

D. Johnson - p. 1  
Jackson - p. 12  
return

Joseph B. Lambert

Illinois  
Institute of  
Technology  
N-M-R  
Newsletter

No. 104  
MAY, 1967

Brouwer, Mackor NMR Spectra of Protonated Ketones (Dialkylhydroxycarbonium Ions)	1
Richards Dynamic Nuclear Polarisation in Phosphorus compounds	2
Kim, Anderson, J. M. The NMR Spectrum of 1,5-Dimethylnaphthalene; or A Deceptively Complicated Poor Girl's Decoupled Spectrum	3
King Uses for a Frequency Synthesizer, I	6
Wisnosky, Kostelnik A Program Yclept CYCLIST	7
Reeves $^{19}\text{F}$ NMR of Fluoroberyllate Ions in Solution	10
Johnson, F. A. $\text{Fl}^9$ and $\text{P}^{31}$ NMR of $\text{P}_2\text{F}_4$	12
Homer, Calaghan C-C and C-H Bond Diamagnetic Anisotropies	14
Morton, Fulmor An Example of Long-range Coupling Across Four Single Bonds	16
Barney, Lancaster Variation of the V3521 Modulation Frequency	17
Jensen Magnetic Non-equivalence/equivalence in Methylene Groups	18
Gutowsky Spin-Echo Studies of Internal Rotation in $\text{CF}_2\text{BrCCl}_2\text{Br}$	19
Spassov Rotational Isomerism in $\alpha$ -Oximino-Esters	20
Read, Goldstein Adaptation of LAOCOON-II for the IBM-1620 Computer	22
Fraenkel, Tokuhiro $^1\text{H}$ and $^{13}\text{C}$ Shifts in Pyridine	24
Kaufman Modification of the Varian HA-60-EL Proton Stabilizer for Use with Other Nuclei	26
Levenberg A Vernier Control for the HP 200AB Audio Oscillator	29
Lustig Position Available in Instrumentation Section; Fourier Transform Spectrometry	30

O V E R

PLEASE NOTE DATES!!!!

Deadline Dates: No. 105 - 10 June 1967  
No. 106 - 10 July 1967

A monthly collection of informal private letters from laboratories of NMR. Information contained herein is solely for the use of the reader. Quotation is not permitted, except by direct arrangement with the author of the letter, and the material quoted must be referred to as a "Private Communication".

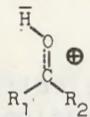
## Koninklijke/Shell-Laboratorium, Amsterdam

BADHUISWEG 3 AMSTERDAM - N.  
TELEFOON (020) - 61111

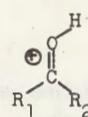
Dear Dr. Shapiro,

NMR spectra of protonated ketones (dialkylhydroxycarbonium ions)

The existence of an appreciable barrier to rotation about the partially double C-O bond in hydroxy- or alkoxycarbonium ions has recently gained increasing interest<sup>1-5</sup>. The expectation that in protonated ketones the barrier must be high enough to render the two isomeric forms I and II



(I)



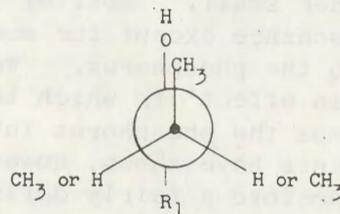
(II)

observable by NMR has been borne out by the spectra (60 and 100 Mc) of a series of eight of these carbonium ions in HF.SbF<sub>5</sub> at -20 °C. Unsymmetric ketones ( $R_1 \neq R_2$ ) give two spectra, one for each isomer, the relative intensities of which vary with the combination of  $R_1$  and  $R_2$ . (The isomer ratio varies from about one for ethyl isopropylketone to about 15 for methyl tert-butylketone.) Symmetric ketones ( $R_1 = R_2 = CH_3$ , or  $C_2H_5$ ) give spectra that show the methyl or ethyl groups to be magnetically non-equivalent.

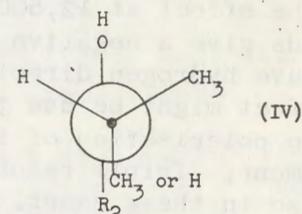
The shielding of the OH hydrogen appears to depend exclusively on the alkyl group syn to the OH hydrogen ( $R_1$  in I,  $R_2$  in II); it increases from -14.7 ppm for  $R$  = methyl to -14.4 for  $R$  = ethyl, isopropyl, or neopentyl to -14.1 for  $R$  = tert-butyl. The shielding was found to be independent of the anti alkyl group. We believe the influence of the alkyl groups on the OH shieldings to be due mainly to steric effects on the solvation of the OH group. The shielding of hydrogens bonded to  $C_{\alpha}$  (the carbon attached to the carbonyl C) is greater by 0.05-0.11 ppm for alkyl groups anti to the OH hydrogen, whereas that for  $\beta$ -CH<sub>3</sub> hydrogens is greater for syn alkyl groups by about 0.12 ppm (for  $R = C_2H_5$ ) to about 0.04 ppm (for  $R = 1-C_3H_7$ ,  $t-C_4H_9$ ).

There is a weak long-range coupling between the  $\alpha$ -hydrogens of the two alkyl groups  $R_1$  and  $R_2$  ranging from 0.7 c/s in methyl-isopropyl to 1.8 c/s in methyl-ethyl hydroxycarbonium ion.

Various spectroscopic features point to the existence of preferred conformations about the OC-C<sub>α</sub> bonds. For anti ethyl, isopropyl, and tert-butyl groups the most stable rotamer is probably that with  $\beta$ CH<sub>3</sub> eclipsing the OH group (III), as found with unprotonated<sup>6</sup> and protonated<sup>4</sup> aldehydes. For syn alkyl groups the preferred rotamers are concluded to be as shown



(III)



(IV)

in IV for  $R_1$  = ethyl or isopropyl, and similar to IV with three  $\beta$ CH<sub>3</sub> groups for  $R_1$  = tert-butyl.

Finally it is of interest to note that the existence of two distinct isomers of protonated acetaldehyde, as indicated in a recent paper by Hogeveen<sup>4</sup>, has been conclusively established. The spectrum at -20 °C in HF.SbF<sub>5</sub>, which appears to be entirely free from impurity peaks, shows not only two OH doublets but also two CH<sub>3</sub> doublets (each pair with an intensity ratio of 4:1) and two overlapping doublets of quartets for the CH resonance.

With kind regards,

D.M. Brouwer

E.L. Mackor

Amsterdam, 8th March 1967

1. D.M. Brouwer, C. Maclean, and E.L. Mackor, Rec. trav. chim., 85, 114 (1966)
2. B.G. Ramsey and R.W. Taft, J. Am. Chem. Soc. 88, 3058 (1966)
3. H. Hogeveen, A.F. Bickel, C.W. Hilbers, E.L. Mackor, and C. MacLean, Chem. Comm. 1966, 898
4. H. Hogeveen, Rec. trav. chim., 86 (1967) in press
5. Th.H. Sekuur and P. Kranenburg, Tetrahedron letters, 39, 4793 (1966)
6. G. Karabatsos and N. Hsi, J. Am. Chem. Soc. 87, 2864 (1965)

Dr. Lee's Professor of Chemistry:

R. E. Richards F.R.S.

Tel: Oxford 57757

STD Code OOX2

**PHYSICAL CHEMISTRY LABORATORY,  
SOUTH PARKS ROAD,  
OXFORD.**

14 April 1967

Professor Bernard L. Shapiro,  
Department of Chemistry,  
Illinois Institute of Technology,  
Chicago, Illinois 60616,  
U. S. A.

Dear Barry,

We are at the present time extending our nuclear electron double resonance measurements to carbon-13 and phosphorus-31 nuclear resonances. The carbon-13 resonances are sometimes enhanced and sometimes reversed but in many compounds we are able to observe quite strong signals at 3300 gauss. We have just added a noise decoupler to this machine and are obtaining sharper and stronger carbon resonances from it. We are very interested in the mechanism by which the unpaired spin density is transferred from the radical to the carbon nucleus in the compounds for which the resonance is enhanced, and for the reason for the lack of this transfer in the compounds for which the resonances are inverted. It is too early yet to be able to give a definite answer to this question.

Some of the results on phosphorus resonances are however rather more clear. Measurements of thirteen organic compounds containing phosphorus in an oxidation state of five, and seven compounds with phosphorus in an oxidation state of three have been studied at both 3300 gauss and 12,500 gauss. Very strong enhancements of the phosphorus resonance are observed in all the trivalent phosphorus compounds except diethoxy chloro-phosphine where the effect at 12,500 gauss is rather small. Most of the trivalent compounds give a negative phosphorus resonance except for some compounds which have hydrogen directly attached to the phosphorus. We thought that this effect might be due to a 'three spin effect' in which the strong negative polarisation of the protons pumps the phosphorus into a positive enhancement. Triple resonance measurements have shown, however, that this is not so in these cases. There is therefore a fairly definite correlation between the nuclear polarisation in these experiments and the valence state of the phosphorus.

The mechanism by which the spin density is transferred from the radical to the phosphorus nucleus is too complex to treat quantitatively at this stage, but Peter Atkins and Raymond Dwek have been able to show qualitatively that one would expect a much more effective spin transfer to occur by interaction with the unshared pair of the trivalent phosphorus compounds than with the pentavalent phosphorus compounds.

We have a number of other topics which I hope to report on during the next few months but which are not quite ready at the present time.

Yours sincerely,

Short title: Dynamic nuclear polarisation in phosphorus compounds.

**BRYN MAWR COLLEGE**  
**BRYN MAWR, PENNSYLVANIA 19010, USA**

DEPARTMENT OF CHEMISTRY

TEL: (215) LA 5-1000

23 April 1967

Prof. Barry Shapiro  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Barry:

The NMR Spectrum of 1,5-dimethylnaphthalene; or, a Deceptively Complicated Poor Girl's Decoupled Spectrum.

The analysis of the  $^1\text{H}$  NMR spectrum of 1,5-dimethyl-naphthalene, recorded at 60 MHz on a Varian A-56/60A spectrometer, reveals an unusual high-order splitting pattern, similar to those reported by DeWolf and Baldeschwieler [1] and by Freeman and others [2], the latter most recently at the 8th ENC under the title, "A Poor Man's Spin Decoupler."

We considered the aromatic protons in 1,5-dimethyl-naphthalene as two equivalent and uncoupled ABC systems, and neglected any coupling to the methyl groups. The spectrum is shown in Figure 1a (solvent,  $\text{CDCl}_3$ ). This spectrum resembles neither the usual ABX (for example) pattern nor its "deceptively simple" modifications [3].

However, as indicated by DeWolf and Baldeschwieler, this pattern can be interpreted as the result of a fortuitous overlap of an A-transition with a B-transition, each of which carries the same C spin state. This overlap requires the appearance of high-order structure in the AB region of the spectrum, and the possibility of new structure (analogous to "spin-tickling" double resonance experiments) in the C region. For example, if  $J_{ab}$ ,  $J_{ac}$  and  $J_{bc}$  are all positive, a high-field line in the A spectrum has frequency  $-v_{0a} - J_{ab}/2 - J_{ac}/2$ , and a highfield line in the B spectrum,  $-v_{0b} - J_{ab}/2 - J_{bc}/2$ , where the usual notation is used. If these lines overlap,  $-v_{0b} + v_{0a} + (J_{ac} - J_{bc})/2 = 0$ , which is identical to the statement about matrix elements of the Hamiltonian,  $\langle \alpha\beta\alpha | H | \alpha\beta\alpha \rangle = \langle \beta\alpha\alpha | H | \beta\alpha\alpha \rangle$ . Therefore, the overlap of the A line and the B line forces the difference between the diagonal elements of H mentioned to be much less than the off-diagonal element  $\langle \alpha\beta\alpha | H | \beta\alpha\alpha \rangle = J_{ab}/2$ , and the appearance of unusual high-order splitting in the AB region. This condition also implies

Prof. Barry Shapiro  
23 April 1967  
Page Two

that, in order for such an effect to occur,  $\delta_{ab} = (J_{ac} - J_{bc})/2$ .

In the spectrum shown, it is difficult to tell the relative sign of  $J_{bc}$  by inspection because the absolute magnitude of this coupling is so small. The calculation shown in Figure 1b offers a least-squares error fit to the experimental spectrum to within experimental error (approximately 0.8 hz); the calculation shown in Figure 1c, with  $J_{bc}$  of opposite sign relative to  $J_{ab}$  and  $J_{ac}$  gives a least-squares error of more than twice that of calculation 1b.

The spectrum of 1,5-dimethylnaphthalene in  $C_6D_6$  is shown in Figure 1d. Here, the effect of the fortuitous overlap of the A and B lines is somewhat less dramatic. As Freeman has shown, in molecules where the chemical shift may be very dependent on the solvent, the "poor man's (or, for us, girl's) spin decoupling" technique may be extremely valuable in spectral assignment.

The spectrum of 1,5-dimethylnaphthalene reported earlier [4] at resolution lower yet was analyzed with slightly different values of coupling constants. We acknowledge the guidance of Professor Ernst Berliner of this Department; the analysis of the NMR spectrum of 1,5-dimethylnaphthalene was originally undertaken as part of his research in aromatic substitution.

