chemistry
Bristol BS8 1TS
England.

A. Peter Cox

CH_3NO	**Nitrosomethane**	**Isotopic work and centrifugal distortion in progress**
CH_3NO_2	**Nitromethane**	**Structure published**
CH_3NO_3	**Methyl nitrate**	**Structure published**
HNO_2	**Nitrous acid**	**Structure, centrifugal distortion and force field published.**

N_2O_3	Dinitrogen trioxide	Quadrupole coupling in manuscript
C_5H_5In	Cyclopentadienyl indium	Structure/quadrupole/ excited states to be published
C_5H_5Tl	Cyclopentadienyl thallium	Coriolis published; structure complete
C_5H_5NiNO	Cyclopentadienyl nitrosyl nickel	Analysis of higher excited states complete
C_5H_5PtNO	Cyclopentadienyl nitrosyl platinum	Structures to be published
$C_5H_5TiC_7H_7$	Cyclopentadienyl titanium cyclopentadienide	
$C_6H_5C_2H(D)$	Phenyl acetylene	Assignment and dipole in manuscript

6. **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
$C_6H_{10}O_3$	4-methyl-2,6,7-trioxabicyclo[2,2.2] octane	W. D. Slafer	Assigned
$C_7H_{10}O_3$	2,8,9 trioxadamantane	W. D. Slafer	Assigned
$C_4H_{11}P$ $[(CH_3)_3P{=}CH_2]$	trimethyl methylene phosphorane	W. D. Slafer	In progress
$C_3H_4F_2$	2,3 difluoropropene	A. D. English	In progress
BaO	Barium Oxide	R. W. Field	Microwave optical double resonance observed. (in press)

7. Name of Institution University of Cincinnati

Name of Department or Institute Chemistry

Name to Whom Queries Should Be Addressed Clarence H. Thomas

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_2H_4FCl (CH_3CHFCl)	1,1-fluorochloroethane	C. Thomas	Spectrum assigned

8. COPENHAGEN

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CH_2N_2	diazomethane	J.P.Jacobsen N.Wessel Larsen	both mono-^{15}N-species with hfs observed
CH_3NO ($HCONH_2$)	formamide	Claus Nielsen G.O.Sørensen	ground state reinvest. incl. high-J lines, exc. states assigned
$C_2H_2N_2O$	1,3,4-oxadiazole		in press
$C_2H_3N_3$	1,2,3-triazole	G.O.Sørensen	1-D-species assigned
C_2H_4ClN	1-Cl-aziridine	Steen Skaarup	10 isotopic species assigned, in press
C_2H_5N	aziridine (ethylenimine)	Steen Skaarup	J.Mol.Structure 10(1971)385
$C_3H_4N_2$	pyrazole	Dines Christen Ole Snerling Lise Nygaard G.O.Sørensen	^{15}N-species assigned, manus. in prep.
$C_4H_2N_2$ ($NC-CH=CH-CN$)	maleonitril	Peter Jansen Børge Bak	normal species recorded no assignment
C_5H_5N	pyridine	G.O.Sørensen	manus. in prep.
C_5H_5NO	pyridine N-oxide	Ole Snerling G.O.Sørensen	51 transitions assign. and measured, ring-subst. isotopic species prepared

C_6H_5BrO	4-bromo-		
C_6H_5ClO	4-chloro- } phenol	N.Wessel Larsen	paper in progress
C_6H_5FO	4-fluoro-		
$C_6H_5NO_2$	nitrobenzene	Jens H.Høg G.O.Sørensen	r_s-structure det'd, manus. in prep.
C_6H_6O	phenol	N.Wessel Larsen	exc. states, paper in progress
	phenol-OD	"	exc. states, paper in progress
	phenol-^{13}C	"	6 species assigned, paper in progress, r_s-structure det'd
C_6H_6S	thiophenol	Leif Schulz	-SH and -SD species assigned, barrier determined
C_6H_7N	aniline	Jens H.Høg N.Wessel Larsen	^{13}C-species assigned, dipole moment of ground and 1. exc. state
$C_7H_6O_2$	salicylaldehyde	T.Pedersen	assigned

9. **Name of Institution** UNIVERSITY OF DELHI, DELHI 7,INDIA

Name of Department or Institute DEPARTMENT OF PHYSICS AND ASTROPHYSICS

Name to Whom Queries Should Be Addressed Dr.G.P.SRIVASTAVA

FORMULA*	**NAME OF COMPOUND**	**NAME OF INVESTIGATOR****	**PRESENT STAGE OF PROGRESS**
Line broadening studies of following is being carried out:-			
COS(OCS)	Carbonyl Sulphide		Pressure Broadening
$C_2H_3N(CH_3CN)$	Methyl Cyanide		-do-
$CH_2O(HCHO)$	Formaldehyde		-do-
CH_3I	Methyl Iodide		Perturber in foreign gas broadening.
CO_2	Carbondioxide		-do-
N_2	Nitrogen		-do-

10. 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.Heimburger	work concluded, paper in preparatio
C_2H_6S ($(CD_3)_2S$)	d_6-dimethylsulfide	B. Tan	work concluded, paper in preparatio
C_3H_7N (CH_2=$CHCH_2NH_2$)	allylamine	I. Botskor in collaboration with Nancy	two N-gauche rotamers assigned, tors. exc.states for N-cis and N-gauche rotamers
C_4H_6O ($(CH_3)_2CCO$)	dimethylketene	K.P.R.Nair, H.D.Rudolph in collaboration with Kiel	work restarted and concluded
C_5H_8 ($(CH_3)_2CCCH_2$)	dimethylallene	J. Demaison	to be continued late 72
$C_7H_6F_2$ ($CH_3C_6H_3F_2$)	difluorotoluene	D. Schwoch	in progress
C_7H_7F ($CH_2DC_6H_4F$)	α-d_1-para-fluorotoluene	H. Schleser	spectra m=0,3 assigned
C_7H_7F ($CH_2DC_6H_4F$)	α-d_1-ortho-fluorotoluene	D. Schwoch	g.s.spectra of two rotameric forms assigned
C_7H_7Cl ($CH_3C_6H_4Cl$)	ortho-chlorotoluene	K.P.R.Nair	g.s.spectrum identified
C_7H_8 ($CH_2DC_6H_5$)	α-d_1-toluene	H. Schleser	spectrum m=o assign
C_7H_8 ($CD_3C_6H_5$, $CH_3C_6H_4D$)	α-d_3-toluene, 2-,3-,4D-toluene	W.A. Kreiner B. Tan	work concluded
C_8H_9F ($(CH_3)_2C_6H_3F$)	dimethylfluorobenzene	D. Schwoch	discontinued
C_8H_{10} ($(CH_3)_2C_6H_4$)	ortho-xylene	K. Walzer H.D.Rudolph	work concluded paper in preparation

11. UNIVERSITY OF GLASGOW

DEPARTMENT OF CHEMISTRY

J. K. TYLER

CH_2N_2 (NH_2CN)	Cyanamide	J. K. TYLER	Paper on μ_a spectra impress.
CF_2N_2 (NF_2CN)	Difluorocyanamide	S. A. MACKAY	Approximate values for quadrupole coupling constants.
C_6H_7N ($C_6H_5NH_2$)	Aniline	J. K. TYLER (with J. Høg and N. Wessel-Larsen, U of Copenhagen)	r_s structure complete. Manuscript in preparation.
C_6H_6NF ($F\ C_6H_4NH_2$)	Parafluoroaniline	J. K. TYLER	Further work on -NHD species
CNF (FCN)	Fluorine cyanide	J. K. TYLER	Novel, in waveguide synthesis.

12. HARVARD UNIVERSITY

DEPARTMENT OF CHEMISTRY

E. Bright Wilson

$C_7H_6O_2$	6-Hydroxy-2-formyl fulvene	H.M. Pickett	Compound and one deuterium isotope assigned.
$C_2H_4N_2$	Amino acetonitrile	H.M. Pickett	Trans form assigned for compound and amin deuterium isotopes.

C_3H_6O	Propanal	H.M. Pickett	gauche form vib-rot interactions analyzed.
C_4H_7Cl $(CH_2C(CH_3)CH_2Cl)$	iso-butenyl chloride	D.J. Finnigan	skew form assigned for ^{35}Cl, ^{37}Cl isotopic species. Tentative assignment for cis rotamer.
$C_2H_3NO_2$ $HN(CHO)_2$	diformamide	W.E. Steinmetz	type R branch transitions assigned for near prolate confomer.
ICl	iodine monochloride	E. Herbst & W.E. Steinmetz	J=2—1 transitions assigned for v=0,1. Dipole moment measured. Manuscript accepted by J. Chem. Phys.
C_4H_7N	n-propyl isonitrile	M. Fuller	Ground and excited states assigned for two rotamers.
C_3H_7ClO	1-chloro-3-hydroxypropane	M. Fuller	Tentative assignment of one form.
$C_2H_5NO_3$	ethyl nitrate	D. Scroggin J. Riveros	Two forms assigned.
C_3H_4ClN $(ClCH_2CH_2CN)$	3-chloropropionitrile	I. Warren	Two forms assigned.