Sincerely yours,

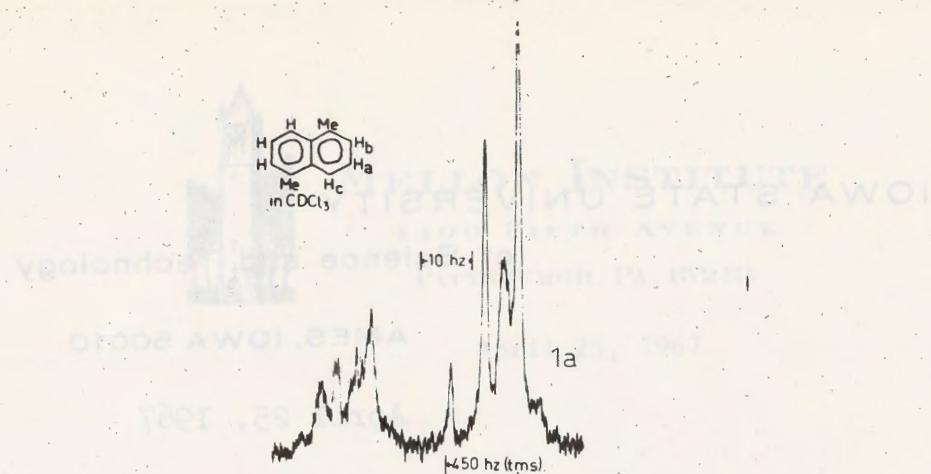
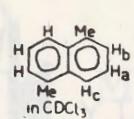
*Jean B. Kim*

Jean B. Kim

*Jay:*

Jay Martin Anderson

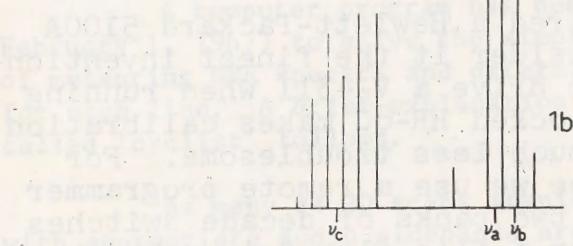
- [1] M. Y. DeWolf & J. D. Baldeschwieler, J. Mol. Spectry. 13, 344 (1964).
- [2] R. Freeman, Mol. Phys. 11, 505 (1966); N. S. Bhacca & R. Freeman, 8th ENC, 2 March 1967; J. Chem. Phys., in press.
- [3] For example, J. W. Emsley, J. Feeney, and L. H. Sutcliffe, High Resolution Nuclear Magnetic Resonance Spectroscopy, pp. 357-364.
- [4] C. MacLean and E. L. Mackor, Mol. Phys. 3, 223 (1960).



Dr. Bernard L. Shapiro  
Department of Chemistry  
Illinois Institute of Technology  
Chicago, Illinois 60616

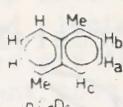
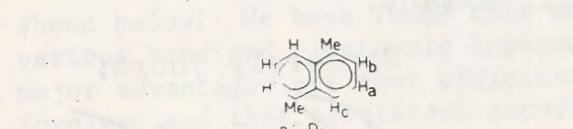
$$\begin{aligned} \nu_a &= -440.2 \\ \nu_b &= -436.7 \\ \nu_c &= -471.2 \\ J_{ab} &= 6.8 \\ J_{ac} &= 8.0 \\ J_{bc} &= +1.0 \end{aligned}$$

Dear Dr. Shapiro:

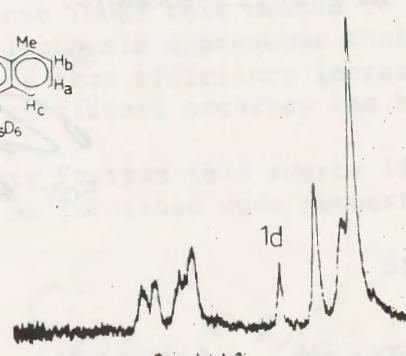


$$J_{bc} = -1.0$$

The program determines the scale factor for each spectrum, and to obtain the best fit with respect to the sidebands and the distribution of the peaks, the coupling constants and the relative intensities are varied until the best fit is obtained.



Instructions will be given



Robert J. Kosman

## IOWA STATE UNIVERSITY

of Science and Technology



AMES, IOWA 50010

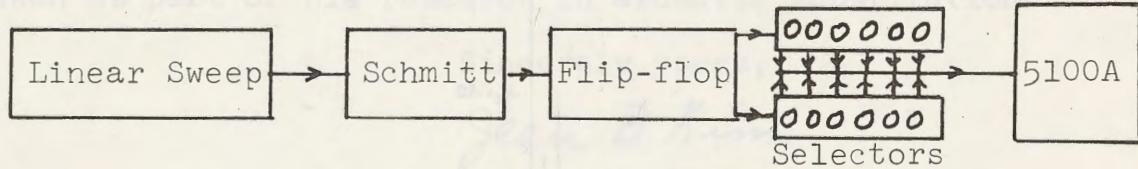
Department of Chemistry

April 25, 1967

Dr. B. L. Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Barry:

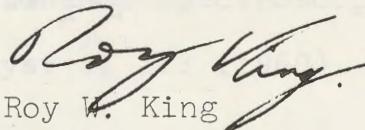
We have recently acquired a Hewlett-Packard 5100A frequency synthesizer and consider it the finest invention since the wheel. Using it to drive a V-4311 when running  $^{31}\text{P}$  or  $^{19}\text{F}$  on our old and unlocked HR-60 makes calibration easy and sideband ambiguity much less troublesome. For quick observation on the scope we use a remote programmer on the  $10^{-2}$ - $10^3$  decades with two banks of decade switches selected by a manual switch or a flip-flop driven by the linear sweep flyback:



With sample and reference peaks displayed on alternate sweeps of the long-persistence CRO rapid calibration to at least  $\pm 5$  Hz can be achieved by superimposition, even for very large shifts.

Further talents of this very versatile device are being explored and will be reported in these letters provided, as we all hope, that they are still extant.

Sincerely yours,

  
 Roy W. King

RWK/ld

MELLON INSTITUTE  
 4400 FIFTH AVENUE  
 PITTSBURGH, PA. 15213

April 25, 1967

Dr. Bernard L. Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Dr. Shapiro:

A computer program has been written (Mellon Institute Report February 1, 1967) to solve the simple, nevertheless time-consuming, problem of measuring NMR spectra and determining an accurate experimental frequency for each line. A brief explanation of the procedure and of the program called 'cyclist' follows.

As many as 20 scans (typically an equal number in each direction) with appropriate audio sidebands are made over the region of interest. The observed lines (max. 500 each spectrum) are assigned a number (1 to n) beginning with the line of lowest frequency. The relative position of each line with respect to the sidebands is measured in centimeters and recorded. These measurements together with the centimeter position and frequency of each sideband are punched on data cards. (Twelve measurements may be punched per card.)

The program determines a scale factor Hz/cm for each spectrum sheet, interpolates the line position with respect to the sidebands and assigns a frequency in Hz to each line. Each line then has a distribution of frequencies that corresponds to the number of spectrum sheets on which it appeared. From this data the mean frequency of each line is determined and the rms error for each distribution is obtained. The output also contains the mean rms error of all measurements.

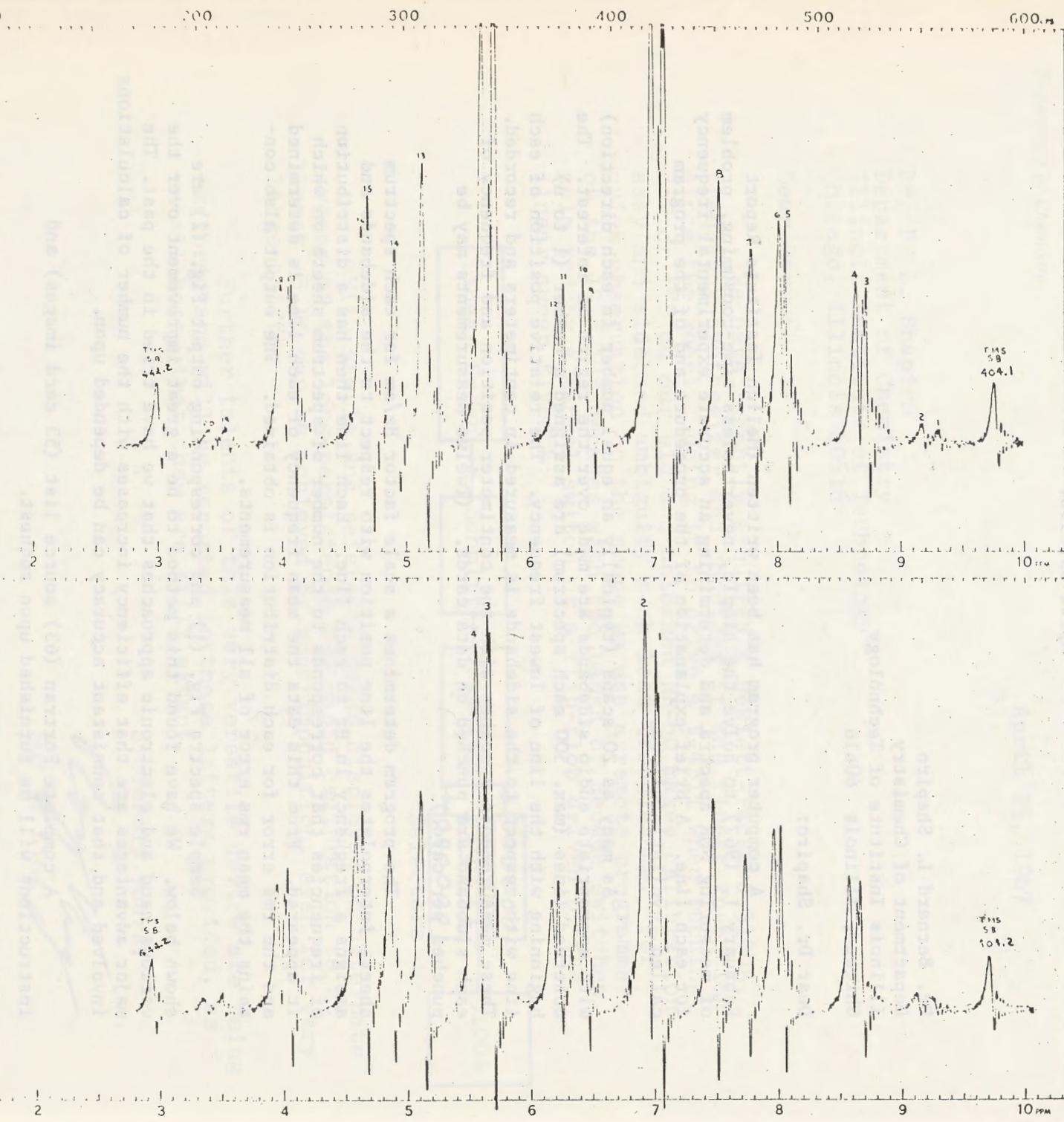
Sample spectra Fig. (1) and corresponding output Fig. (2) are shown below. We have found this method to be a great improvement over the various hand and electronic approaches that we have tried in the past. The major advantages are that efficiency increases with the number of calculations involved and that consistant accuracy can be depended upon.

A complete Fortran (63) source list (53 card images) and instructions will be furnished upon request.

Sincerely yours,

DEW, RJK:cac

*Dennis E. Wisnosky Robert J. Kostelnik*  
Dennis E. Wisnosky Robert J. Kostelnik



## ORTHODICHLOROBENZENE

LINE	SPECTRUM 16878	SPECTRUM 16879	SPECTRUM 16880	SPECTRUM 16881	LINE	MEAN	RMS ERROR
1	406.79 CPS	406.76 CPS	406.77 CPS	406.79 CPS	1	406.780	.008
2	407.59 CPS	407.59 CPS	407.63 CPS	407.64 CPS	2	407.611	.016
3	410.24 CPS	410.28 CPS	410.28 CPS	410.33 CPS	3	410.284	.022
4	410.73 CPS	410.78 CPS	410.76 CPS	410.84 CPS	4	410.777	.025
5	414.12 CPS	414.13 CPS	414.09 CPS	414.14 CPS	5	414.121	.013
6	414.43 CPS	414.49 CPS	414.56 CPS	414.48 CPS	6	414.492	.032
7	415.76 CPS	415.72 CPS	415.72 CPS	415.82 CPS	7	415.755	.028
8	417.30 CPS	417.28 CPS	417.29 CPS	417.31 CPS	8	417.292	.008
9	423.44 CPS	423.44 CPS	423.49 CPS	423.52 CPS	9	423.473	.023
10	423.76 CPS	423.80 CPS	423.79 CPS	423.86 CPS	10	423.802	.026
11	424.72 CPS	424.75 CPS	424.76 CPS	424.82 CPS	11	424.763	.024
12	425.03 CPS	425.07 CPS	425.10 CPS	425.14 CPS	12	425.087	.025
13	431.46 CPS	431.42 CPS	431.37 CPS	431.29 CPS	13	431.384	.041
14	432.79 CPS	432.96 CPS	432.88 CPS	432.94 CPS	14	432.894	.044
15	434.07 CPS	434.15 CPS	434.11 CPS	434.20 CPS	15	434.132	.032
16	434.39 CPS	434.47 CPS	434.45 CPS	434.54 CPS	16	434.463	.035
17	437.75 CPS	437.78 CPS	437.74 CPS	437.83 CPS	17	437.773	.023
18	438.24 CPS	438.27 CPS	438.21 CPS	438.28 CPS	18	438.251	.017
19	440.92 CPS	440.93 CPS	440.93 CPS	440.89 CPS	19	440.918	.010
20	441.73 CPS	441.69 CPS	441.72 CPS	441.75 CPS	20	441.722	.014

GLOBAL RMS ERROR IS .023

## ORTHODICHLOROBENZENE (LINES WHICH WENT OFF SPECTRA 16878 THRU 16881)

LINE	SPECTRUM 16882	SPECTRUM 16883	LINE	MEAN	RMS ERROR
1	420.04 CPS	419.99 CPS	1	420.015	.041
2	420.60 CPS	420.50 CPS	2	420.546	.071
3	428.09 CPS	428.00 CPS	3	428.047	.061
4	428.70 CPS	428.54 CPS	4	428.623	.111

GLOBAL RMS ERROR IS .071

Fig. 2

## THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

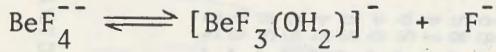
DEPARTMENT OF CHEMISTRY

April 26, 1967

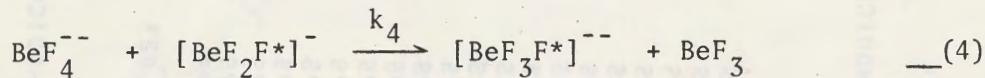
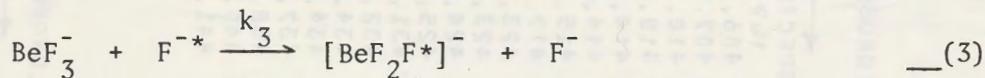
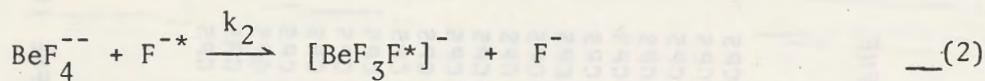
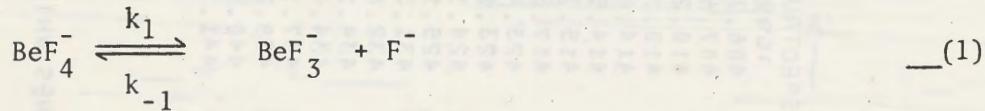
Dr. B. L. Shapiro  
 Illinois Institute of Technology  
 Chicago, 60616  
 U. S. A.

Dear Barry,

We have done some studies of the  $^{19}\text{F}$  magnetic resonance of fluoroberyllate ions in solution. The equilibrium constant for the dissociation reaction; -



was determined from intensity measurements as  $K_e = 8.0 \pm 0.9 \times 10^{-2}$  moles  $\text{Kg}^{-1}$ . Line width studies show that in addition to the dissociation and re-association process there is fluoride ion exchange. We have analysed the reactions according to the following scheme and we give below the rough rate constants. These are correct within a factor of three at  $33^\circ\text{C}$ .



$$k_1 \approx 23.8 \text{ secs}^{-1}$$

$$k_{-1} \approx 3 \times 10^2 \text{ mole}^{-1} \text{ sec}^{-1}$$

$$k_2 \approx 4.3 \times 10^2 \text{ mole}^{-1} \text{ sec}^{-1}$$

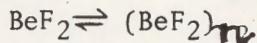
$$k_3 \approx 4.5 \times 10^2 \text{ mole}^{-1} \text{ sec}^{-1}$$

$$k_4 \approx 4.5 \times 10^2 \text{ mole}^{-1} \text{ sec}^{-1}$$

Page 2.

Dr. B. L. Shapiro  
April 26, 1967

The slow process is the insertion of a water molecule in the tightly bound tetrahedral arrangement in  $\text{BeF}_4^{--}$ . We also find two resonances in  $\text{BeF}_2$  solutions in water and evidence seems conclusive that a non dissociative equilibrium of the type:-



occurs.  $^9\text{Be}$  chemical shifts do not change very much as might be expected.

We are preparing a paper which will contain these conclusions as well as other aspects of the problem. We have ambitions to do a complete line shape fit so as to get better rate constants and attempt a temperature study. To this end we have been modifying in a small way the comparative Fortran IV program 'BLOKIN' written by Chuck Holm at Shell. Our aim of making this iterative is now virtually accomplished. Mr. Stewart has been largely responsible for this work. The basic program will handle up to 30 lines with simultaneous exchange occurring. The rates in equations (1)-(4) can be regarded as a simple form of a 9 site problem where the spin states of the  $^9\text{Be}$  nucleus produce quadruplets for  $\text{BeF}_3^-$  and  $\text{BeF}_4^{--}$ .

All Best Wishes,

L. W. Reeves  
Professor

LWR/bas

REPLY TO:  
 ROHM AND HAAS COMPANY  
 REDSTONE RESEARCH LABORATORIES  
 HUNTSVILLE, ALA. 35807  
 (205) 876-9042



April 20, 1967

Professor Bernard L. Shapiro  
 NMR IIT Letters  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Barry,

F<sup>19</sup> and P<sup>31</sup> NMR of P<sub>2</sub>F<sub>4</sub>

In cooperation with Dr. Ralph Rudolph (F. J. Seiler Research Laboratory, U. S. Air Force Academy), I've been working on the P<sup>31</sup> and F<sup>19</sup> spectra of P<sub>2</sub>F<sub>4</sub>, diphosphorous tetrafluoride. This is one of the few AA'A''A'''XX' systems I am aware of and this one has some interesting quirks.

First, the F<sup>19</sup> spectra are identical at 12.8, 40 and 56 Mc - thus all the F's have the same shift, as do the two P's. Second, we observe no changes in F<sup>19</sup> spectra down to -150°C, implying the configuration is fixed.

Proceeding on these assumptions we have arrived at the constants in Table I, following Harris [Mol. Phys., 10, 437 (1966)] and Lynden-Bell [Mol. Phys., 6, 601 (1963)].

Table I  
Coupling Constants of P<sub>2</sub>F<sub>4</sub>

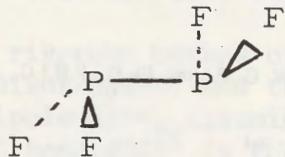
J <sub>PF</sub> (direct)	= 1198.5 cps	J <sub>FF</sub>	= 34.4 cps
J' <sub>PF</sub> (distant)	= -67.5 cps	J' <sub>FF</sub>	= 0.0 cps
J <sub>PP</sub>	= 227.4 cps	J <sub>FF</sub> (gem)	~ 300 cps

The relative signs of J<sub>PF</sub> and J'<sub>PF</sub> are certain - all others appear to be indeterminate. One of the J<sub>FF</sub>'s must be 0 ± 0.5 cps - this leads to extensive degeneracy (only four "characteristic" lines of the eight described by Lynden-Bell), and makes the calculated spectra quite insensitive to relative signs and to the magnitude of J<sub>FF</sub> (gem). The three values in column one are all quite similar to known values - the three in the second column appear to be the first of their kind.

MARCH 1967  
THE UNIVERSITY OF TORONTO  
TECHNICAL INFORMATION SERVICE



IR and Raman spectra indicate the structure is "trans" i.e.



We have tentatively assigned  $J_{FF} = 34.5$  to the 'trans' coupling (dihedral angle  $\sim 180^\circ$ ) and  $J_{FF} = 0$  to the 'cis' ( $< \approx 80^\circ$ ), although this is admittedly rather speculative.

Sincerely,

*Fred*

Frederic A. Johnson  
(205) 876-9037

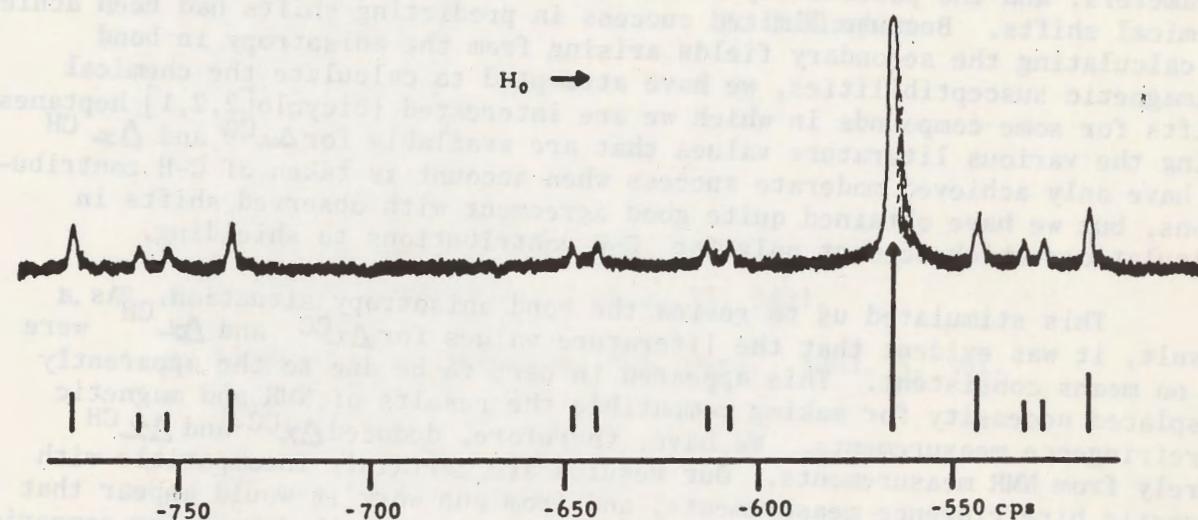


Figure 1 -  $^{19}F$  Low Field Half-Spectrum of  $P_2F_4$  at 40 Mc



## THE UNIVERSITY OF ASTON IN BIRMINGHAM

GOSTA GREEN . BIRMINGHAM 4.

TELEPHONE 021-359 3611

The Department of Chemistry.

Head of Department: Professor W. G. Parker, Ph.D., F.R.I.C., A.F.R.Ae.S.

Our Ref JH/DBB/CHEM

Your Ref

Telephone Ext. 458

25th April, 1967

Professor B. L. Shapiro,  
 Department of Chemistry,  
 Illinois Institute of Technology,  
 Chicago, Illinois 60616, U.S.A.

Dear Professor Shapiro,

C-C and C-H Bond Diamagnetic Anisotropies

Thank you for your reminder that a subscription to the IIT N-M-R newsletter is due from us. Recently, we have been commissioning a new laboratory to accommodate both our existing Perkin-Elmer R10, together with our new addition, the last of the A.E.I. R.S2 spectrometers. Nevertheless, we have found sufficient time to do some NMR research, and would like to inform you of some of our findings.

Considerable interest has been shown in bond diamagnetic susceptibility parameters, and the possibility of using these in the calculation of proton chemical shifts. Because limited success in predicting shifts had been achieved by calculating the secondary fields arising from the anisotropy in bond diamagnetic susceptibilities, we have attempted to calculate the chemical shifts for some compounds in which we are interested (bicyclo[2,2,1] heptanes). Using the various literature values that are available for  $\Delta\chi_{CC}$  and  $\Delta\chi_{CH}$  we have only achieved moderate success when account is taken of C-H contributions, but we have obtained quite good agreement with observed shifts in calculations which account only for C-C contributions to shielding.

This stimulated us to review the bond anisotropy situation. As a result, it was evident that the literature values for  $\Delta\chi_{CC}$  and  $\Delta\chi_{CH}$  were by no means consistent. This appeared in part to be due to the apparently misplaced necessity for making compatible the results of NMR and magnetic birefringence measurements. We have, therefore, deduced  $\Delta\chi_{CC}$  and  $\Delta\chi_{CH}$  purely from NMR measurements. Our results are certainly incompatible with magnetic birefringence measurements, and from our work it would appear that the reason for this could be due to a fallacy in the method used for comparing

continued...

Professor B. L. Shapiro.

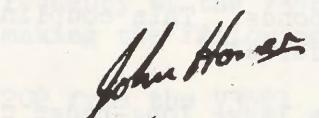
- 2 -

25th April, 1967

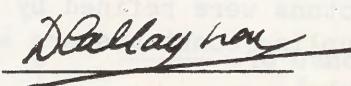
the data from the two techniques. The generally accepted method of comparison is essentially dependent on the assumption that bond magnetic susceptibility components are truly additive. We consider that unlike some other bond parameters this is not the case for bond susceptibilities.

We have devised a rigorous method of estimating both the magnitudes of the C-C and C-H bond anisotropies, and the point along the C-H bond at which the induced point dipole acts, assuming that the C-C point dipole acts from the centre of the C-C bond.  $\Delta\chi_{CC}$  is found to be  $+4.3 \times 10^{-6} \text{ cm}^3 \text{ mole}^{-1}$  and  $\Delta\chi_{CH}$  is zero, or less likely to have a small negative value not exceeding  $-1.2 \times 10^{-6} \text{ cm}^3 \text{ mole}^{-1}$ , in which case the point dipole acts from the carbon atom. The negative sign is surprising, but Zurcher<sup>1</sup> has previously found a value of  $-0.74 \text{ cm}^3 \text{ mole}^{-1}$  for  $\Delta\chi_{CH}$ . These values, which incidentally agree very favourably with those obtained by Moritz and Sheppard,<sup>2</sup> and other workers who have based their calculations only on NMR data, enable relative shifts for a wide range of hydrocarbons to be predicted.

Yours sincerely,



J. Homer



D. Callaghan

1. R. F. Zurcher, J.Chem.Phys., 1962, 37, 2421.
2. A. G. Moritz and N. Sheppard, Mol. Phys., 1962, 5, 361.

## THE U. S. Lederle LABORATORIES BRUNTINGHAM



A Division of AMERICAN CYANAMID COMPANY

PEARL RIVER, NEW YORK 10865

AREA CODE 914 735-5000

April 26, 1967

Dr. B. L. Shapiro  
 Illinois Institute of Technology  
 Technology Center  
 Chicago 16, Illinois

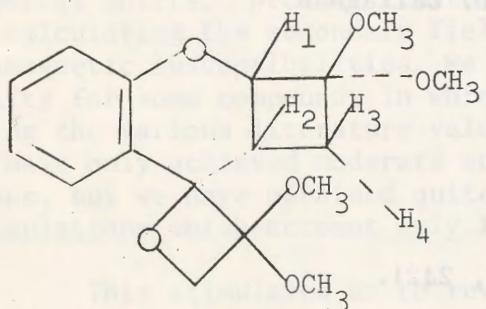
Dear Doctor Shapiro:

An Example of Long-range Coupling Across Four Single Bonds

We wish to report on an interesting example of long-range coupling across four single bonds. This coupling ( $J_{1,3}$ ) is appreciably larger than is normally observed.<sup>1</sup>

We believe that this large long-range coupling ( $J_{1,3}$ ) occurs by the "Meinwald" type mechanism, that is, direct overlap<sup>2</sup> between the small orbitals of the carbon atoms involved.

The initial approximate coupling constants and chemical shifts for the cyclobutane protons were refined by computer analysis.<sup>3</sup> The structure and refined coupling constants are as follows:



$J_{1,2}$	= + 8.2 cps
$J_{1,3}$	= + 3.5 cps
$J_{1,4}$	= + 0.6 cps
$J_{2,3}$	= + 8.9 cps
$J_{2,4}$	= + 9.1 cps
$J_{3,4}$	= -12.9 cps

A more detailed discussion on the stereochemistry involved will be published shortly in Tetrahedron Letters, J. W. Hanifin, Jr. and G. O. Morton.

1. A Review: S. Sternhell, Rev. Pure and Appl. Chem. 14 26 (1964).
2. J. Meinwald and A. Lewis, J. Am. Chem. Soc., 83, 2769 (1961).
3. J. D. Swalen and C.A. Reilly, J. Chem. Phys., 37, 21 (1962).