13. HEWLETT-PACKARD CO.
Scientific Instruments Division
1601 California Avenue
Palo Alto, California 94304
LeRoy H. Scharpen

$C_2H_4O_3$ $(CH_2OHCOOH)$	glycolic Acid	v= 0 to v=4 torsional states assig... torsional energies determined.

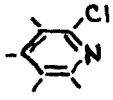
14. Name of Institution UNIVERSITY OF KANSAS

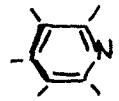
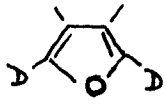
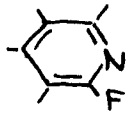
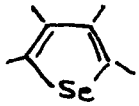
Name of Department or Institute DEPARTMENT OF CHEMISTRY

Name to Whom Queries Should Be Addressed MARLIN D. HARMONY

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$CH_5NO(CH_3ONH_2)$	Methoxyamine	Johnson	Normal species assigned
$C_5H_7N(C_4H_7CN)$	Cyclobutylcyanide	Fong	Ground state spectrum assigned
C_5H_8	Bicyclo[2.1.0]pentane	Suenram	In press
N_2D_4	Hydrazine-d_4	Harmony	Assignment underway

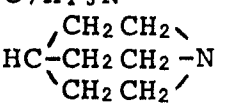
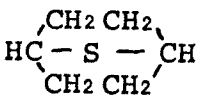
15. Name of Institution: Universität Kiel, Germany
Name of Institute: Institut für Physikalische Chemie
Name to Whom Queries Should Be Addressed: H. Dreizler

Formula		Name of Compound	Name of Investigator	Present Stage of Progress
C_3H_5N	CH_3-CH_2-CN	Propionitrile	H. Mäder	Torsion-vibration interaction, manuscript in preparation.
$C_3H_3D_2N$	CH_3-CD_2-CN	2,2-Dideutero-propionitrile	M. Heise	Spectrum assigned
C_2H_3SN	$CH_3-S-C\equiv N$	Methyl rhodanate	U. Andresen	Torsion-vibration interaction.
$C_2H_3D_3S_2$	$CH_3-S-S-CH_3$	Dimethyl disulfide	M. Kuhler	Torsion-vibration analysis.
CH_3SCl	CH_3-S-Cl	Methane sulfenyl-chloride	A. Guarnieri	Partial r_s-structure.
C_5H_4NCl		2-Chloropyridine	F. Scappini A. Guarnieri	Spectrum assigned. Quadrupole coupling.consta Manuscript in preparation.

C_4H_6O	$CH_3\diagdown C=C=O$ $CH_3\diagup$	Dimethylketene	D. Sutter H. Dreizler L. Charpentier	Zeeman studies, in press.
C_5H_4N		Pyridine	E. Hamer	Zeeman studies of different isotopic species sign of μ electri Manuscript in preparation.
C_2H_6S	CH_3-S-CH_3	Dimethyl sulfide		
$C_4H_2D_2O$		2,5-Dideutero-furane	B. Bak, H. Dreizler E. Hamer D. Sutter	Zeeman studies, in press.
C_5H_4NF		2-Fluoropyridine	R. Schwarz	Excited states.
COFCl	$F\diagdown C=O$ $Cl\diagup$	Carbonyl fluoro-chloride	A. Guarnieri	Zeeman studies
C_4H_4Se		Selenophene	W. Czieslik	Zeeman studies
C_3H_4S	$HC\equiv C-CH_2-SH$	Propargyl mercaptan	F. Scappini	Ground state and excited states assigned.
HOCl	H-O-Cl	Hypochlorous acid	F. Scappini A. Guarnieri	Zeeman studies.
NOF	N-O-F	Nitrosyl fluoride	A. Guarnieri H. Dreizler	Zeeman studies

CDNO (DCNO)	Deutero-fulminic acid	M. Winnewisser B. P. Winnewisser	MMW spectrum, in progress
CHNO (HCNO) CDNO (DCNO)	Fulminic acid	F. Mie M. Winnewisser	Stark-effect meas. in progress
CHNS (HNCS)	Isothiocyanic acid	M. Winnewisser	MMW spectrum in progress
C_5H_9NO $((CH_3)_3CCNO)$	Pivalo-nitile oxide	M. Winnewisser	Excited vib. states partially assigned
$C_5H_{10}O$ $((CH_3)_3CCHO)$	Pivaldehyde	M. Winnewisser	Q branches assigned

16. Kyushu University
Department of Chemistry
Eizi Hirota

C_5H_8 $[CH_2=CHCH_2CH=CH_2]$	1,4-Pentadiene	T. Shigemune E. Hirota	One rotamer assigned.
ClNS(NSCl)		S. Mizumoto J. Izumi	In press (Bull. Chem. Soc. Japan).
O_2	Oxygen	T. Amano	Manuscript in preparation.
CH_3F	Methyl fluoride	T. Tanaka	Vibration-rotation interaction; work in progress.
$F_2Si(SiF_2)$	Silicon difluoride	H. Shoji	ν_1 and ν_3 Spectra; work almost completed.
AsF_3	Arsenic Trifluoride	T. Chikaraishi	Vibration-rotation interaction; work in progress.
$CH_3NS(CHSNH_2)$	Thioformamide	R. Sugisaki	Work almost completed.
$CH_3NO(CHONH_2)$	Formamide	R. Sugisaki	Work almost completed.
$CH_6Si(CH_3SiH_3)$	Methyl silane	E. Hirota	Manuscript submitted to J. Mol. Spectrosc.
$C_7H_{13}N$ 	Quinuclidine	S. Suenega	In press (J. Mol. Spectrosc.).
CNO(NCO)		T. Amano	Excited vibrational state ($^2\Delta_{3/2}$, $^2\Delta_{5/2}$); manuscript in preparation.
BrO	Bromine monoxide	A. Yoshinaga	Excited vibrational state and dipole moment; work almost completed.
$C_6H_{10}S$ 	7-Thiabicyclo-[2.2.1]heptane	K. Irie	Assigned.
CH_3Cl, CD_3Cl	Methyl chloride	M. Hirashita	Vibration-rotation interaction; work in progress.
$ClHO_4(HOClO_3)$	Perchloric acid	K. Fujimoto	Assigned.
CH_2F_2, CD_2F_2	Methylene fluoride	M. Sahara	Vibration-rotation interaction; work in progress.

FS	Sulfur monofluoride	T. Amano	Assigned ($^2\Pi_{3/2}$).
ClO	Chlorine monoxide	T. Amano	Excited vibrational state ($^2\Pi_{1/2}$); work almost completed.
C_3H_8O $[(CH_3)_2CHOH]$	Isopropanol	E. Hirota	Work in Progress.
C_3H_4 ($H_2C=C=CD_2$)	Allene	E. Hirota	Assigned.

17. Name of Institution Université Laval

Name of Department or Institute Chemistry Department, Quebec, Canada.

Name to Whom Queries Should be Addressed P. Buckley

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$CF_4O(CF_3OF)$	Trifluoromethyl-hypofluorite	Jean Weber	Ground state spectrum assigned
$C_2H_4S_2$ $(CH_2(SH)_2)$	Dithio methane	Jean Weber	Ground state spectrum partially assigned
$C_3H_6O_2$ (CH_3COCH_2OH)	Acetol (2-propanone-1-hydroxy)	M.L. Brochu	Ground state spectrum partially assigned
$C_3H_6O_3$ $(CH_2OHCOOCH_3)$	Methyl glycolate	M.L. Brochu	Ground state spectrum partially assigned

18.
Name of Institution UNIVERSITE DES SCIENCES ET TECHNIQUES de LILLE

Name of Department or Institute DEPARTMENT DE PHYSIQUE

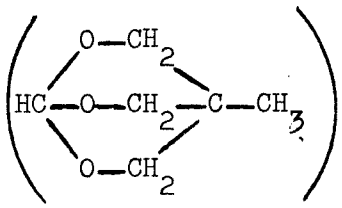
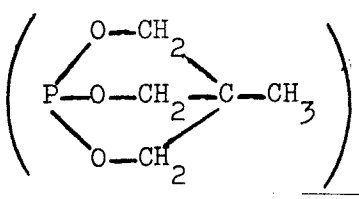
Name to Whom Queries Should Be Addressed Monsieur WERTHEIMER.

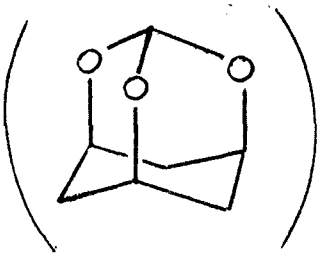
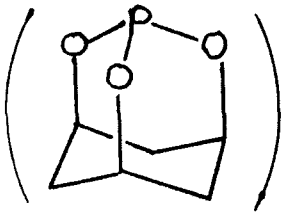
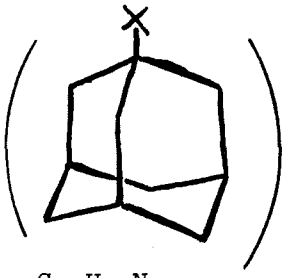
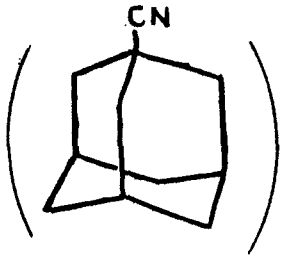
FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
SF_5Cl		J. BELIET	ground state assigne

SOF_2 (ground state)	Thionyl fluoride	A. DUBRULLE J.L. DESTOMBES G. JOURNEL	spectrum assigned
SOF_2 (excited state)	Thionyl fluoride		spectrum assigned
$SO_2Cl^{35}Cl^{35}$	Sulfuryl chloride		spectrum assigned
$SO_2Cl^{35}Cl^{37}$	Sulfuryl chloride		spectrum assigned
$SOCl^{35}Cl^{35}$	Thionyl chloride		spectrum assigned
$SOCl^{35}Cl^{37}$	Thionyl chloride		assignment in progress
CH_3NO_2	nitro-méthane	F. ROHART	assignment in progress
SO	SO radical	J. BURIE C. MARLIERE	studies of transient species.
NS	NS radical		
OH	OH radical		
$C_2H_3N(CH_3NC)$	methyl isocyanide	A. BAUER M. GODON	excited states
H_2O	Water	J. BELIET	ground and ν_2 excited states of the stable isotopic species.
$CH_2O_2(HCOOH)$ $CD_2O_2(DCOOD)$ $CHDO_2(HCOOD)$ $(DCOOH)$	formic acid	M. WILLEMOT J. BELIET	ground and ν_7 and ν_8 excited states spectrum assigned.
$C_3H_6O_3(H_2CO)_3$	Trioxane	J. COLMONT	excited states in progress. Spectrum of the asymetric forms in C^{13} and O^{18} assigned.
$CH_2O(H_2CO)$ $CHDO(HDCO)$ $CD_2O(D_2CO)$	formaldéhyde	M. DANGOISSE J. BELIET	ground states assigned excited state in progress.

O_3	Ozone	M. DEPANNEMAEKER J. BELIET	ground states of the O^{18} isotopic species.

19. UNIVERSITY COLLEGE LONDON
Department of Chemistry
London, England
D. J. Millen/A. C. Legon

C_5H_6O (CH_2-CH_2-CH=CH-CO)	Cyclopent-2-en-1-one	D. Chadwick	Ring puckering potential under investigation.
C_5H_6O (CH_2-CH_2=CH-CH_2-CO)	Cyclopent-3-en-1-one	J. W. Bevan	Vibrational satellites and ^{13}C species under investigation.
C_4H_7NO (CH_2-$(CH_2)_2$-NH-CO)	Pyrrolidone	J. W. Bevan	Normal species and N-D spectra assigned.
$C_4H_6O_2$ (CH_2-$(CH_2)_3$-O-CO	γ-Butyrolactone	J. W. Bevan	Preliminary publication. Further work in progress.
$C_4H_4O_2$ (O-CH_2-CH=CH-CO)	γ-Crotonolactone	A. Wardley	Vibrational satellite. work in progress.
$C_6H_{10}O_3$ 	4-Methyl 2,6,7 trioxabicyclo[222]-octane	C. Bush	Spectrum assigned.
$C_5H_9O_3P$ 	1-Methyl 4 phospha 3,5,8 trioxa-bicyclo[222]octane	C. Bush	Spectrum assigned.

$C_7H_{10}O_3$	Trioxaadamantane	C. Bush	Spectrum assigned.
			
$C_6H_9O_3P$	1-Phospha 2,8,9 trioxaadamantane	C. Bush	Spectrum assigned.
			
$C_{10}H_{15}X$	1-Halogenoadamantanes (H = F, Cl, Br)	C. Bush	^{13}C species assigned.
			
$C_{11}H_{15}N$	1-Cyanoadamantane	D. Chadwick	Manuscript in preparation.
			
ClF_5Te	Tellurium chloride pentafluoride	A. C. Legon	Manuscript in preparation.
$C_5H_{11}N$	Piperidine	J. E. Parkin	Manuscript in preparation.

20. Name of Institution Louisiana State University New Orleans

Name of Department or Institute Physics

Name to Whom Queries Should Be Addressed E.L. Beeson

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$C_4H_8O_2$ ($CH_2CH_2OCH_2OCH_2$)	1,3-dioxane	Mary S. White	Measuring Spectru

21. Name of Institution : University of Louvain, Belgium

Name of Department or Institute : Institut de Physique Corpusculaire - Département de Physique Moléculaire - Av. Baudouin 1er - 1340 OTTIGNIES - Belgique

Name to Whom Queries Should Be Addressed : Dr. A. FAYT

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CD_2CDBr	Vinyl Bromide	J. MAROOR	Spectrum assigned
$^{16}O^{32}S^{18}O$	Sulfur Dioxyde	R. VAN RIET	Spectrum assigned
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$H_2{}^{16}O$	Water	G. STEENBECKELIERS	Spectrum assigned
$H_2{}^{17}O$			
$H_2{}^{18}O$			
$HD^{16}O$			
$HD^{17}O$			
$HD^{18}O$			
$D_2{}^{16}O$			
$D_2{}^{17}O$			
$D_2{}^{18}O$			

$HT^{16}O$			
$T_2{}^{16}O$			
CH_3CH_2OH	Ethyl Alcohol	J.P. CULOT	Spectrum assigned
$^{13}CH_3CH_2OH$			
$CH_3{}^{13}CH_2OH$			
$^{13}CH_3{}^{13}CH_2OH$			
CH_2DCH_2OH			
CH_3CHDOH			
CH_3CH_2OD			
CH_3CD_2OH			
CH_3CHDOD			
CD_3CH_2OH			
CD_3CD_2OH			
CD_3CD_2OD			
$CH_3CH_2{}^{18}OH$			

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
GeH_3Br	Germyl bromide	S. Wolf L. C. Krisher	In press (J. Chem. Phys.)
GeH_3I	Germyl iodide		
GeH_3Br	Germyl bromide	S. Wolf L. C. Krisher	"v" states manuscript stage

GeH_3F	Germyl fluoride	W. Watson	In progress
$C_2DH_3O_2$	Acetic acid - d_1	W. Watson L. C. Krisher	In progress

23. Name of Institution Massachusetts Institute of Technology

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should Be Addressed Stephen G. Kukolich room 2-039

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
CH_2F_2	Difluoro methane	Kukolich, Wang and Ruben	High Resolution Spectra obtained
$CClH_3$ (CH_3Cl)	Methyl Chloride	Kukolich	High Resolution Spectra obtained
C_2H_3N (CH_3NC)	Methyl Isocyanide	Kukolich	High Resolution Spectra obtained
H_3N (NH_3)	Ammonia	Kukolich and Ruben	Zeeman Spectra obtained
CF_2O	Carbonyl Fluoride	Wang and Kukolich	High Resolution Spectra obtained

24. McDonnell Douglas Corporation

McDonnell Douglas Research Laboratories

James E. Wollrab

Formula	Name of Compound	Investigator	Process
$C_2H_4O_2$	Acetic Acid	with John Raley	$C^{13}H_3C^{13}OOH$ $CH_3CO^{18}O^{18}H$ and CD_3COOH assigned
$C_4H_4Cl_2$	dichloromethylenecyclopropane	with Ron Mitchell	preliminary assignment of $Cl^{35}Cl^{35}$

25. Name of Institution Memphis State University

Name of Department or Institute Department of Chemistry Memphis, Tenn.

Name to Whom Queries Should Be Addressed Robert G. Ford

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_2H_3ClO (CH_2ClCHO)	Chloroacetaldehyde	R. Ford	2 rotamers assigne
C_5H_6 ($CH_3CHCHCCH$)	trans 3-penten-1-yne	L. Szalanski	in press

26. Name of Institution Michigan State University, East Lansing, Michigan 48823

Name of Department or Institute Department of Chemistry

Name to Whom Queries Should be Addressed R. H. Schwendeman

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_5H_8 ($CH_2CH_2CHCHCH_2$)	Vinylcyclopropane	E. Codding	Manuscript in Preparation

C_5H_8O ($CH_2CH_2CHCOCH_3$)	Cyclopropyl Methyl Ketone	P. Lee	Manuscript in Preparation
$C_3H_4O_2$ ($CH_2OCHCHO$)	Glycidaldehyde	P. Manor	Manuscript in Preparation
C_3H_7NO ($HCON(CH_3)_2$)	Dimethylformamide	A. Brittain, R. El-Zaro	Parent, d_7, and CD_3 (cis and trans) assigned
C_4H_8O ($CH_3CH_2CH_2CHO$)	n-Butyraldehyde	P. Lee	Two rotamers, manuscript in preparation
CF_2NP (PF_2CN)	Cyanodifluorophosphine	P. Lee, K. Cohn	Accepted for publication, Inorg. Chem.
CF_2N_2 (NF_2CN)	Difluorocyanamide	P. Lee, K. Cohn	Accepted for publication, Inorg. Chem.
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. El-Zaro	Assigned