Very truly yours,

*G.O. Morton W. Fulmor*

G. O. Morton and W. Fulmor

CYANAMID

## AMERICAN CYANAMID COMPANY

STAMFORD RESEARCH LABORATORIES

1937 WEST MAIN STREET, STAMFORD, CONN. 06904

AREA CODE 203 348-7331

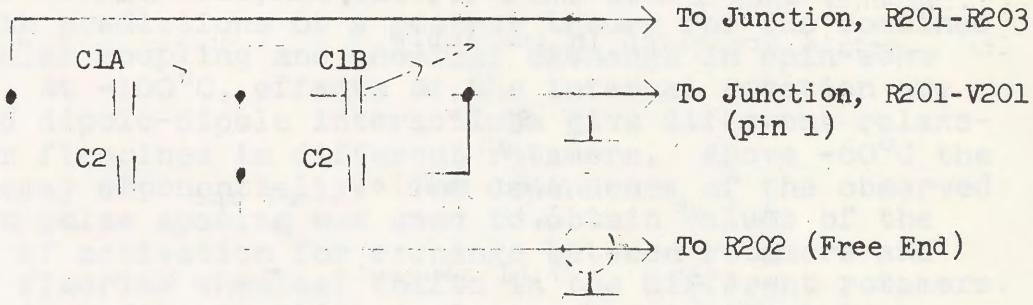
April 28, 1967

Dr. B. L. Shapiro  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Barry:

The 2kHz modulation frequency of the V3521 integrator can be varied approximately  $\pm 5\%$  by making the following modification:

- (1) Remove C201 and C202 from the V3521.
- (2) Install the following circuit:



C1 - 3.6 to 52 pf (Hammarlund type HFD-50)

C2 - Approximately 1000 pf, silver mica, selected to give center frequency of 2000 Hz.

We have found this useful in eliminating interferences between centerband peaks in an F<sup>19</sup> spectrum and their sideband responses when their chemical shifts are accidentally some multiple of the modulation frequency. Homo-nuclear spin decoupling is also facilitated when the modulation can be set exactly to 2000 Hz.

Sincerely,

A. F. Barney

J. E. Lancaster

jan

ORGANISK-KEMISK LABORATORIUM  
DEN POLYTEKnisKE LÆREANSTALT  
Bygning 201 . Lyngby . Danmark  
Tlf. (01) 88 25 66

LYNGBY 31. may 1967.

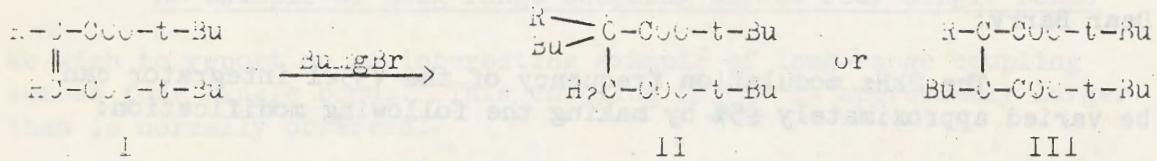
Dr. B.L.Shapiro,  
Dept. of Chemistry,  
Illinois Institute of Technology,  
Chicago, 60616, U.S.A.

magnetic non-equivalence/equivalence in  
methylene groups.

Dear Dr. Shapiro,

I wish to report an example of magnetic equivalence of methylene protons in a case where non-equivalence would have been expected.

Investigating the product distribution from the reaction:



R = Me, Et and i-Pr.

I have found that the  $\alpha$ -methylene protons in II exhibit magnetic non-equivalence when R = Me and i-Pr, but, surprisingly, not when R = Et. The data are given in the table

(1 mol)	$\tau_{\text{ah}}$	$\delta$
R = Me	7,68 doublet 7,42 -	17 cps
R = Et	7,51 singlet	-
R = i-Pr	7,52 doublet 7,37 -	16 cps

An explanation might be, that the neighbouring  $\alpha'$ -carbon-atom is "less asymmetric" when substituted with ethyl, butyl than with methyl, butyl or isopropyl, butyl - but I have found nothing in the literature confirming this explanation.

I would like to hear your comments.

Yours sincerely

Egon Roenfeldsen

Egon Roenfeldsen

## UNIVERSITY OF ILLINOIS

THE WILLIAM ALBERT NOYES LABORATORY

May 4, 1967

Professor Bernard L. Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Barry:

This is in reply to your letter of April 17th reminding me that I should pay for my subscription.

For this purpose I wish to report the results of a recently completed fluorine spin-echo study of internal rotation in liquid 1,1-difluoro-1,2-dibromodichloroethane. This work was actually done by Bob Vold.

Carr-Purcell spin-echo (CPSE) trains were observed from  $-115^{\circ}$  to  $+100^{\circ}\text{C}$  with rf pulse spacings of 0.4 msec to 32 msec. Modulation of the echo trains was observed at temperatures below  $-60^{\circ}\text{C}$ , and the modulation frequencies were found to agree quantitatively with predictions of a general theory for the combined effects of scalar coupling and chemical exchange in spin-echo experiments.<sup>1</sup> At  $-100^{\circ}\text{C}$ , effects of the internal rotation are negligible and dipole-dipole interactions give different relaxation rates for fluorines in different rotamers. Above  $-60^{\circ}\text{C}$  the echo trains decay exponentially. The dependence of the observed decay rates on pulse spacing was used to obtain values of the free energies of activation for exchange between rotamers and values of the fluorine chemical shifts in the different rotamers. The free energies of activation are in agreement with values obtained by steady state NMR, and by analysis of CPSE trains at lower temperatures, but the apparent chemical shift values are about 25% too large.

I hope this will fill the bill for the time being at least.

Sincerely yours,

*H. S. Gutowsky*  
 H. S. Gutowsky

HSG:jml

<sup>1</sup>H. S. Gutowsky, R. L. Vold, and E. J. Wells, J. Chem. Phys. 43, 4107 (1965).

Subject: Spin-Echo Studies of Internal Rotation in  $\text{CF}_2\text{BrCCl}_2\text{Br}$ .

ORGANIC BULGARIAN  
ACADEMY OF SCIENCES  
INSTITUTE OF ORGANIC CHEMISTRY

Sofia, the May 4 1967

Sofia 13

Professor B.L.Shapiro

Department of Chemistry

Illinois Institute of Technology

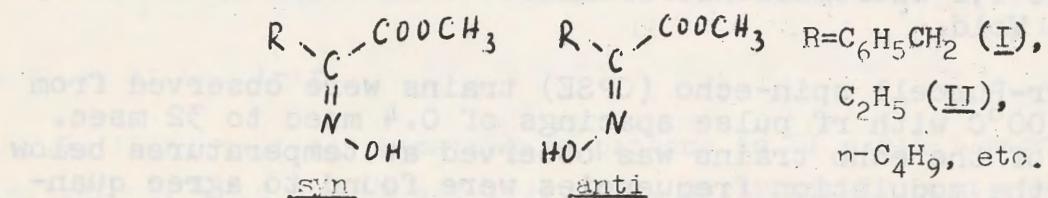
Chicago, Illinois 60616

Subject: Rotational Isomerism in  $\alpha$ -Oximino-Esters

Dear Dr.Shapiro:

We studied the NMR-spectra of the syn- and anti-forms of some

$\alpha$ -oximino-esters<sup>1)</sup>:



The spectra of the anti-isomers are quite trivial, but for

the syn-isomers are observed double signals for the most

proton-containing groups, as  $\text{CH}_2$  and  $\text{CH}_3\text{O}$  in syn-I, (see the

figure),  $\text{C}_2\text{H}_5$  and  $\text{CH}_3\text{O}$  in syn-II, etc. Almost no changes are

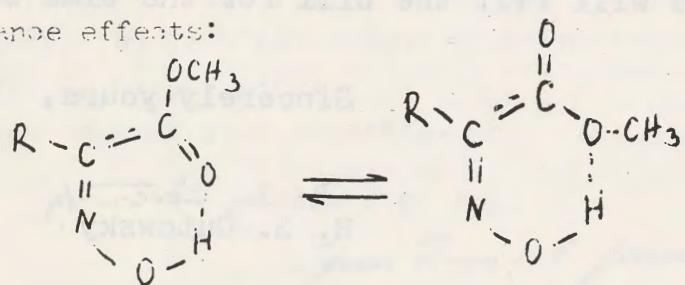
noted in the spectra of the syn-forms in various solvents,

and also in the temperature interval 30 to 150°C.

We propose that the syn- $\alpha$ -oximino-esters exist as mixtures

of two rotational isomers, stabilized by hydrogen bonding

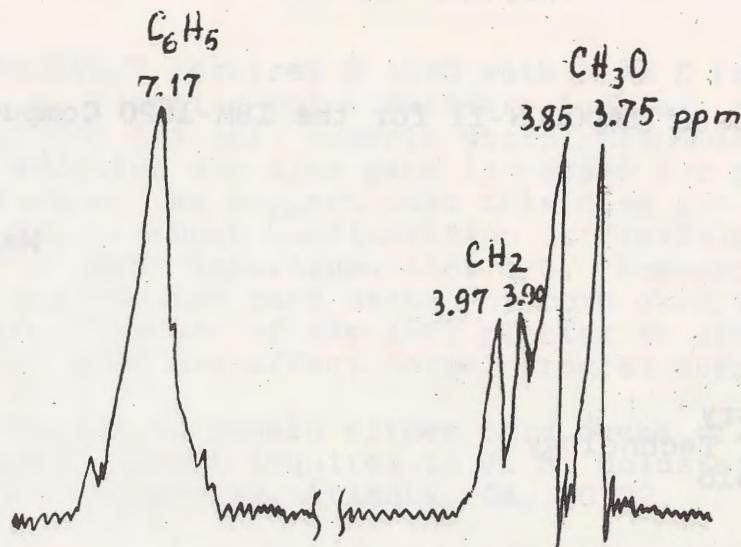
and resonance effects:



Prof. B.L. Shapiro

-2-

May 4, 1967



From the chemical shift difference of 2.3 Hz (at 60 MHz) between the  $CH_3O$ -signals of syn-II at  $150^\circ C$ , the calculated lower limit of the rotational barrier  $\Delta F^\ddagger$  is 24 kcal./mole.

The magnitude of the barrier suggests that some syn- $\alpha$ -oxirino-esters might be separated into rotational isomers, as in the cases of substituted amides<sup>2)</sup> and nitrosamines<sup>3)</sup>. Our investigations, which are carried in collaboration with scientists from Germany and Czechoslovakia include besides NMR, also dipole moment measurements and calculations, H-D exchange, IR, and chemical studies. The results are already sent to the Monatshefte für Chemie<sup>4)</sup> and further work is in progress.

Yours sincerely,

*Stefan Spassov*

Stefan L. Spassov

- 1) H. Reinheckel, Monatsber. Dtsch. Akad. Wiss. Berlin 1, 42 (1959); Monatsh. Chem. (in press).
- 2) H. A. Staab and D. Lauer, Tetrahedron Letters 4593 (1966).
- 3) A. Mannschreck, H. Münsch, and A. Mattheus, Angew. Chem. 78, 751 (1966).
- 4) S. L. Spassov, G. Heublein, A. Joytscheff, H. Reinheckel, and V. Jehlicka, Monatsh. Chem. (in press).

EMORY UNIVERSITY  
ATLANTA, GEORGIA 30322

DEPARTMENT OF CHEMISTRY

Adaptation of LAOCOON-II for the IBM-1620 Computer

May 4, 1967

Dr. B. L. Shapiro  
Department of Chemistry  
Illinois Institute of Technology  
Chicago, Illinois 60616

Dear Barry:

A recently completed project of ours may be of interest to a number of your readers. For the past several months we have been involved in adapting the Bothner-By-Castellano program, LAOCOON-II, for use on the relatively small IBM 1620 computer. The resulting 1620-SPS-III program, which we call PROSPECT-1, should permit 1620 users to perform many of the sophisticated spectral analyses that previously required a large computer such as the IBM 7090.

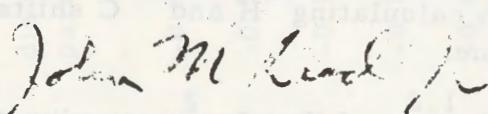
PROSPECT is capable of both computing spectra from a set of trial parameters and also making the iterative refinements of these parameters in order to produce a "best" fit between the calculated and observed spectra. Like version two of LAOCOON, PROSPECT is written in two parts. Part 1 will calculate the theoretical spectrum of any system of from three to seven 1/2-spin nuclei. Output of the theoretical spectrum may then be obtained on either the standard print unit or an online curve plotter. Part 2, which performs the iterative calculations, will operate on any system from 3 to 5 spins in size. In the future we hope to extend part 2 to even larger systems.

We feel that PROSPECT could be of great value to those persons who either do not have access to large computers or, like us, find the smaller system more convenient. Accordingly we would like to make this program available to interested parties. However, there are some problems associated with distributing the program. First, since we do not have the facilities to prepare and ship the card decks, this will have to be done by a local computer center at some small cost to the user. By far the more serious problem concerns the wide variety of 1620 configurations available. There will be quite a few 1620 systems on which PROSPECT will not operate and we ask the potential user to carefully check the machine requirements listed in the next paragraph so that he may be certain the program will (or will not) work on his 1620.

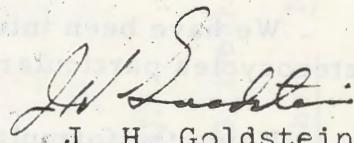
THE OHIO STATE UNIVERSITY  
DEPARTMENT OF CHEMISTRY  
COLLEGE OF LIBERAL ARTS  
1966-1967

For execution PROSPECT requires a 1620 with a 40 K (or larger) memory, a 1311 disk drive, floating point hardware indirect addressing and the special instructions transmit numeric strip, transmit numeric fill and move flag. In addition one disk pack is needed for program and intermediate data storage. We suggest that this disk not be used for other programs. The input/output configuration is flexible. The program as written is for paper tape/typewriter I/O. However, in the near future we do plan to generate the card decks for both card/typewriter and card/line printer I/O. The use of the 1627 plotter is strictly optional. The lack of a plotter will not affect normal program operation.