27. **University of Michigan**
Department of Chemistry
R. L. Kuczkowski

$C_2H_4O_3$ (H_2COOCH_2O)	**1,2,4-trioxa-cyclopentane**	**C. Gillies**	**Paper submitted**
C_5H_5P	**Phosphabenzene**	**R. Kuczkowski**	**In press (J. Mol. Spec.)**
C_5H_5As	**Arsabenzene**	**R. Kuczkowski**	**In progress**
C_5H_4 ($CH\equiv C-CH_2-C\equiv CH$)	**1,4-pentadiyne**	**R. Kuczkowski**	**In progress**
N_2O_3	**Dinitrogen tri-oxide**	**R. Kuczkowski**	**Vibrational satellites**
$C_3H_{12}BP((CH_3)_3PBH_3)$	**Trimethylphosphine borane**	**P. Bryan**	**In press (Inorganic Chem.)**
$CH_8BP(CH_3PH_2BH_3)$	**Methylphosphine borane**	**P. Bryan**	**In press (Inorganic Chem.)**

28. Name of Institution University of Missouri, Columbia, Missouri 65201

Name of Department or Institute Department of Chemistry

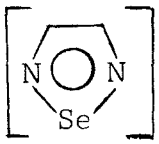
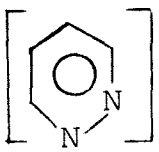
Name to Whom Queries Should Be Addressed Professor H. Kim

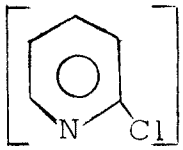
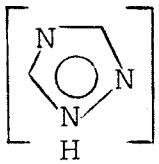
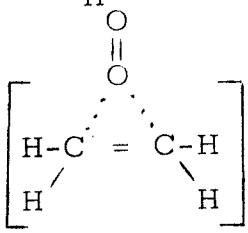
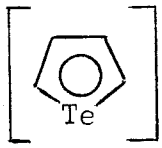
FORMULA	NAME OF COMPOUND	PRESENT STAGE OF PROGRESS
$(CH_2)_2SO_2$	Ethylene Sulfone	Submitted to J.C.P.
HOF	Hypofluorous Acid (With Prof. Pearson of SIU)	Centrifugal distortion effect
$\overrightarrow{CH_2OCHCH_2F}$	Epifluorohydrin	3 rotomers assigned manuscript in prep.
$\overrightarrow{CH_2OCHCH_2Cl}$	Epichlorohydrin	3 rotomers assigned
$(CH_2)_2CHCH_2Cl$	Cyclopropylcarbinyl chloride	2 rotomers assigned

29. 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
$C_2H_2N_2Se$ 	selenadiazole	A. Mishra	quadrupole coupling and ^{13}C studies proceeding
NF_2	nitrogen (II) fluoride	I. Gillard	basic spectrum assigned
$C_4H_4N_2$ 	pyrimidine	E. Clarke	^{13}C spectrum assigned work continuing

C_5H_4NCl		o-chloropyridine	P. Baron	spectrum assigned NQC studies in progress
$C_4H_4Cl_2$		o and m-dichlorobenzene	J. Matouskova	work in progress
$C_2H_3N_3$		1, 2, 4-triazole	A. Mishra	^{13}C assigned NQC rear completion
$C_2H_4O_2$		peroxirane	W. Garland	work in progress
CrF_4		chromium (iv) fluoride	P. Burton	work continuing
C_4H_4Te		tellurophene	R.D. Brown	work in progress
CN_4	NCN_3	cyanogen azide	K. Bolton	paper in preparation.

30. UNIVERSITY OF NANCY
Laboratoire de Chimie Théorique
Case Officielle N° 72 - NANCY, (France)
J. BARRIOL, G. ROUSSY

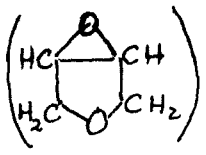
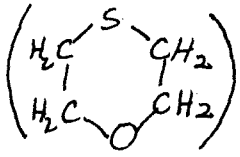
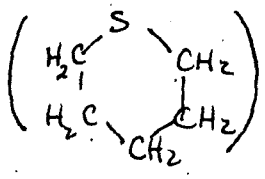
C_3H_7N (CH_2=$CHCH_2NH_2$)	Allylamine	G. Roussy in collaboration with Freiburg	- Gauche rotamer in Progress
C_4H_5NS(CH_2=$CHCH_2NCS$)	Isothiocyanate d'allyle	A. Bouchy	- Work in progress

C_4H_3N (CH_2=C=CHCN)	Cyanoallene	J. Demaison A. Bouchy	- Manuscrit prepared - Centrifugal distorsion
C_3H_3Cl (CH_2=C=CHCl)	Chloroallene	J. Demaison	- Temporarily interrupted
C_3H_3Br (CH_2=C=CHBr)	Bromoallene	J. Demaison	- Studying quadrupole interaction
C_3H_3F (CH_2=C=CHF)	Fluoroallene	J. Demaison	- Temporarily interrupted

31. **Name of Institution** National Bureau of Standards

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
$C_4H_6O_2$ 	3,6-dioxabicyclo [3.1.0] hexane	W. J. Lafferty	spectrum assigned, boat conformation determined
C_4H_8OS 	Thioxane	W. J. Lafferty	Spectrum Assigned Chair conformation determined
$C_5H_{10}S$ 	pentamethylene sulfide	W. J. Lafferty	Spectrum Assigned, chair conformation determined
FCN	cyanogen fluoride	W. J. Lafferty	publication awaiting completion of IR work

CH_3N (CH_2NH)	methylene imine	Johnson, Lovas	isotopic species in progress
CH_3NO ($CHONH_2$)	formamide	Kirchhoff, Johnson	Centrifugal distortion, manuscript in preparation
CF_2	Carbon Difluoride	Kirchhoff	Centrifugal Distortion, Manuscript in preparation
SF_2	Sulfur Difluoride	Kirchhoff, Johnson	"
ClF_5	Chlorine pentafluoride	Kirchhoff	manuscript in preparation
CH_5N (CH_3NH_2)	methyl amine	Johnson Lovas Kirchhoff	Additional measurements & critical analysis for radioastronomy purposes.
CH_2S (H_2CS)	thioformaldehyde		
CH_2O (H_2CO)	formaldehyde		
CF_6Si (SiF_3CF_3)	Perfluoromethylsilane	Lide, Johnson	manuscript in preparation

32. Name of Institution: University of New Brunswick

Name of Department or Institute: Physics and Chemistry

Name of Whom Queries Should Be Addressed: Dr. K.V.L.N. Sastry

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STATE OF PROGRESS
C_4H_7DO (C_3H_5CHDOH / C_3H_5CDHOH)	Cyclopropyl Carbinol	Kamala Sastri	Spectrum assigned

C_4H_5N	Allyl iso-cyanide	H. Pavaday	In progress
$C_3H_6O_2$	Glycidol	W. V. F. Brooks K. V. L. N. Sastry	Spectrum assigned
CH_4O (CH_3OH)	Methyl Alcohol	R. M. Lees S. S. Haque	Vibrational state and C-13 species
CD_4O (CD_3OD)	Methyl Alcohol	R. M. Lees	Manuscript submitted
C_3H_9N ($CH_3CH_2CH_2NH_2$)	n-Propylamine	S. S. Haque R. M. Lees	In progress

33.

University of Newcastle upon Tyne,
The Physical Chemistry Department,
Newcastle upon Tyne,
NE1 7RU.
England.

D.H. WHIFFEN

F_2CO	**Carbonyl Fluoride**	**J.H. Carpenter**	**$^{18}O^{13}CF_2$ and excited vib. states**
CF_3NO	**Trifluoronitrosomethane**	**J.G. Smith**	**Spectrum measured**
C_2HI	**Iodoacetylene**	**D.F. Rimmer**	**Search in progress**
F_2SO	**Thionyl Fluoride**	**J.G. Smith D.F. Rimmer**	**Excited vib. states assigned**

34. Name of Institution: Northeastern University

Name of Department: Department of Chemistry

Name to Whom Queries Should be Addressed: Ravi Varma

Formula	Name of Compound	Name of Investigator	Present Stage of Progress
$H_9Si_3P[(SiH_3)_3P]$	Silylphosphine	Ravi Varma	Spectrum 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 STAGE OF PROGRESS
$C_3BrN(BrCCCN)$	Bromocyanoacetylene	T. Bjorvatten	Manuscript
$C_3ClN(ClCCCN)$	Chlorocyanoacetylene	T. Bjorvatten	to be
$C_3IN(ICCCN)$	Iodocyanoacetylene	T. Bjorvatten	submitted
$C_3H_5NS(CH_3CH_2SCN)$	Ethylthiocyanate	A. Bjørseth	In press
$C_3ClF_3(CF_3CCCl)$	Trifluoromethylchloro-acetylene	A. Bjørseth	Writing up
$C_3H_5NO(CH_3CH_2NCO)$	Ethylisocyanate	A. Bjørseth	Many lines measured
$C_5H_5BeCl(C_5H_5BeCl)$	Cyclopentadienylberyllium chloride	A. Bjørseth/ H. Møllendal	Writing up
$C_2H_6O_2(HOCH_2-CH_2OH)$	Ethyleneglycol	H. Møllendal	Partial assignment
$C_2H_6O_2(DOCH_2-CH_2OD)$	d_2-Ethyleneglycol	H. Møllendal	Spectrum measured
$C_2H_2O_3(CHO-COOH)$	Glyoxylic acid	H. Møllendal	Assigned
$C_2H_4O_2(CH_2OH-CHO)$	Glycolaldehyde	H. Møllendal	Search for isotopes
$C_3H_5NS(CH_3-CH_2NCS)$	Ethylisothiocyanate	K. Solgaard	Many lines measured

36. Name of Institution **The Pennsylvania State University**

Name of Department or Institute **Chemistry**

Name to Whom Queries Should Be Addressed **L. Peter Gold**

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CH_5As (CH_3AsH_2)	methylarsine		manuscript in preparation
C_2H_7As $((CH_3)_2AsH)$	dimethylarsine		manuscript in preparation
CH_2N_4	tetrazole		normal and both deuterated species assigned; Stark effect measurements in progress.
CKN (KCN) CNNa (NaCN)	potassium cyanide sodium cyanide		work in progress

37. PRINCETON UNIVERSITY

Department of Chemistry

Professor V.W. Laurie

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
C_7H_9Cl	4-chloronortricyclene	W. Stigliani	Heavy atom structure.
$C_{10}H_{10}$	bullvalene	W. Stigliani	Intra-rearrangement study.

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
$C_5H_{10}N_2$	tert-butyl cyanamide	R. Kewley	Spectrum of normal and ND species observed
$C_4H_8O_2$	1,3-dioxane	R. Kewley	Manuscript accepted
$C_5H_{11}NO$	N-methyl morpholine	R. Kewley	Spectrum of equatorial methyl conformer assigned

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_4 C_3H_3D	Propyne, propyne-d_1	M. Bertram	Excited vibrational states assigned.
C_3HF_3	Trifluoropropyne	M. Bertram	Excited vibrational states assigned
C_2H_3N	Acetonitrile	M. Bertram	Excited vibrational states other than ν_8.
C_3H_6O	Oxetane-n, d_6, β-d_2, α-d_4, α-d_2 species.	R.A. Creswell	All species assigned in several excited states of the ring puckering mode.
$C_4H_6O_2$	3,6-dioxabicyclo [3.1.0.]hexane.	R.A. Creswell	Manuscript in preparation.
CH_3I	Methyliodide	R.L. Kuczkowski	Excited vibrational states.

Other molecules:

C_7H_6O	Tropone	R.A. Creswell	n. species assigned in several vibrational states
$C_7H_6O_2$	Tropolone	R.A. Creswell	Some lines assigned.
$C_6H_{10}O$	7-oxabicyclo [2.2.1.]heptane	R.A. Creswell	Spectrum assigned.
$C_5H_4O_2$	Cyclopent-2-en-1,4-dione	R.A. Creswell	Work in progress
F_3HSi	Trifluorosilane	A.R. Hoy	Excited vibrational states assigned, manuscript in preparation.

40. Name of Institution Rice University

Name of Department or Institute Chemistry Department

Name to Whom Queries Should Be Addressed Robert F. Curl

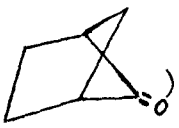
FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
$BF_2HO(BF_2OH)$	Difluorohydroxyboron	H. Takeo	In Press
$CH_6OSi(CH_3OSiH_3)$	Silyl Methyl Ether	C. Le Croix	Internal rotational analysis in progress
CSSe(SCSe)	Thiocarbonylselenide	C. Hirose	Published
$C_3ClH_3O(CH_2{=}CH{\cdot}COCl)$	Acryloyl Chloride	R. Kewley D. Hemphill	Trans conformer completed
$C_6H_5NO_3$	o-nitrophenol	S. Leavell	Normal, OD, ^{18}OH assigned
$C_6H_{10}O$	Cyclohexeneoxide	T. Ikeda R. Kewley	Assigned, dipole measured
$C_7H_6O_2$	Salicyl aldehyde	H. Jones	In Press
GeF_2	Germanium Difluoride	H. Takeo	2nd paper in press

41. Sagami Chemical Research Center
Sagamihara, Kanagawa 229, Japan

Yonezo Morino

IO	IO radical	S. Saito	Manuscript in preparation.
DNO	Nitrosyl deuteride	S. Saito	Manuscript in preparation. Cowork with Prof. K. Takagi of Toyama University.
HNO	Nitroxyl	S. Saito	Spectrum assigned. Cowork with Prof. K. Takagi.
C_3H_7F (CH_3CHFCH_3)	2-fluoropropane	N. Yoshida F. Makino	Structure determined. Manuscript in preparation.
$C_3H_3F_3$ (CF_3CHCH_2)	3,3,3-trifluoropropene	S. Saito F. Makino	Manuscript in preparation.

42. San Diego State University
Department of Chemistry
San Diego, California 92115
Dewitt Coffey, Jr.

C_6H_8O ()	bicyclo(2.1.1)hexan-5-one	Manuscript
$C_4H_6O_2$ ($O{=}C(-O-CH(-CH_3)-)-CH_2-$)	β-butyrolactone	Manuscript

43. Name of Institution: University of South Carolina

Name of Department or Institute: Department of Chemistry

Name to Whom Queries Should be Addressed: James R. Durig

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STATE OF PROGRESS
C_6H_{10}	methylene cyclopentane	Carreira	Manuscript submitted

$BH_6P(BH_3PH_3)$	phosphine borane	Carreira	Spectra assigned(16 species
$C_4H_6O_2$	γ-Bytyrolactone	Tong	Spectrum Assigned
C_2H_2O	Glyoxal	Tong	Q-branches assigned
C_5H_8O	4,5-dihydro-2-methylfuran	Carter	In Progress
$C_4H_9NOSi[(CH_3)_3SiNCO]$	trimethyl silyl isocyanate	Carter	Spectrum assigned
$C_4H_9NOSi[(CH_3)_3SiNCS]$	trimethyl silyl isothiocynate	Carter	Spectrum assigned
$C_2H_3BF_2[CH_2CHBF_2]$	vinyldifluoroborane	Carter	Spectrum assigned
$C_3H_9BrGe[(CH_3)_3GeBr]$	trimethyl bromo germane	Li	Spectrum assigned
$C_3H_{12}BN[(CH_3)_3NBH_3)$	trimethylamine borane	Durig & Li	Spectra assigned(9 species)
$C_3H_{10}Ge[(CH_3)_3GeH]$	trimethyl germane	Chen	Spectrum assigned
$C_5H_9NO[(CH_3)_3CNCO]$	trimethyl isocyanate	Thompson	Spectrum assigned
$C_4H_9NSi[(CH_3)_3SiCN]$	trimethyl silyl cyanide	Carter	Spectrum assigned
$C_4H_9NSi[(CH_3)_3SiNC]$	trimethyl silyl isocyanide	Carter	Spectrum assigned
$C_2H_{10}BN[(CH_3)_2HNBH_3]$	dimethyl amine borane	Hudgens	In progress
$C_2H_{10}BP[(CH_3)_2HPBH_3]$	dimethyl phosphine borane	Hudgens	In progress

44. **Name of Institution** University of Southern California

Name of Department or Institute Chemistry Dept.

Name to Whom Queries Should Be Addressed Robert A. Beaudet

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CB_5H_7	Carba-hexaborane(7)	G. McKown R. Beaudet	^{13}C in preparatio
$C_4B_2H_6$	Tetracarban hexaborane(6)	J. Pasinski	^{13}C species assigned
$C_2B_3H_7$	Dicarbapentaborane(7)	L. Li	^{13}C prepared
SiF_3SiH_3	1,1,1, trifluoro disilone	J. Pasinski	manuscript in preparation

45. UNIVERSITY OF SUSSEX

SCHOOL OF MOLECULAR SCIENCES

BRIGHTON, U.K.

H. W. KROTO

CH_3NSi (SiH_3CN)	Silyl Cyanide	A.J. Careless	Excited vib. states assigned.
CH_3GeN (GeH_3CN)	Germyl Cyanide	A.J. Careless	1 doublets studied
C_4H_9NOSi ($(CH_3)_3SiNCO$)	Trimethyl Silyl isocyanate	A.J. Careless	Excited vib. states
C_4H_9NSSi ($(CH_3)_3SiNCS$)	Trimethyl silyl isothiocyanate	A.J. Careless	Excited vib. states
$C_3H_9N_3Si$ ($(CH_3)_3SiN_3$)	Trimethyl silyl azide	B. Landsberg	Spectrum assigned
CF_5P (CF_3PF_2)	Trifluoromethyl fluoro Phosphine	B. Landsberg	Spectrum obtained

46. SWISS FEDERAL INSTITUTE OF TECHNOLOGY

Laboratory for Physical Chemistry

Zurich , Switzerland

Hs. H. Günthard / A. Bauder

C_3H_7N	N-Methylethylidenimine	W. Bossert	Manuscript in press (J. Chem. Phys.), isotopic species in progress
C_6H_6C (C_6H_5OD)	Deutero phenol	E. Mathier	First torsionally excited state
$C_{10}H_8$	Azulene	P. Christen	Manuscript in press (J. Mol. Spectry.)
$C_2H_3NO_2$	Nitroethylene	P. Nösberger	Isotopic species

47. Name of Institution Texas Tech University

Name of Department or Institute Physics Department

Name to Whom Queries Should Be Addressed C. R. Quade

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
CH_2DOH CHD_2OH CH_2DOD CHD_2OD	Methyl alcohol (isotopes)	H. Test	Well underway
CH_2DSH CHD_2SH	Methyl mercaptan (isotopes)	H. Test P. Seibt	Well underway
N_3OCOCH_3 N_3OCOCD_3 $N^{15}N_2OCOCH_3$	Methyl azidoformate (isotopes)	R. Kakar	Ground and one excited vibrational state in each speci assigned
C_2H_5OH CH_2DCH_2OH	Ethyl alcohol (isotopes)	R. Kakar P. Seibt	a and c-dipole gauc lines assigned