Those persons wishing to obtain either card decks or paper tape copies of PROSPECT should address inquiries to J. H. Goldstein, Chemistry Department, Emory University, Atlanta, Ga. 30322.



John M. Read, Jr.



J. H. Goldstein

## THE OHIO STATE UNIVERSITY

DEPARTMENT OF CHEMISTRY  
88 WEST 18TH AVENUE  
COLUMBUS, OHIO 43210

May 5, 1967

Dr. B. L. Shapiro  
Chemistry Department  
Illinois Institute of Technology  
Chicago, Illinois 60616

Dear Barry:

We have been interested in calculating  $^1\text{H}$  and  $^{13}\text{C}$  shifts in heterocycles particularly pyridine.

Using the formulas of Pople<sup>1,2</sup> and Karplus<sup>2</sup> in conjunction with Mataga and Nishimoto's<sup>3</sup> SCF wave function we calculated diamagnetic and paramagnetic terms both for a purely covalent and partially ionic sigma framework.<sup>4</sup> These shifts are listed in the table below. Also shown are the direct  $\pi$ -electron density shifts obtained from 160 ppm/electronic charge for  $^{13}\text{C}$  and 10 ppm/electronic charge for  $^1\text{H}$ . All the shifts in the table are in ppm with respect to benzene.

It is seen that it doesn't matter much whether the sigma bonds are ionic or not. The sums of the diamagnetic and paramagnetic terms correlate very badly with the observed shifts. On the other hand if the direct  $\pi$ -density term is included the correspondence between observed and calculated values is remarkable.

In principle one should not have to include the  $\pi$ -density effect as a separate term. It is not clear why the above treatment works so well. Perhaps certain effects are undervalued due to approximations in the theory. We are trying other wave functions.

With best regards.

Sincerely yours,

GF:mhj

Gideon Fraenkel

*Gideon*

Tadashi Tokuhiro

*Tadashi Tokuhiro*

## Calculated and Observed Shifts for Pyridine

		<sup>13</sup> C			<sup>1</sup> H				
		calc	dia + para	calc charge	obs <sup>5</sup>	dia + para	calc charge	$\zeta$ calc	obs <sup>6</sup>
covalent	$\sigma \times$	-7.23		-13.8	-21.03	-21.9	-0.318	-0.86	-1.178
ionic	$\sigma \delta$	-9.58		-13.8	-23.38	-21.9	-0.358	-0.86	-1.218
covalent	$\sigma \beta$	+1.47		+ 2.8	+ 4.27	+ 4.2	-0.048	+0.172	+0.124
ionic	$\sigma \beta$	+3.66		+ 2.8	+ 6.46	+ 4.2	-0.045	+0.172	+0.127
covalent	$\sigma \delta$	-4.20		- 7.3	-11.50	- 7.7	+0.051	-0.454	-0.403
ionic	$\sigma \delta$	-1.75		- 7.3	- 9.05	- 7.7	+0.027	-0.454	-0.427

1. J. A. Pople, J. Chem. Phys., 37, 53 (1962).
2. M. Karplus and J. A. Pople, ibid, 38, 2803 (1963).
3. N. Mataga and K. Nishimoto, Z. physik. Chem., NF 13, 140 (1957).
4. Del Re, J. Chem. Soc., 4031 (1958).
5. P. C. Lauterbur, J. Chem. Phys., 43, 360 (1965).
6. This work.

BROWN UNIVERSITY *Providence, Rhode Island • 02912*

DEPARTMENT OF CHEMISTRY

May 10, 1967

Professor B. L. Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

Dear Professor Shapiro:

**MODIFICATION OF THE VARIAN HA-60-EL PROTON  
 STABILIZER FOR USE WITH OTHER NUCLEI**

The Varian NMR External Reference Proton Stabilization Controller has been adapted for stabilization of other nuclear resonances which can be observed at 14.1 kG. Field stabilization is achieved by mounting the Varian proton control probe (the "piggyback" probe) on the analytical probe of the nucleus of interest and sweeping the resonance frequency of the "piggyback" sample with a 60 MHz signal derived from a commercially available voltage controlled crystal oscillator (VCO). Sweeping the resonance frequency of the "piggyback" sample has the same effect as sweeping the current through the set of small coils which surround only this "piggyback" sample (the latter being the procedure in the conventional system), since the field stabilization system maintains the "piggyback" reference sample on resonance by adjusting the field whenever there is a shift in either field or frequency. This compensating field variation is "seen" by both the "piggyback" control and analytical samples so the sweep of the control sample resonance frequency results in a field sweep over the analytical sample resonance.

The use of a VCO is a compromise between a costly and highly stable frequency synthesizer, and a less expensive and relatively unstable conventional swept oscillator. A block diagram of the system is shown in Figure 1. The 15 MHz VCO is swept  $\pm$  5KHz by  $\pm$ 5V. A linear sweep voltage is provided by a Spectromagnetic Industries Model 9011 Sweep Generator. At the end of each sweep the voltage returns to zero in a time which depends on the length of the sweep. For most sweep times used, the flyback is sufficiently slow for the field stabilization system to remain locked to the proton resonance.

In order to provide an adjustable starting voltage for the sweep, a biasing voltage is added to the sweep voltage in an operational amplifier. The sum of these two voltages controls the frequency of the 15MHz oscillator. The VCO output is amplified to a 15V peak to peak level and fed into the Varian 60 MHz V-4311 rf unit at the junction of R107 and R105, which is the input to the first frequency doubler. The V101 oscillator tube in the V-4311 unit is removed.

- 2 -

Professor B. L. Shapiro

May 10, 1967

The system was tested on a  $^{31}\text{P}$  resonance at 24.3 MHz. The limiting factor on the stability of the system is the relative drift between the 60 MHz frequency of the control probe and the 24.3 MHz  $^{31}\text{P}$  resonance frequency. Figure 2 shows the low field quintet of diethyl phosphite taken at a sweep rate of about 1Hz/sec for which the coupling constant is 8.0 Hz.

I wish to acknowledge the encouragement of my thesis advisor, Professor Julian H. Gibbs, and the excellent technical assistance of Mr. Henry Klos, Mr. George Carnegis and Mr. Fred Bargoot.

This work was supported in part by U.S.P.H.S. grant GM-10906(06), Air Force grant AFOSR 1027-66, Army contract DA-18-035-AMC-274, A.E.C. contract AT(30-1)1983, the Advanced Research Projects Agency, and by a N.A.S.A. Traineeship in Chemistry.

Sincerely yours,

Stanley Kaufman

SK:emb

We have made a 1000 ohm resistor可供选择的在电路上的开关处。这样将能有效的减小在开关处的失真。这个可变电阻器被装在控制面板上，离振荡器的晶体管很近。一个100 ohm的可变电阻器被用来提供一个线性频率偏移，其范围从0到3赫兹。当可变电阻器的阻值为零时，频率偏移为3赫兹。当可变电阻器的阻值为1000欧姆时，频率偏移为0赫兹。在低频时，失真非常大，但随着频率的增加，失真逐渐减小。在1000赫兹时，失真已很小。

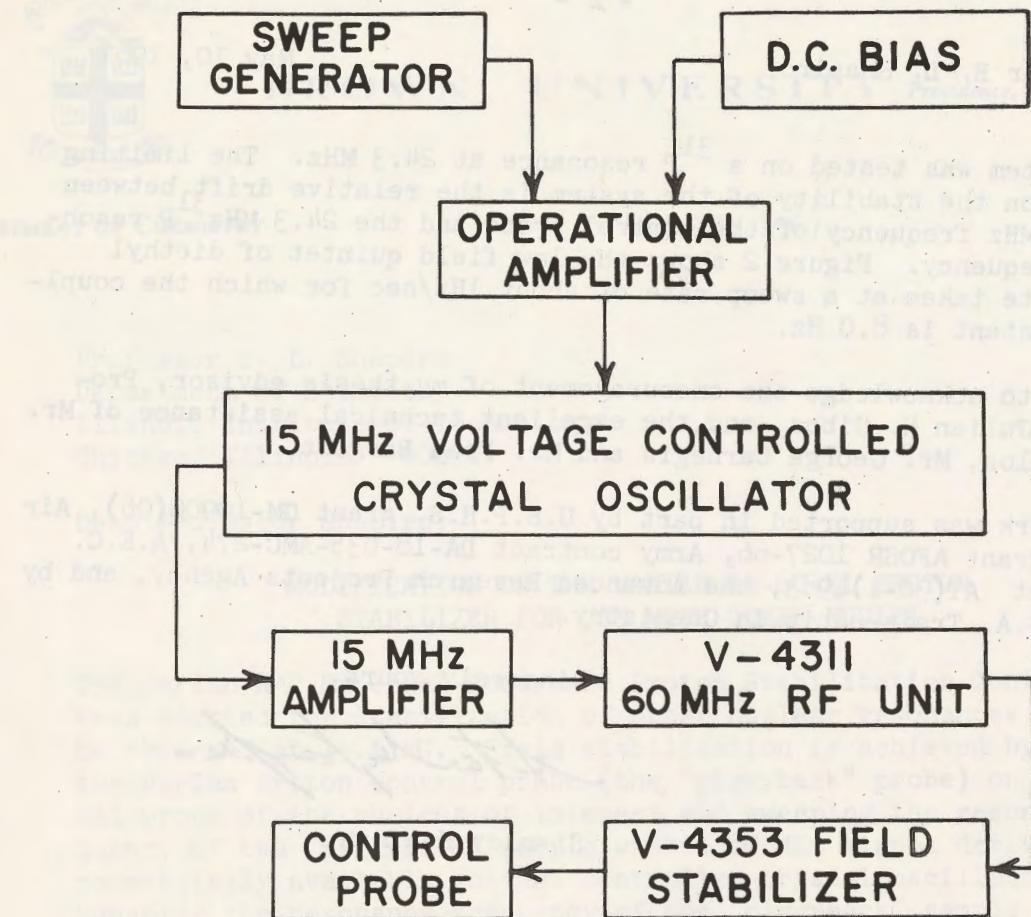


Figure 1.

Block diagram of the modified field stabilization system.

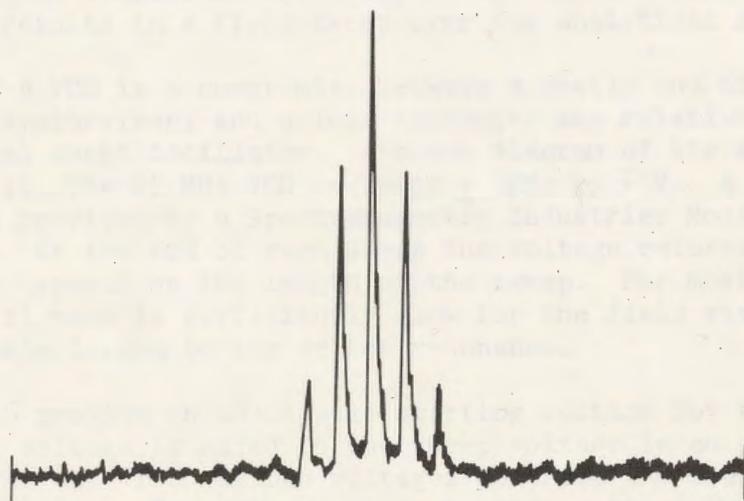


Figure 2.

The low field  $^{31}\text{P}$  spectrum of diethyl phosphite in a 5mm spinning sample tube, with a sweep rate of 1 Hz/sec.

ABBOTT



LABORATORIES FINE PHARMACEUTICALS, NORTH CHICAGO, ILLINOIS

May 5, 1967

Professor Barry Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Chicago, Illinois 60616

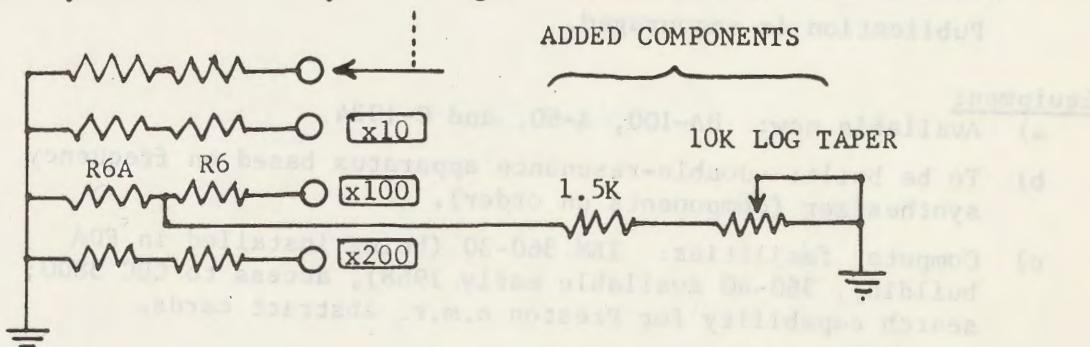
Dear Barry,

I regret that we have been out of touch with IIT NMR Newsletter so long. To rectify this situation, I wish to submit a simple but useful modification of an HA-100 system.

A Vernier Control for the HP 200AB Audio Oscillator

The Varian HA-100 NMR spectrometer can include a Hewlett Packard model HP 200AB audio oscillator which is used to generate  $H_2$ , the RF sideband used for double resonance experiments. The existing vernier on the oscillator is much too coarse for the fine adjustments needed in NMR work, particularly for spin tickling experiments.

We have added a 10K potentiometer to the resistance network on the range switch at a point where it will be effective only when the instrument is used in the X100 range. The potentiometer was mounted on the left side of the front panel above the range switch. A log taper pot was found to provide an output frequency shift reasonably linear with angular displacement of the control. This circuit shifted the oscillator by 3 Hz when the pot was at maximum resistance and provided a range of 9 Hz (the additional shift at zero resistance). There was no detectable distortion of the sine wave and with reasonable lead dress this modification did not affect the stability of the oscillator. The range of the adjustment could easily be increased by lowering the value of the 1.5K resistor.



Sincerely yours,

Milton I. Levenberg  
 Chemical Physics Laboratory



## DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

FOOD AND DRUG ADMINISTRATION

WASHINGTON, D.C. 20204

May 12, 1967

Professor B. L. Shapiro  
 Department of Chemistry  
 Illinois Institute of Technology  
 Technology Center  
 Chicago, Illinois 60616

Dear Barry,

Please include in IITNMRN (LONG MAY IT LIVE!) the following two announcements:

1. Position Available in Instrumentation Section

Qualifications - M.S. or Ph.D. with n.m.r. background (physical or organic). Some knowledge of electronics and computer techniques desirable; at least interest in these areas is important. Applicants for this Civil Service position must be U.S. citizens.

Type of Work

- a) Research initiated by staff members of n.m.r. group and related to problems and substances of current or potential significance to FDA's mission.
- b) Research on organic molecules (structure, rate processes, etc.) originated by other groups working in organic and biological chemistry.
- c) Development of instrumentation, and of instrumental and interpretative techniques.

Publication is encouraged.

Equipment

- a) Available now: HA-100, A-60, and C-1024.
- b) To be built: double-resonance apparatus based on frequency synthesizer (components on order).
- c) Computer facilities: IBM 360-30 (being installed in FDA building; 360-40 available early 1968), access to CDC 3800; search capability for Preston n.m.r. abstract cards.

(over)

-2-

2. Fourier Transform Spectrometry

We should like to explore who is interested in having his high-resolution n.m.r. spectrometer adapted to Fourier transform spectrometry\*. We assume that the present price for such an adaptation may come down substantially, if and when several parties join in approaching Varian on this.

Any steps taken in this direction at this stage by anyone (including us) should and will not imply any commitment whatsoever.

I should appreciate any response from the readers of this newsletter. Please indicate what type of spectrometer is involved.

---

\* A multiple scanning technique which results in considerable saving of time over present slow passage methods. See R.R.Ernst and W.A.Anderson, Rev.Sci.Instr. 37.93 (1966).

Best regards.

Sincerely yours,

*Ernest*

Ernest Lustig  
Division of Food Chemistry  
Bureau of Science

*University of Durham*

CHEMISTRY DEPARTMENT.

SOUTH ROAD,

DURHAM CITY.

TELEPHONE DURHAM 3540-9

Digitized by the Internet Archive in cooperation with the University of Durham  
10th May, 1967.

Professor B.L. Shapiro,  
Department of Chemistry,  
Illinois Institute of Technology,  
Chicago, 60616,  
U.S.A.

Dear Harry,

Your subscription demand letter caught me in one of those periods when it is very difficult to write of anything which would interest a wide audience. I have computer programs which are about to produce interesting results, but which have not done so yet, hence I wonder if I can get away with an appeal for other people to tell me what they are doing? I am writing a review on fluorine chemical shifts together with Laurie Phillips of Imperial College, and I would very much appreciate any preprints or chemical shift data which is in the process of publication. We are particularly interested in attempts to calculate chemical shifts, and studies of medium effects (including complex formation) of fluorine ... R.

Instrumentation and Instrumental and Post-war, 1945-1965.

Publication is encouraged.

— Jim Emsley.

- a) Available now: IBM 360-35.
- b) To be built: double-resonance apparatus based on Frequency Synthesizer (programmable counter).
- c) Computer facilities: IBM 360-35 (being installed in E.D.A. building; 360-8 available early 1968), access to CDC 3600; search capability for Preston N.M.R. abstract words.

MELLON INSTITUTE  
BIBLIOGRAPHY

"Thiophene Analogues of Indenes. II. The Synthesis, Tautomerism, and Metalation of the Thiophene Analogues of 2-Methylindene"  
O. Meth-Cohn and Salo Gronowitz  
Acta Chem. Scand. 20, 1733 (1966)

"The Reactions of Lignin During Sulphate Cooking. Part X. Synthesis and Alkaline Treatment of Model Compounds Representing Intermediary Episulphide Structures"  
J. Gierer, and L.-A. Smedman  
Acta Chem. Scand. 20, 1769 (1966)

"Synthesis of Potential Radioprotective Compounds. I. Studies on the Reaction Between 2-Methylaziridine, 1-Amino-3-chloro-2-propanol, 3-Amino-2-bromo-1-propanol and the Phosphorothioate Ion Including Structural Investigations of the Compounds Formed"  
S. Åkerfeldt  
Acta Chem. Scand. 20, 1783 (1966)

"Carotenoids of Flexibacteria. III. The Structures of Flexixanthin and Deoxy-flexixanthin"  
A. J. Aasen, and S. L. Jensen  
Acta Chem. Scand. 20, 1970 (1966)

"Silylation as a Method for Establishment of Tertiary Hydroxyl Groups in Carotenoids"  
A. McCormick and S. L. Jensen  
Acta Chem. Scand. 20, 1989 (1966)

"Studies on Orchidaceae Alkaloids V. A New Alkaloid from Phalaenopsis amabilis Bl."  
B. Luning, H. Trankner and S. Brandange  
Acta. Chem. Scand. 20, 2011 (1966)

"NMR-Studies of the Solubilisation of Aromatic Compounds in Cetyltrimethylammonium Bromide Solution II"  
J. C. Eriksson and G. Gillberg  
Acta Chem. Scand. 20, 2019 (1966)

"Synthesis and Reactions of 2-Cyclopenten-1-ylmagnesium Chloride"  
S. Branner-Jørgensen and A. Berg  
Acta. Chem. Scand. 20, 2192 (1966)

"Fungus Pigments. XVIII. The Structure of "Dihydro-isothelophoric Acid Hexaacetate"  
J. Gripenberg and M. Lounasmaa  
Acta Chem. Scand. 20, 2202 (1966)

"Oxidation of Some 2,4,6-Trialkyl-substituted Phenols with Potassium Nitrosodisulfonate. Part II"  
R. Magnusson  
Acta Chem. Scand. 20, 2211 (1966)

"NMR-measurements on  $^{81}\text{Br}^-$ -Counterions in Micellar Solutions"  
J. C. Eriksson and A. Johansson  
Acta Chem. Scand. 20, 2301 (1966)

"Sur la Structure d'un Dérivé Acétyle de la Phlébiarubrone"  
M. Lounasmaa  
Acta Chem. Scand. 20, 2304 (1966)

"Studies of Isobenzothiophenes. I. On the Structure of the Products Formed from 2-Aryl-4,4-diphenyl-1,3-oxathiolan-5-one and Concentrated"  
C. Th. Pedersen  
Acta Chem. Scand. 20, 2314 (1966)

"A Disaccharide Dibenzooate from Daviesia latifolia"  
B. Hansson, I. Johansson and B. Lindberg  
Acta Chemica Scandinavica 20, 2358 (1966)

"Photochemical Studies. V. The Photochemistry of Some 2-Methyl Substituted Quinoline N-Oxides"  
O. Buchardt, J. Becher and C. Lohse  
Acta Chem. Scand. 20, 2467 (1966)

"Constituents of Umbelliferous Plants. VIII. Coumarins from the Root of Seseli libanotis (L.) Koch. The Structure of Three New Coumarins"  
J. Lemmich, E. Lemmich and B. Eichstedt Nielsen  
Acta. Chem. Scand. 20, 2497 (1966)

"The Signs of the Methyl-Methyl Spin Couplings in 2,3-Dimethylthiophene, 2,3-Dimethylfuran, and 3-Iodo-2,5-dimethylfuran"  
S. Rodmar, B. Rodman, A. Ali Khan, S. Gronowitz, and V. Pavulans  
Acta Chem. Scand. 20, 2515 (1966)

"Proton Magnetic Resonance Spectra of Thiazoles. Chemical Shifts and Substituent Effects"  
G. Borgen and S. Gronowitz, R. Dahlbom and B. Holmberg  
Acta Chem. Scand. 20, 2593 (1966)

"Preliminary IR and NMR Investigations on the Alkali Soap-Carboxylic Acid-Water Systems"  
S. Friberg, L. Mandell and P. Ekwall  
Acta. Chem. Scand. 20, 2632 (1966)

"Determination of the Position of the Xanthate Groups in Glucopyranosides by Means of Nuclear Magnetic Resonance. Part I. Position of the Xanthate Group in Mono-S-methyl Xanthates of Methyl D-Glucopyranosides"  
S. Forsen, P. J. Garegg, B. Lindberg and E. Pettersson  
Acta Chem. Scand. 20, 2763 (1966)

" $\alpha$ ,  $\gamma$ , and  $\epsilon$ -Murolene, Major Sesquiterpenes of the Wood of Pinus silvestris L. and of Swedish Sulphate Turpentine"  
L. Westfelt  
Acta Chem. Scand. 20, 2852 (1966)

"Die NMR-Spektren einiger schwefelhaltigen Essig- und  $\alpha$ -Propionsäurederivate"  
M. Brink  
Acta Chem. Scand. 20, 2882 (1966)

"Carbamylphosphonates and Related Compounds—Nuclear-Magnetic-Resonance and Infrared Spectra"  
T. H. Siddall, III and C. A. Prohaska  
Appl. Spectros. 21, 9 (1967)

"Microcells for Nuclear-Magnetic-Resonance Spectroscopy"  
S. C. Slaymaker  
Appl. Spectros. 21, 42 (1967)

"Octahedral Cobalt Complexes in Dipolar Aprotic Solvents"  
VIII. The Proton Magnetic Resonance Spectra of Some Octahedral *cis*- and *trans*-Bisethylenediaminecobalt(III) Isomers in NN-Dimethyl-Formamide, NN-Dimethylacetamide, and Dimethyl Sulphoxide"  
I. R. Lantzke and D. W. Watts  
Australian J. Chem. 20, 35 (1967)

"Transition Metal Complexes of Substituted Alkynes. I. 3,3,3-Trifluoropropyne Complexes of Iron and Cobalt"  
R. S. Dickson and D. B. W. Yawney  
Australian J. Chem. 20, 77 (1967)

"The Structure of the Alkali Fusion Product Derived from Maesopsis. The Evidence Based on Mass Spectrometry and N.M.R. Spectroscopy"  
J. H. Bowie and J. W. W. Morgan  
Australian J. Chem. 20, 117 (1967)

"The Base Catalysed Reaction of Acetylacetone and Acrylate Esters"  
R. Chong and P. S. Clezy  
Australian J. Chem. 20, 123 (1967)

"The Vlene Isomerization of 9,10-Diphenyl-1,2,3,4-Tetrahydro-2,1,4-Ethylylidene-naphthalene"  
W. H. F. Sasse and P. J. Collin  
Australian J. Chem. 20, 131 (1967)

"Studies on tert-Butyl Derivatives of D-Glucose"  
A. N. de Belder, E. J. Bourne, and H. Weigel  
Carbohydrate Res. 3, 1 (1966)

"Der Nachweis des freien Diphenylnitrilimins als Zwischenstufe bei Cycloadditionen"  
J. S. Clovis, A. Eckell, R. Huisgen und R. Sustmann  
Chem. Ber. 100, 60 (1967)

"Ketone durch basenkatalysierte Autoxydation von Aldehyden"  
W. Sucrow  
Chem. Ber. 100, 259 (1967)

"Studies on the Products Obtained by the Periodate Oxidation of Osazones"  
H. El. Khadem and M. M. A. Abdel Rahman  
Carbohydrate Res. 3, 25 (1966)

"Monosaccharide mit Stickstoffhaltigem Ring"  
H. Paulsen und F. Leupold  
Carbohydrate Res. 3, 47 (1966)

"Graded, Acid Hydrolysis of Some O-Isopropylidene Derivatives (Including  $\beta$ -erythro-Ketals) of Carbohydrates"  
J. S. Brimacombe, A. B. Foster and L. C. N. Tucker  
Carbohydrate Res. 3, 76 (1966)

"The Reaction of Unsaturated Carbohydrates with Carbon Monoxide and Hydrogen. Part VI. Structure and Stereochemistry of the Major Anhydroheptitols from tetra-O-acetyl-1-deoxy-D-arabino (and D-lyxo)-hex-1-enopyranose"  
A. Rosenthal and D. Abson  
Carbohydrate Res. 3, 112 (1966)

"Nucleosides. XXXIV. 1-(2,3,5-Tri-O-trityl- $\beta$ -D-ribosyl)uracil (2',3',5'-tri-O-trityluridine)"  
J. F. Codington and J. J. Fox  
Carbohydrate Res. 3, 124 (1966)

"A New Route to 3-deoxy-3-fluoro-D-glucose"  
K. W. Buck, A. B. Foster, R. Hems, and J. M. Webber  
Carbohydrate Res. 3, 137 (1966)

"Sterioide aus Hyodesoycholsäure; Über den Seitenkettenabbau einer 6 $\beta$ . 19-Epoxy-cholansäure"  
R. Zepter, H. Rosenberger, K. Barnikol-Oettler, H. Greiner und F. W. Kunstmüller  
Chem. Ber. 100, 9 (1967)

"C- und O-Methylierung von Phenanthrenhydrochinon durch quartäre Methylgruppen von Hydronaphthalinen bei deren Dehydrierung mit Phenanthrenchinon"  
H. Dammenberg und H.-H. Keller  
Chem. Ber. 100, 23 (1967)

"Eine einfache Benzo[a]chinolin-Synthese. Zugleich eine Modellreaktion für die Alkaloid-Biogenese?"  
H.-J. Teuber und D. Laudien  
Chem. Ber. 100, 35 (1967)

"Über zwei neue Isobutylamide aus Chrysanthemum frutescens L."  
F. Bohlmann und G. Zdero  
Chem. Ber. 100, 104 (1967)

"Umsetzungen reaktionsfähiger Acetylenverbindungen mit Schwefelverbindungen"  
F. Bohlmann and E. Bresinsky  
Chem. Ber. 100, 107 (1967)

"Thermische Umlagerung von cis-Bicyclo[6.1.0]nonatrien-(2,4,6)-molybdäntricarbonyl"  
W. Grimmel  
Chem. Ber. 100, 113 (1967)

"Synthese und Hydrierung von Triasteran, Tetracyclo[3.3.1.  
0<sup>2,8</sup>.0<sup>4,6</sup>]nonan"  
H. Musso und U. Biethan  
Chem. Ber. 100, 119 (1967)