48. Name of Institution: University of Texas at Austin

Name of Department or Institute: Department of Chemistry

Name to Whom Queries Should Be Addressed: J. E. Boggs

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$C_4H_5N(CH_2\text{-}CH_2\text{-}CH\text{-}CN)$	Cycloproplcyanide	R. Penn	Isotopic species assigned
$C_4H_8O(CH_2\text{-}CH_2\text{-}CH\text{-}O\text{-}CH_3)$	Cyclopropyl methyl ether	R. Penn	Gauche conformer, methyl torsion
$C_3H_9N((CH_3)_2CHNH_2)$	Isopropyl amine	L. Griffin	Symmetric conformer
$C_3H_8S((CH_3)_2CHSH)$	Isopropyl mercaptan	J. Griffiths	Manuscript in preparation
$C_3H_5NO_2(CH_2\text{-}CH_2\text{-}CH\text{-}NO_2)$	Nitrocyclopropane	A. Mochel	In press

$C_5H_8((CH_3)_2CH\text{-}C\equiv CH)$	Isopropylacetylene	A. Mochel	Normal and deuterated species
$C_5H_6(CH_2\text{-}CH_2\text{-}CH\text{-}C\equiv CH)$	Cyclopropylacetylene	M. Collins	In press
$C_4H_4O(O\text{-}CH_2\text{-}CH\text{-}C\equiv CH)$	Epoxybutyne	M. Collins	In press
$C_3H_9N(CH_3CH_2NHCH_3)$	Methylaminoethane	R. Penn	Near planar conformer, inversion effects

49. Name of Institution Tokyo Institute of Technology

Name of Department or Institute Laboratory of Molecular Spectroscopy

Name to Whom Queries Should Be Adressed Kunio Kozima

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OR PROGRESS
C_2H_4O ($CH_2\text{-}CH_2$, O)	Ethylene oxide	C. Hirose	r_s-structure manuscript in preparation
C_2H_4O ($CH_2\text{-}CH_2$, O)	Ethylene oxide	N. Yoshimizu	Q-branch for a vib'l. state assigned
CSSe (SCSe)	Thiocarbonyl selenide	C. Hirose	J.Chem.Phys., 55, 5120
C_4H_6O ($(CH_2CH)_2O$)	Divinyl ether	C. Hirose	Q-branch for several vib'l. states assigned (cis-trans isomer)
C_6H_5NO	2-Pyridine allehyde	Y. Kawashima	Spectrum assigned for trans isomer
CD_3I	Methyl iodide	K. Okiye	Dbl. resonance in progress
C_5H_6S	3-Methyl-thiophene	T. Ogata	In press J. Mol. Spectrosc.
$C_3H_5NO_2$	2-Nitropropene	K. Tochigi	Spectrum assigned. Vib'l. states in progress

C_7H_5OF	o-Fluoro-benzaldehyde	N. Yoshimizu	Spectrum observed. Analysis in progress

50. GOVERNMENT CHEMICAL INDUSTRIAL RESEARCH INSTITUTE, TOKYO
2nd Division
Honmachi-1, Shibuya-ku, Tokyo
Chi Matsumura

$C_3D_2H_2$	Allene 1,1-d_2	Matsumura	Spectrum assigned
$C_2H_4Cl_2$	1,2-Dichloroethane	Matsumura	Isotopic species
Cl_3OV ($VOCl_3$)	Trichlorooxo vanadium	Karakida	Paper submitted
F_3Sb (SbF_3)	Antimony trifluoride	Takeo	Excited states

51. Toyama University
Gofuku, Toyama 930, Japan

Takeshi Kojima

DNO	Nitrosyl deuteride	K. Takagi	Manuscript in preparation. Cowork with Dr. S. Saito of Sagami Chemical Research Center
HNO	Nitroxyl	K. Takagi	Spectrum assigned Cowork with Dr. S. Saito
CH_5N(CH_3NHD)	Methyl amine	K. Takagi T. Kojima	Manuscript in preparation
H_3NO(NH_2OH)	Hydroxyl amine	S. Tsunekawa	In press.

52. Name of Institution University Ulm D 75 Karlsruhe 21

Name of Department or Institute Department of Physical Chemistry Hertzstr. 16 Bau 351

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

FORMULA*	NAME OF COMPOUND	NAME OF INVESTIGATOR**	PRESENT STAGE OF PROGRESS
C_3H_2Cl ($ClCH_2$-C≡C-Cl)	1,3-tri chloro propin	H. Günther	some isotopic species assigned
C_2HD_6SiCl $[(CD_3)_2SiHCl]$	Dimethyl chloro silane	B. Haas, R. Gegenheimer	work in progress
C_2D_7SiCl $[(CD_3)_2SiDCl]$	"	"	"
$C_2H_2D_5SiCl$ $[CD_3CD_2HSiHCl]$	"	"	"
C_2H_7SiCl	($C_2H_5SiH_2Cl$) Ethyl chloro silane	V. Typke	trans- and gauche form assigned
CSFCl	(S=CFCl)	H. Kohrmann	work completed

53. Name of Institution *Virginia Polytechnic Institute and State University*

Name of Department or Institute *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)	*Bromoacetonitrile*	*M. Gum*	*Spectra of ^{79}Br and ^{81}Br species assigned. Second order NQR study in progress*
CrF_2O_2	*Chromyl fluoride*	*C. Shoemaker*	*Spectrum partly assigned.*

54. University of Wisconsin, Madison
Department of Chemistry
Madison, Wisconsin 53706

R. Claude Woods

$C_4H_{10}O$	$(C(CH_3)_3OH)$	t-butyl alcohol	E. Valenzuela	In progress
$C_2H_4O_2$	(CH_2OHCHO)	glycolaldehyde	T. Dixon	In progress

55. Name of Institution Universität Frankfurt am Main

Name of Department or Institute Institut für Physikalische Chemie

Name to Whom Queries Should be Addressed Prof. Dr. H. Hartmann

FORMULA	NAME OF COMPOUND	NAME OF INVESTIGATOR	PRESENT STAGE OF PROGRESS
$(HF)_n$	Hydrogen fluoride	Udo V. Reichert	Spectrum assigne for hexamers and heptamers at low pressures and temperatures.

FORMULA INDEX

AlBr - Aluminum bromide - 3

AlI - Aluminum iodide - 3

AsF_3 - Arsenic Trifluoride - 16

BaO - Barium oxide - 3,6

BF_2HO (BF_2OH) - Difluorohydroxyboron - 40

BH_6P (BH_3PH_3) - Phosphine borane - 43

BrCs (CsBr) - Cesium bromide - 3

$BrGeH_3$ (GeH_3Br) - Germyl bromide - 22

BrO - Bromine monoxide - 16

BrTl (TlBr) - Thallium bromide - 3

CHNO - Fulminic acid - 15

CHNS (HNCS) - Isothiocyanic acid - 15

CH_2F_2 - Difluoro methane - 16, 23

CH_2N_2 - Diazomethane - 8

CH_2N_2 (NH_2CN) - Cyanamide - 11

CH_2N_4 - Tetrazole - 36

CH_2O (HCHO) - Formaldehyde - 9, 18

CH_2O_2 (HCOOH) - Formic acid - 18

CH_3Cl, CD_3Cl - Methyl chloride - 23, 16

CH_3ClS - Methane sulfenyl-chloride - 15

CH_3F - Methyl fluoride - 16

CH_3F_2OP (CH_3OPF_2) - Methoxydifluorophosphine - 26

CH_3F_2P (CH_3PF_2) - Methyldifluorophosphine - 26

CH_3GeN (GeH_3CN) - Germyl cyanide - 45

CH_3I - Methyl Iodide - 9, 49, 39

CH_3N (CH_2NH) - Methyleneimine - 31

CH_3NO - Nitrosomethane - 5

CH_3NO ($CHONH_2$) - Formamide - 16, 31, 8

CH_3NO_2 - Nitro-methane - 5, 18

CH_3NO_3 - Methyl nitrate - 5

CH_3NS ($CHSNH_2$) - Thioformamide - 16

CH_3NSi (SiH_3CN) - Silyl cyanide - 45

CH_4ClN ($N(CH_3)HCl$) - Mono-chloro-methylamine - 4

CH_4O - Methyl alcohol - 32, 47

CH_4S - Methyl mercaptan (isotopes) - 47

CH_5As (CH_3AsH_2) - Methylarsine - 36

CH_5N (CH_3NHD) - Methyl amine - 51

CH_5NO (CH_3ONH_2) - Methoxyamine - 14

CH_6BF_2P ($CH_3PF_2BH_3$) - Methyldifluoro-phosphine-BH_3 - 26

CH_6OSi (CH_3OSiH_3) - Silyl methyl ether - 40

CH_6Si (CH_3SiH_3) - Methyl silane - 16

CH_7B_5 - Carba-hexaborane (7) - 44

CH_8BP ($CH_3PH_2BH_3$) - Methylphosphine borane - 27

CClFO - Carbonyl fluorochloride - 15

CClFS - 52

CFN (FCN) -Cyanogenfluoride - 31, 11

CF_2NP (PF_2CN) - Cyanodifluorophosphine - 2(

CF_2N_2 (NF_2CN) - Difluorocyanamide - 26, 11

CF_2O (F_2CO) - Carbonyl fluoride - 33

CF_3NO - Trifluoronitrosomethane - 33

$CF_4O(CF_3OF)$ - Trifluoromethylhypofluorite - 17

CF_5P (CF_3PF_2) - Trifluoromethyl fluoro phosphine - 45

CKN (KCN) - Potassium cyanide - 36

CNNa (NaCN) - Sodium cyanide - 36

CNO (NCO) - 16

CN_4 (NCN_3) - Cyanogen azide - 29

COS (OCS) - Carbonyl sulphide - 9

CSSe (SCSe) - Thiocarbonyl selenide - 49

C_2HI - Iodoacetylene - 33

C_2H_2BrN (CH_2BrCN) - Bromoacetonitrile - 53

$C_2H_2N_2O$ - 1,3,4-oxadiazole - 8

$C_2H_2N_2O$ - 2,4-oxadiazole - 2

$C_2H_2N_2S$ - 2,4-thiadiazole - 2

$C_2H_2N_2Se$ - Selenadiazole - 29

C_2H_2O - Glyoxal - 43

$C_2H_2O_3$(CHO-COOH) - Glyoxylic acid - 35

$C_2H_3BF_2[CH_2CHBF_2]$ - Vinyldifluoroborane - 43

C_2H_3Br - Vinyl bromide - 21

C_2H_3ClO (CH_2ClCHO) - Chloroacetaldehyde - 25

$C_2H_3ClO_2$ - Methyl chloroformate - 2

$C_2H_3N(CH_3CN)$ - Methyl cyanide - 9, 39

C_2H_3N (CH_3NC) - Methyl isocyanide - 18, 23

C_2H_3NO - Glycollonitrile - 4

$C_2H_3NO_2$ - Nitroethylene - 46

$C_2H_3NO_2(HN(CHO)_2)$ - Diformamide - 12

C_2H_3NS - Methyl rhodanate - 10, 15

$C_2H_3N_3$ - 1,2,3-triazole - 8

$C_2H_3N_3$ - 1,2,4-triazole - 29

$C_2H_3N_3O_2$ (N_3OCOCH_3)
Methyl azidoformate (isotopes) - 47

C_2H_4ClF - 1,1-fluorochloroethane - 7

C_2H_4ClN - 1-Chloro-aziridine - 8

$C_2H_4Cl_2$ - 1,2-dichloroethane - 50

$C_2H_4N_2$ - Amino acetonitrile - 12

C_2H_4O - Ethylene oxide - 49

$C_2H_4O_2$ - Acetic acid - 22, 24

$C_2H_4O_2(CH_2OHCHO)$ - Glycolaldehyde - 35, 5

$C_2H_4O_2$ - Peroxirane - 29

$C_2H_4O_2S$ - Ethylene sulfone - 28

$C_2H_4O_3$ $(CH_2OHCOOH)$ - Glycolic acid - 13

$C_2H_4O_3(H_2\overline{COOCH_2O})$ - 1,2,4-trioxacyclopentane - 27

$C_2H_4S_2$ $(CH_2(SH)_2)$ - Dithio methane - 17

C_2H_5N - Aziridine (ethylenimine) - 8

$C_2H_5NO_3$ - Ethyl nitrate - 12

$C_2H_6F_2NP$ - Dimethylamino-difluorophosphine - 4

C_2H_6O - Ethyl alcohol (isotopes) - 21, 47

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

$C_2H_6O_2(DOCH_2-CH_2OD)$ - d_2-Ethyleneglycol - 35

C_2H_6S CH_3-S-CH_3 - Dimethyl sulfide - 10, 15

C_2H_7As $((CH_3)_2AsH)$ - Dimethylarsine - 36

$C_2H_7B_3$ - Dicarbapentaborane(7) - 44

C_2H_7ClSi - Ethyl chloro silane - 52

C_2H_7ClSi - Dimethyl chloro silane - 52

$C_2H_{10}BN[(CH_3)_2HPBH_3]$ - Dimethyl amine borane - 43

$C_2H_{10}BP[(CH_3)_2HPBH_3]$ - Dimethyl phosphine borane - 43

C_3HF_3 - Trifluoropropyne - 39

$C_3H_2Cl_2(ClCH_2-C\equiv C-Cl)$ - 1,3-di chloro propyne- 52

$C_3H_3Br(CH_2=C=CHBr)$- Bromoallene - 30

$C_3H_3C\ell(CH_2=C=CHC\ell)$ - Chloroallene - 30

C_3H_3ClO - Acryloyl chloride - 40

C_3H_3F $(CH_2=C=CHF)$- Fluoroallene - 30

$C_3H_3F_3(CF_3CHCH_2)$ - 3,3,3-trifluoropropene - 41

$C_3H_3F_3O_2(CF_3COOCH_3)$ - Methyl trifluoroacetate - 2

C_3H_4 - Allene 1,1-d_2 - 16, 50

C_3H_4 - Propyne, Propyne-d_1 - 39

C_3H_4ClN $(ClCH_2CH_2CN)$ - 3-chloropropionitrile - 12

$C_3H_4F_2$ - 2,3 difluoropropene - 6

$C_3H_4N_2$ - Imidazole - 2

$C_3H_4N_2$ - Pyrazole - 8

C_3H_4O - Propargyl alcohol - 4

$C_3H_4O_2(CH_2OCHCHO)$ - Glycidaldehyde - 26

C_3H_4S - Propargyl mercaptan - 2, 15

C_3H_5ClO - Epichlorohydrin - 28

C_3H_5FO - Epifluorohydrin - 28

C_3H_5FO - Propionyl fluoride - 2

C_3H_5N (CH_3-CH_2-CN)- Propionitrile - 15

$C_3H_5NO(CH_3CH_2NCO)$ - Ethylisocyanate - 35

$C_3H_5NO_2$ - 2-Nitropropene - 49

$C_3H_5NO_2(CH_2-CH_2-CH-NO_2)$ - Nitrocyclopropane - 48

$C_3H_5NS(CH_3CH_2SCN)$ - Ethylthiocyanate- 35

C_3H_6O - Cyclopropanol - 2

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

C_3H_6O - Propanal - 12

$C_3H_6O_2$ - Glycidol - 32

$C_3H_6O_2$ - Propionic acid - 2

$C_3H_6O_2$ (CH_3COCH_2OH) - Acetol (2-propanone-1-hydroxyl) - 17

$C_3H_6O_3(CH_2OHCOOCH_3)$ - Methyl glycolate - 1

$C_3H_6O_3(H_2CO)_3$ - Trioxane - 18

C_3H_7ClO - 1-chloro-3-hydroxypropane - 12

C_3H_7F (CH_3CHFCH_3) - 2-fluoropropane - 41

C_3H_7N - N-Methylethylidenimine - 46

C_3H_7N $(CH_2=CHCH_2NH_2)$ - Allylamine - 30, 10

C_3H_7NO $(HCON(CH_3)_2)$ - Dimethylformamide - 26

C_3H_8O $[(CH_3)_2CHOH]$ - Isopropanol - 16

C_3H_8S - Isopropyl mercaptan - 2, 48

$C_3H_9BrGe[(CH_3)_3GeBr]$ - Trimethyl bromo germane - 43

C_3H_9N $(CH_3CH_2CH_2NH_2)$ - n-Propylamine - 32

$C_3H_9N(CH_3CH_2NHCH_3)$ - Methylaminoethane - 48