"Stabile Phenoxy-Kationen aus arylierten Phenolen"  
K. Dimroth, W. Umbach und H. Thomas  
Chem. Ber. 100, 132 (1967)

"Diaziridin-Hydrazon-Umlagerung bei acylierten Diaziridinen"  
E. Schmitz, D. Habisch und C. Gründemann  
Chem. Ber. 100, 142 (1967)

"Isolierung des Guajacylglycerins und seines dimeren  $\beta$ -Arylathers aus Fichtenlignin"  
H. Nimz  
Chem. Ber. 100, 181 (1967)

"Umsetzungen von Polynitroaromaten mit Phloroglucin in alkalischer Lösung, III"  
T. Severin und M. Bohn  
Chem. Ber. 100, 211 (1967)

"Photosensibilisierte C<sub>4</sub>-Cycloadditionen mit Vinyl-encarbonat"  
W. Hartmann und R. Steinmetz  
Chem. Ber. 100, 217 (1967)

"Zsynthese und Eigenschaften von Hexa-m-phenylen und Octa-m-phenylen"  
H. A. Staab und F. Binnig  
Chem. Ber. 100, 293 (1967)

"Reaktionen des Dianhydrids der Methylentetracarbonsäure (C<sub>6</sub>O<sub>6</sub>)"  
J. Sauer, B. Schröder und A. Mielert  
Chem. Ber. 100, 315 (1967)

"Scutianin, ein cyclisches Peptid-Alkaloid aus Scutia buxifolia Reiss"  
R. Tschesche, R. Welters und H.-W. Fehlhaber  
Chem. Ber. 100, 323 (1967)

"Intramolekular Beweglichkeit von Azepinen und Diazepinen"  
A. Mannschreck, G. Rissmann, F. Wörgle und D. Wild  
Chem. Ber. 100, 335 (1967)

"Chlorolyse verzweigter Kohlenwasserstoff"  
H. Höver  
Chem. Ber. 100, 456 (1967)

"Synthese von 12 $\alpha$ .20R-Epoxy-5 $\alpha$ .14 $\beta$ .17 $\beta$ H-pregnananen"  
R. Tschesche und E. Schwinum  
Chem. Ber. 100, 464 (1967)

"Darstellung und Eigenschaften von Chlorfluormethyl-sulfenylpseudohalogeniden"  
A. Haas und D.-Y. Oh  
Chem. Ber. 100, 480 (1967)

"Polyine aus dem Tribus Helenieae"  
F. Bohlmann, K.-M. Rode und G. Zdero  
Chem. Ber. 100, 537 (1967)

"Über die Addition von Hexadienon an Dehydrochinolizidin"  
F. Bohlmann, D. Schumann und E. Bauerschmidt  
Chem. Ber. 100, 542 (1967)

"<sup>4</sup><sup>1</sup>-Substituierte 2-Trifluormethyl-4-trifluoracetyl-methylenoxazolidon-(5) und Umwandlungsprodukte"  
W. Steglich und V. Austel  
Chem. Ber. 100, 547 (1967)

"Beiträge zur Chemie der Dithiocarbonsäureester und Ketenmercapte"  
R. Gompper und H. Schaefer  
Chem. Ber. 100, 591 (1967)

"Die Polyne der Gattung Matricaria L."  
F. Bohlmann, H. Mönch und P. Blaszkiewicz  
Chem. Ber. 100, 611 (1967)

"Über Chinole, Chinoläther und Chinolester aus arylierten Phenolen"  
K. Dimroth, H. Perst, K. Schlümer, K. Worschach und K.-H. Müller  
Chem. Ber. 100, 629 (1967)

"4-Phenyl-1,2,4-triazolin-dion-(3,5) als Dienophil"  
J. Sauer und B. Schröder  
Chem. Ber. 100, 678 (1967)

"Die Anlagerung von Thiobenzoylisocyanat an Norbornen und Norbornadien"  
R. Weiß  
Chem. Ber. 100, 685 (1967)

"Notiz über die Darstellung von Tri-tert.-butylphosphin"  
H. Hoffmann und P. Schellenbeck  
Chem. Ber. 100, 692 (1967)

"Notiz über die geometrische Isomerie der  $\Delta^4$ -Cholestenon-(3)-dimitrophenylhydrazone"  
A. K. Sen Gupta  
Chem. Ber. 100, 694 (1967)

"The Structure of  $\alpha$ -Methylstyrene Tetramer"  
M. N. Berger, J. J. K. Boulton, B. W. Brooks, and M. J. Evans  
Chem. Commun. 8 (1967)

"The Structure of Olearin, a Diterpene Dilactone"  
J. T. Pinhey and R. F. Simpson  
Chem. Commun. 9 (1967)

"The Reaction of Cycloheptatriene with Benzoyleum Fluoroborate"  
J. A. Blair, G. P. McLaughlin, and J. Paslawski  
Chem. Commun. 12 (1967)

"The Alkaloids 8,14-Dihydrosalutaridine and 8,14-Dihydro-norsalutaridine from Croton linearis Jacq."  
L. J. Haynes, G. E. M. Husbands and K. L. Stuart  
Chem. Commun. 15 (1967)

"Bis- $\pi$ -allylrhodium Chloride"  
M. McPartlin and R. Mason  
Chem. Commun. 16 (1967)

"The Mechanism of the Anomerisation of the Methyl D-Glucopyranosides"  
B. Capon  
Chem. Commun. 21 (1967)

"Long-range <sup>19</sup>F-H Coupling and Hindered Rotation"  
J. P. N. Brewer, H. Heaney and B. A. Marples  
Chem. Commun. 27 (1967)

Synthesis and Structure of 3-Benzyl-2,6-diphenyl-2H-thiopyran-5-carboxaldehyde"  
S. E. Cremer and A. V. Subbaratnam  
Chem. Commun. 33 (1967)

"The Use of Nuclear Magnetic Double Resonance to Study Reversible Intramolecular Processes"  
I. C. Calder, P. J. Garratt, and F. Sondheimer  
Chem. Commun. 41 (1967)

"The <sup>1</sup>H N.m.r. Spectra of Diamagnetic and Paramagnetic Complexes of Rare-earth Salts with an Aromatic Amine"  
F. A. Hart, J. E. Newberry and D. Shaw  
Chem. Commun. 45 (1967)

"<sup>13</sup>C-<sup>31</sup>P Spin-Spin Coupling in Organophosphorus Compounds"  
W. McFarlane  
Chem. Commun. 58 (1967)

"The Photolysis of Perfluoro-2,3-diazabuta-1,3-diene"  
R. A. Mitsch and P. H. Ogden  
Chem. Commun. 59 (1967)

"The Autoxidation of the Conjugated Triene Side-chain of Ebelin Lactone"  
R. A. Eade, J. Ellis and J. J. H. Simes and J. S. Shannon  
Chem. Commun. 60 (1967)

"Stereoselective Photo-rearrangement of a Pyrroline 1-Oxide"  
J. B. Bapat and D. St. C. Black  
Chem. Commun. 73 (1967)

"The Structure of Entandrophragmin"  
D. A. H. Taylor and K. Wragg  
Chem. Commun. 81 (1967)

"The Structure of Heudelottin, an Extractive from Trichilia heudelottii"  
D. A. Okorie and D. A. H. Taylor  
Chem. Commun. 83 (1967)

"Uncarine C, D (Speciophylline), E, and F: C-3 and C-7 Epimeric Oxindoles related to Tetrahydroalstonine"  
N. K. Hart, S. R. Johns, and J. A. Lamberton  
Chem. Commun. 87 (1967)

"The Synthesis of Antipodal Polyalthic Acid from Levopimamic Acid"  
S. W. Pelletier, L. B. Hawley, Jr., and K. W. Gopinath  
Chem. Commun. 96 (1967)

"Solvation in Aqueous N-Methylacetamide Solutions of Aluminium Chloride: an N.m.r. Study"  
J. F. Hinton and E. S. Amis  
Chem. Commun. 100, (1967)

"3-Methylindenylmagnesium Bromide, a Butenyl Grignard Reagent"  
E. J. Nienhouse  
Chem. Commun. 101 (1967)

"Boron Photochemistry: 1-Phenylcyclohexa-1,4-diene from Sodium Tetraphenylborate"  
J. L. R. Williams, J. C. Doty, P. J. Grisdale, T. H. Regan, and D. G. Borden  
Chem. Commun. 109 (1967)

"A Possible Intermediate in Sesquiterpene Biosynthesis"  
E. D. Brown, M. D. Solomon, J. K. Sutherland and A. Torre  
Chem. Commun. 111 (1967)

"Solvent Effect in the PMR-Spectra of Dehydronorborneols"  
E. Rahkamaa  
Suomen Kemistilehti 39, 272 (1966)

The Structure of Peruvinin—A Pseudoguaianolide Isolated from Ambrosia Peruviana Willd"  
J. Romo, P. Joseph-Nathan, A. Romo de Vivar and C. Alvarez  
Tetrahedron 23, 529 (1967)

"Sulphonium and Oxosulphonium Carbalkoxymethylides"  
H. Nozaki, D. Tunemoto, S. Matubara and K. Kondo  
Tetrahedron 23, 545 (1967)

"Structure and Absolute Configuration of  $\alpha$ -Kessyl Alcohol and Kessyl Glycol"  
S. Ito, M. Kodama and T. Nozoe  
Tetrahedron 23, 553 (1967)

"Stabile Carbenoide—XXI. Oligomere des "Isopropyliden-carbens"  
G. Köbrich, H. Heinemann und W. Zündorf  
Tetrahedron 23, 565 (1967)

"Über den Mechanismus der Wasserstoffübertragung mit Pyridinnukleotiden—XXVIII. Der Zusammenhang Zwischen Bildungsstand in Dihydropyridinen und Elektronenspektroskopischen Daten"  
W. Hanstein und K. Wallenfels  
Tetrahedron 23, 585 (1967)

"Studies of the Elimination of 1,2-Diaryl-4-Dimethyl-aminobutan-2-Ols-II. The Elimination of 1,2-Diphenyl-4-Dimethylaminobutan-2-ol and Related Compounds"  
A. F. Casey and P. Pocha  
Tetrahedron 23, 633 (1967)

"The Reaction of Benzylsulfonyl Halides with Phenyllithium. Preparation of Sulfones"  
Y. Shirota, T. Nagai and N. Tokura  
Tetrahedron 23, 639 (1967)

"The "Bicyclobutonium Ion" Reaction of (1-Methycyclopropyl)Carbinyl and 1-Methylcyclobutyl Methanesulfonates with Sodium Borohydride Under Solvolytic Conditions"  
Z. Majerski, M. Nikolic, S. Borcic and D. E. Sunko  
Tetrahedron 23, 661 (1967)

"cis-1H,4H-Trifluorobuta-1,3-Diene. The Characterisation of a New Conjugated Diene by NMR Spectroscopic Analysis"  
T. N. Huckerby, E. F. Mooney and R. Stephens  
Tetrahedron 23, 709 (1967)

"New Metabolites of Gibberella Fujikuroi—XII. Gibberellin A<sub>15</sub>  
J. R. Hanson  
Tetrahedron 23, 733 (1967)

"The Structure of the Oxidation Product of Pyrrole, C<sub>12</sub>, H<sub>17</sub>N<sub>3</sub>O<sub>3</sub>"  
V. Bocchi, L. Chierici and G. P. Gardini  
Tetrahedron 23, 737 (1967)

"The Protonation of N-Phenylpyrroles"  
Y. Chiang, R. L. Hinman, S. Theodoropoulos and E. B. Whipple  
Tetrahedron 23, 745 (1967)

"Chemical Studies of Marine Invertebrates—II. Terpenoids—LVIII. Griseogenin, A New Triterpenoid Sapogenin of the Sea Cucumber Halodeima Grisea L"  
B. Tursch, I. S. de Souza Guimaraes and B. Gilbert, R. T. A'lin, A. M. Duffield and C. Djerassi  
Tetrahedron 23, 761 (1967)

"Azasteroids—VI. A Facile Total Synthesis of DL-8-Azaestrone Methyl Ether and Related Systems"  
A. I. Meyers and J. C. Sircar  
Tetrahedron 23, 785 (1967)

"The Chemistry of the Tetracyclic Diterpenoids—V. Stereochemical Studies in the Stachene Series"  
J. R. Hanson  
Tetrahedron 23, 793 (1967)

"The Chemistry of the Tetracyclic Diterpenoids—VI. The Stereochemistry of Some Reactions of (—)-Kaurene"  
J. R. Hanson  
Tetrahedron 23, 801 (1967)

"Studies on Bicyclo[3.3.1]Nonanes—II. Transannular Hydride Shifts in Bridged Bicycles"  
R. A. Appleton, J. R. Dixon, J. M. Evans and S. H. Graham  
Tetrahedron 23, 805 (1967)

"Acetylsalicylamide  $\alpha$ - to N-Acetyl Migration"  
A. J. Gordon  
Tetrahedron 23, 863 (1967)

"Thiophene Chemistry—XII. Synthesis and Tautomeric Structure of Acetyl and Carbethoxy Chelated 2-Hydroxy-thiophenes"  
H. J. Jakobsen and S.-O. Lawesson  
Tetrahedron 23, 871 (1967)

"A New Synthesis of Diethyl  $\beta$ -Ketoadipate"  
E. C. Taylor and A. McKillop  
Tetrahedron 23, 897 (1967)

"The Synthesis and Stereochemistry of Some Isatylidene-acetic Acid Derivatives"  
R. L. Autrey and F. C. Tahk  
Tetrahedron 23, 901 (1967)

"Terpenoids—XCIV. Synthesis of Novel Longifolane Derivatives via Oxidation with Lead Tetraacetate"  
S. G. Patnekar and S. C. Bhattacharyya  
Tetrahedron 23, 919 (1967)

"Chemistry of the Podocarpaceae—XII. Oxidation of O-Methylpodocarpic Acid With Lead Tetra-Acetate"  
C. R. Bennett and R. C. Cambie  
Tetrahedron 23, 927 (1967)

"Synthesis of Pyridoxine by Diels-Alder Reactions with 4-Methyl-5-Alkoxy Oxazoles"  
R. A. Firestone, E. E. Harris and W. Reuter  
Tetrahedron 23, 943 (1967)

"Studies on Lactams—VII. A New Synthesis of  $\beta$ -Amino- $\beta$ -Lactams"  
A. K. Bose and I. Kugajevsky  
Tetrahedron 23, 957 (1967)

"Kinetics of the Decomposition of a Phosphorylated Triazoline. Evidence for a Dipolar Ion Intermediate"  
K. D. Berlin, L. A. Wilson and L. M. Raff  
Tetrahedron 23, 965 (1967)

"The Establishment of Double Bond Character in Methyl Derivatives of Phenanthrene, Pyrene, Chrysene and Coronene by NMR"  
E. Clar, B. A. McAndrew and M. Zander  
Tetrahedron 23, 985 (1967)

"Studies on A-Norsteroids—VI. Directing Effects of the C<sub>11</sub>-Substituents on the Addition of Osmium Tetroxide to Steroidal  $\Delta^1,4$ -3-Ketones"  
T. Kubota and F. Hayashi  
Tetrahedron 23, 995 (1967)

"The Absolute Configuration of Paynantheine and Hirsutine"  
W. F. Trager, C. M. Lee, J. D. Phillipson and A. H. Beckett  
Tetrahedron 23, 1043 (1967)

"ERRATE: Geminal Coupling Constants in Methylene Groups"  
R. C. Cookson, T. A. Crabb, J. J. Frankel and J. Hudec  
Tetrahedron 23, 1055 (1967)

The IIT NMR Newsletter will continue unchanged, at least for the next several months. Those recipients (academic as well as industrial, research institutes, government labs, etc.) who might be able to help out with a contribution toward the costs of the Newsletter are encouraged to consider the possibility of doing so at some time in the not-too-distant future.