$C_3H_9N((CH_3)_2CHNH_2)$ - Isopropyl amine - 48

$C_3H_9N_3Si((CH_3)_3SiN_3)$ - Trimethyl silyl azide - 45

$C_3H_{10}Ge[(CH_3)_3GeH]$ - trimethyl germane - 43

$C_3H_{12}BN[(CH_3)_3NBH_3)$ - Trimethylamine borane - 43

$C_3H_{12}BP((CH_3)_3PBH_3)$ - Trimethylphosphine borane - 27

$C_3BrN(BrCCCN)$ - Bromocyanoacetylene - 35

$C_3ClF_3(CF_3CCCl)$ - Trifluoromethylchloroacetylene - 35

$C_3ClN(ClCCCN)$ - Chlorocyanoacetylene - 35

$C_3F_4(CF_3CCF)$ - Perfluoropropyne - 2

$C_3IN(ICCCN)$ - Iodocyanoacetylene - 35

$C_4H_2N_2(NC\text{-}CH{=}CH\text{-}CN)$ - Maleonitrile- 8

C_4H_3N $(CH_2{=}C{=}CHCN)$ - Cyanoallene - 30

$C_4H_4Cl_2$ - Dichloromethylenecyclopropane - 24

$C_4H_4O(O\text{-}CH_2\text{-}CH\text{-}C{\equiv}CH)$ - Epoxybutyne - 48

C_4H_4O - 2,5-dideuterofuran - 15

$C_4H_4O_2(HCOOCH_2CCH)$ - Propargyl formate -2

$C_4H_4O_2(O\text{-}CH_2\text{-}CH{=}CH\text{-}CO)$ - γ-Crotonolactone - 19

$C_4H_4N_2$ - Pyrimidine - 29

C_4H_4Se - Selenophene - 15

C_4H_4Te - Tellurophene - 29

C_4H_5N - Allyl iso-cyanide - 32

$C_4H_5N(CH_2\text{-}CH_2\text{-}CH\text{-}CN)$ - Cyclopropyl cyanide - 48

C_4H_5NO - 5 methyl isoxazole - 2

C_4H_5NS - 3-methyl-iso-thiazole - 2

$C_4H_5NS(CH_2{=}CHCH_2NCS)$ - Allyl isothiocyanate - 30

$C_4H_6B_2$ - Tetracarban hexaborane(6) - 44

$C_4H_6N_2$ - N-methyl imidazole - 2

C_4H_6O $((CH_2CH)_2O)$ - Divinyl ether - 49

C_4H_6O $((CH_3)_2CCO)$ - Dimethylketene - 10, 15

C_4H_6O - Oxaspiropentane - 2

$C_4H_6O_2$ - γ-Butyrolactone - 19, 43

$C_4H_6O_2$ - Cyclopropyl carboxylic acid - 2

$C_4H_6O_2$ - 3,6-dioxabicyclo [3.1.0.] hexane - 31,39

$C_4H_6O_2(O{=}C\text{-}O\text{-}CH\text{-}CH_3)$ - β-butyrolactone - 42
(CH_2)

$C_4H_7Cl(CH_2C(CH_3)CH_2Cl)$ - iso-butenyl chloride - 12

C_4H_7Cl - Cyclopropylcarbinyl chloride - 28

C_4H_7FO - Isobutyryl fluoride - 2

C_4H_7N - n-propyl- isonitrile - 12

C_4H_7NO $(CH_2\text{-}(CH_2)_2\text{-}NH\text{-}CO)$ - Pyrrolidone - 19

C_4H_8O - Isobutyraldehyde - 2

C_4H_8O - Cyclopropyl carbinol - 32

$C_4H_8O(CH_2\text{-}CH_2\text{-}CH\text{-}O\text{-}CH_3)$ - Cyclopropyl methyl ether - 48

C_4H_8O $(CH_3CH_2CH_2CHO)$ - n-Butyraldehyde - 26

C_4H_8OS - Thioxane - 31

$C_4H_8O_2$ - Isobutyric acid - 2

$C_4H_8O_2$ $(CH_2CH_2OCH_2OCH_2)$ - 1,3-dioxane - 20

$C_4H_9NOSi[(CH_3)_3SiNCO]$ - Trimethyl silyl isocyanate - 43, 45

$C_4H_9NSSi[(CH_3)_3SiNCS]$ - Trimethyl silyl isothiocyanate - 43,4

$C_4H_9NSi[(CH_3)_3SiCN]$ - Trimethyl silyl cyanide - 43

$C_4H_9NSi[(CH_3)_3SiNC]$ - Trimethyl silyl isocyanide - 43

$C_4H_{10}O$ ($C(CH_3)_3OH$) - t-butyl alcohol - 54

$C_4H_{11}P[(CH_3)_3P{=}CH_2]$ - Trimethyl methylene phosphorane - 6

$C_5H_4(CH{\equiv}C\text{-}CH_2\text{-}C{\equiv}CH)$ - 1,4-pentadiyne - 27

C_5H_4BrN - 2-Bromopyridine, 4-Bromopyridine - 4

C_5H_4ClN - 2-chloropyridine - 15, 29

C_5H_4FN - 2-Fluoropyridine - 15

$C_5H_4O_2$ - Cyclopent-2-en-1,4-dione - 39

C_5H_5As - Arsabenzene - 27

C_5H_5BeCl(C_5H_5BeCl) - Cyclopentadienylberyllium chloride - 35

C_5H_5In - Cyclopentadienyl indium - 5

C_5H_5N - Pyridine - 8, 15

C_5H_5NNiO (C_5H_5NiNO) - Cyclopentadienyl nitrosyl nickel - 5

C_5H_5NO - Pyridine N-oxide - 8

C_5H_5PtNO (C_5H_5NOPt) - Cyclopentadienyl nitrosyl platinum - 5

C_5H_5P - Phosphabenzene - 27

C_5H_5Tl - Cyclopentadienyl thallium - 5

$C_5H_6(\underline{CH_2\text{-}CH_2}\text{-}CH\text{-}C{\equiv}CH)$ - Cyclopropylacetylene- 48

$C_5H_6(CH_3CHCHCCH)$ - <u>trans</u> 3-penten-1-yne - 25

C_5H_6O ($\underline{CH_2\text{-}CH_2}\text{-}CH{=}CH\text{-}CO$) - Cyclopent-2-en-1-one - 19

C_5H_6O ($\underline{CH_2\text{-}CH_2}{=}CH\text{-}\underline{CH_2\text{-}CO}$) - Cyclopent-3-en-1-one - 19

C_5H_6S - 3-methyl-thiophene - 49

$C_5H_7N(C_4H_7CN)$ - Cyclobutylcyanide - 14

C_5H_8 - Bicyclo[2.1.0.] pentane - 14

C_5H_8 [$CH_2{=}CHCH_2CH{=}CH_2$] - 1,4-pentadiene - 16

$C_5H_8(\underline{CH_2CH_2}CHCHCH_2)$ - Vinylcyclopropane - 26

$C_5H_8((CH_3)_2CH\text{-}C{\equiv}CH)$ - Isopropylacetylene - 48

$C_5H_8((CH_3)_2CCCH_2)$ - Dimethylallene - 10

C_5H_8O - 4,5-dihydro-2-methylfuran - 43

C_5H_8O ($\underline{CH_2CH_2}CHCOCH_3$) - Cyclopropyl methketone - 26

C_5H_9N O ($(CH_3)_3CCNO$) - Pivalo-nitile-oxi 1

$C_5H_9NO[(CH_3)_3CNCO]$ - Trimethyl isocyanate - 43

$C_5H_9O_3P$ - 1-methyl 4 phospha 3,5,8 trioxabicyclo[222] octane - 19

$C_5H_{10}O$ ($(CH_3)_3CCHO$) - Pivaldehyde - 15

$C_5H_{10}S$ - Pentamethylene sulfide - 31

$C_5H_{11}N$ - Piperidine - 19

C_6H_4BrF ($m\text{-}C_6H_4FBr$) - m-fluoro-bromobenzene - 1

C_6H_4BrF ($O\text{-}C_6H_4FBr$) - O-fluoro-bromobenzene - 1

$C_6H_4Cl_2$ - o amd m-dichlorobenzene - 29

C_6H_5BrO - 4-bromo-phenol - 8

C_6H_5ClO - 4-chloro-phenol - 8

C_6H_5FO - 4-fluoro-phenol - 8

C_6H_5NO - 2-Pyridine aldehyde - 49

$C_6H_5NO_2$ -Nitrobenzene - 8

$C_6H_5NO_3$ - o-nitrophenol - 40

C_6H_6FN - Meta-fluoro-aniline - 4

C_6H_6FN ($F\ C_6H_4NH_2$) - Parafluoro-aniline - 11

C_6H_6O - Phenol, Phenol-OD, Phenol-^{13}C - 8

C_6H_6O (C_6H_5OD) - Deutero phenol - 46

C_6H_6S - Thiophenol - 8

C_6H_7N - aniline - 8

C_6H_8O - Bicyclo(2.1.1)hexan-5-one - 42

FNO - Nitrosyl fluoride - 15

FS - Sulfur monofluoride - 16

FTl (TlF)- Thallium fluoride - 3

F_2Ge (GeF_2)- Germanium difluoride - 40

F_2N (NF_2)- Nitrogen (II) fluoride - 29

F_2OS (F_2SO)- Thionyl fluoride - 18, 33

F_2Si (SiF_2) - Silicon difluoride - 16

F_3HSi - Trifluorosilane - 39

$F_3H_3Si_2$ (SiF_3SiH_3)- 1,1,1, trifluoro disilane - 44

F_3Sb (SbF_3) - Antimony trifluoride - 50

GeH_3I - Germyl iodide - 22

GeTe - Germanium telluride - 3

HNO - Nitroxyl - 41

HNO_2 - Nitrous acid - 5

HO - OH radical - 6

$H_2{}^{16}O$ - Water and isotopes - 18, 21

H_3N (NH_3) - Ammonia - 23

H_3NO(NH_2OH) - Hydroxyl amine - 51

H_4N_2 N_2D_4 - Hydrazine-d_4 - 14

H_9PSi_3[$(SiH_3)_3P$] - Silylphosphine - 34

IK (KI) - Potassium iodide - 3

IO - IO radical - 41

I Tl (Tl I) - Thallium iodide - 3

NP (PN) - Phosphorous nitride - 3

NS - NS radical - 18

N_2O_3 - Dinitrogen trioxide - 5, 26

OS - SO radical - 18

O_2 - Oxygen - 16

O_2S ($^{16}O^{32}S^{16}O$)- Sulfur dioxide - 21

O_3 - Ozone - 18

SSi (SiS) - Silicon sulfide - 3

SSn(SnS)- Tin Sulfide - 3