B. L. Shapiro

29 May 1967

"The Nuclear Magnetic Resonance Spectra of Some Related Alkylene-Substituted Diethylamines"  
M. Freifelder, R. W. Mattoon and R. Kriese  
Can. J. Chem. 45, 21 (1967)

"The Examination of Lobinaline and Some Degradation Products by Mass Spectrometry"  
D. M. Clugston and D. B. MacLean and R. H. F. Manske  
Can. J. Chem. 45, 39 (1967)

"Dimerization of an Intermediate During the Sodium in Liquid Ammonia Reduction of L-Thiazolidine-4-Carboxylic Acid"  
P. Blondeau, C. Berse, and D. Gravel  
Can. J. Chem. 45, 49 (1967)

"Photochemistry of Nitroso Compounds in Solution. V. Photolysis of N-Nitrosodialkylamines"  
Y. L. Chow  
Can. J. Chem. 45, 53 (1967)

"Synthesis of Some Disubstituted Naphthazarins"  
P. C. Arora and P. Brassard  
Can. J. Chem. 45, 67 (1967)

"Glutamic Acid Analogues. The Synthesis and Identification of 4-Isopropyl-3,5-Dicarbethoxy-2-Pyrrolidinone"  
Y. C. Kim and G. H. Coccolas  
Can. J. Chem. 45, 83 (1967)

"The Reaction of all-cis Cyclopentanetetracarboxylic Acid Dianhydride with Primary Amines"  
R. P. Mariella and R. A. Blau  
Can. J. Chem. 45, 85 (1967)

"Alkaloids of Aspidosperma vargasii A. DC."  
R. H. Burnell and D. D. Casa  
Can. J. Chem. 45, 89 (1967)

"The Radiation Chemistry of Dihydromyrcene"  
J. L. Brash and M. A. Golub  
Can. J. Chem. 45, 101 (1967)

"Charge Distribution in Substituted Cyclopentadienyl-manganese-tricarbonyl Compounds"  
C. Barbeau  
Can. J. Chem. 45, 161 (1967)

"Kinetics and Mechanism of Bromination of Styrenes"  
K. Yates and W. V. Wright  
Can. J. Chem. 45, 167 (1967)

"Nuclear Magnetic Resonance Studies. X. Determination of the Thermodynamic Parameters of the Self-Association of Tricyclic Aromatic Aldehydes in Solution"  
Gurudata, R. E. Klinck, and J. B. Stothers  
Can. J. Chem. 45, 213 (1967)

"Etude Quantitative des Réactions d'ozonolyse. IV. Ozonation de l'indène"  
S. Fliszár, Cz. Belzecki et J. B. Chylińska  
Can. J. Chem. 45, 221 (1967)

"<sup>13</sup>C n.m.r. Studies. IX. Carbonyl Carbon Shieldings of Some Cyclopropyl Ketones"  
D. H. Marr and J. B. Stothers  
Can. J. Chem. 45, 225 (1967)

"<sup>13</sup>C n.m.r. Studies. X. <sup>13</sup>C Spectra of Some Substituted Methyl Benzoates"  
K. S. Dhami and J. B. Stothers  
Can. J. Chem. 45, 233 (1967)

Mechanism of the  $\alpha$ -Silylcarbinol to Silyl Ether Rearrangement"  
A. G. Brook, G. E. LeGrow, and D. M. MacRae  
Can. J. Chem. 45, 239 (1967)

"A New Synthesis of Twistane"  
J. Gauthier, and P. Deslongchamps  
Can. J. Chem. 45, 297 (1967)

"Lignans of Western Red Cedar (Thuja plicata Donn). VI. Dihydroxythujaplicatin Methyl Ether"  
H. MacLean and K. Murakami  
Can. J. Chem. 45, 305 (1967)

"Natural Coumarins. VI. Nuclear Magnetic Resonance Spectra of Some Coumarin and Coumarilic Acid Derivatives"  
E. A. Abu-Mustafa and M. B. E. Fayez  
Can. J. Chem. 45, 325 (1967)

"Fully Fluorinated Alkoxides. Part II. Ethoxides, Propoxides, and Butoxides"  
M. E. Redwood and C. J. Willis  
Can. J. Chem. 45, 389 (1967)

"Proton Magnetic Resonance Study of Water as Hydrogen Donor to N,N-dimethylformamide and Dimethyl Sulfoxide"  
S. F. Ting, S. M. Wang, and N. C. Li  
Can. J. Chem. 45, 425 (1967)

"The Alkaloids of Lycopodium cernuum L. I. The Structures of cernuine and Lycocernuine"  
W. A. Ayer, J. K. Jenkins, and S. Valverde-Lopez  
Can. J. Chem. 45, 433 (1967)

"The Alkaloids of Lycopodium cernuum L. II. The Stereochemistry of cernuine and lycocernuine"  
W. A. Ayer, J. K. Jenkins, K. Piers, and S. Valverde-Lopez  
Can. J. Chem. 45, 445 (1967)

"The Alkaloids of Lycopodium cernuum L. III. The Synthesis of Dihydrodeoxyepiallocernuine"  
W. A. Ayer and K. Piers  
Can. J. Chem. 45, 451 (1967)

"Pyrazolines. VII. Concerning the Formation of Olefins From the Pyrolysis of Pyrazolines"  
D. E. McGreer and W.-S. Wu  
Can. J. Chem. 45, 461 (1967)

"The Synthesis of 1 $\alpha$ -Methylcortisone and 1 $\alpha$ -Methylhydrocortisone"  
M. Tanabe and D. F. Crowe  
Can. J. Chem. 45, 475 (1967)

"Reductive Cleavage with Metal in Liquid Ammonia. II. Olefin Formation in Attempts at Selective Cleavage of Methyl S-benzyl-4,6-O-benzylidene-3-O-methyl-2-thio- $\alpha$ -D-Altropyranoside and its S-methyl analogue by Sodium Metal in Liquid Ammonia Dilute with 1,2-Dimethoxyethane"  
U. G. Nayak, M. Sharma, and R. K. Brown  
Can. J. Chem. 45, 481 (1967)

"The Selective Phosphylation of Ethanolamine"  
R. Greenhalgh and M. A. Weinberger  
Can. J. Chem. 45, 495 (1967)

"Structural Biochemistry. IV. 3 $\beta$ -Hydroxy-17 $\beta$ -(L-prolyl) amino-androst-5-ene"  
G. R. Pettit, R. L. Smith, A. K. Das Gupta, and J. L. Occolowitz  
Can. J. Chem. 45, 501 (1967)

"Configuration of Pyruvic Acid Ketals, 4,6-O-Linked to D-Galactose Units, in Bacterial and Algal Polysaccharides"  
P. A. J. Gorin and T. Ishikawa  
Can. J. Chem. 45, 521 (1967)

"Rhodium(I) and Iridium(I) Carbonyl Derivatives of Some Schiff Bases of Acetylacetone"  
F. Bonati and R. Ugo  
*J. Organometal. Chem.* 7, 167 (1967)

"Acetato-Bridged Acetoxy- and Methoxy-Palladium Adducts of 1,5-Cyclooctadiene"  
C. B. Anderson and B. J. Burreson  
*J. Organometal. Chem.* 7, 181 (1967)

"Medicinal Chemistry of the Mesoionic Compounds"  
L. B. Kier and E. B. Roche  
*J. Pharm. Sci.* 56, 149 (1967)

"Isolation of Cantharidin from Epicauta pestifera"  
W. G. Walter and J. F. Cole  
*J. Pharm. Sci.* 56, 174 (1967)

"Coumarins IV. Coumarins of Pteryxia terebinthina. Structures of Two New Coumarins, Isopteryxin and Calipteryxin"  
B. E. Nielsen and T. O. Soine  
*J. Pharm. Sci.* 56, 184 (1967)

"NMR Spin-Spin Decoupling Studies of Some 5,6-Disubstituted Bicyclo[2.2.2]oct-2-enes"  
D. B. Roll, B. J. Nist, and A. C. Huitric  
*J. Pharm. Sci.* 56, 212 (1967)

"3-Thenyl Nitrogen Mustards"  
W. Lewis Nobles and C. M. Darling  
*J. Pharm. Sci.* 56, 288 (1967)

"Signs of Spin Densities and Vibronic Interactions in 1- and 1,4-Alkyl-Substituted Benzene Anions"  
E. de Boer and J. P. Colpa  
*J. Phys. Chem.* 71, 21 (1967)

"Polymer Nuclear Magnetic Resonance Spectroscopy. XII. The Stereoregularity of Polyvinyl Chloride and Its Dependence on Polymerization Temperature"  
F. A. Bovey, F. P. Hood, E. W. Anderson and R. L. Kornegay  
*J. Phys. Chem.* 71, 312 (1967)

"The Proton Magnetic Resonance Spectra of Ammonia Nickel Cyanide Clathrates"  
K. Umemoto and S. S. Danyluk  
*J. Phys. Chem.* 71, 450 (1967)

"Rates and Solvent Participation in Acid-Base Reactions of Substituted Phenols and Phenoxides in Methanol"  
E. Grunwald, C. F. Jumper, and M. S. Puar  
*J. Phys. Chem.* 71, 492 (1967)

"Proton Chemical Shifts and Hydrogen Bonding in the Ternary System Carbon Tetrachloride-Dioxane-Water"  
N. Muller and P. Simon  
*J. Phys. Chem.* 71, 568 (1967)

"Proton Resonance Spectra of Selected Mono-, Di-, and Trisubstituted Silanes"  
H. J. Campbell-Ferguson, E. A. V. Ebsworth, A. G. MacDiarmid, and T. Yoshioka  
*J. Phys. Chem.* 71, 723 (1967)

"Etude par Resonance Magnetique Nucleaire des Fonctions D'Onde des Molecules D'Hydrogene et D'Hydrogene Deutere Adsorbees a Basse Temperature"  
P. Monod, J. A. Cowen et W. N. Hardy  
*J. Phys. Chem. Solids* 27, 727 (1966)

"Resonance Magnetique Nucleaire Dans le Rubidium et le Cesium Metalliques"  
J. Poitrenaud  
*J. Phys. Chem. Solids* 28, 161 (1967)

"Fluoroine Nuclear Magnetic Resonance in Dilute Paramagnetic Spinels with Fluorine Charge Compensation"  
A. Sobel  
*J. Phys. Chem. Solids* 28, 185 (1967)

"Etude par la R.M.N., Entre -30°C et +20°C, du Mouvement de Rotation des Molecules d'Eau Adsorbées par L'Edingtonite Naturelle"  
J. P. Cohen-Addad, et M. Chelouche  
*J. Phys. Radium* 27, 570 (1966)

"Lability of the  $\alpha$ -Hydrogen in Polyacrylonitrile"  
W. L. Hunter  
*J. Polymer Sci., Pt. B, Polymer Letters* 5, 23 (1967)

"Stereospecific Polymerizations of 2,3-Epoxy and 2,3-Epithiopropyl Methacrylates"  
Y. Iwakura, F. Toda, T. Ito, and K. Aoshima  
*J. Polymer Sci., Pt. B, Polymer Letters* 5, 29 (1967)

"NMR Spectra of Poly(Vinyl Acetate) and Poly(Vinyl Alcohol)"  
K. C. Ramey and D. C. Lini  
*J. Polymer Sci., Pt. B, Polymer Letters* 5, 39 (1967)

"Nuclear Magnetic Resonance and Electron Structure of Uranium, Thorium, and Zirconium Tetrafluorides"  
S. P. Gabuda, Yu. V. Gagarinskii, and A. G. Lundin  
*J. Struct. Chem. USSR (English Transl.)* 7, 192 (1966)

"Mechanism of Spin-Spin and Spin-Lattice Relaxation in Complex Compounds of Antimony Trichloride"  
V. S. Grechishkin and A. D. Gordeev  
*J. Struct. Chem. USSR (English Transl.)* 7, 203 (1966)

"The  $^1\text{H}$  NMR Spectrum of Methylchloromethyldivinyloxysilane"  
P. V. Petrovskii, E. I. Fedin, L. Braier, I. K. Shmyrev and A. D. Donner  
*J. Struct. Chem. USSR (English Transl.)* 7, 267 (1966)

"Studies on the Polymerization of Bifunctional Monomers. XI. The Cyclic Polymerization of Divinyl Ether and the Structure of the Polymers"  
C. Asa, S. Ushio, and M. Sogabe  
*Makromol. Chem.* 100, 100 (1967)

"Determination of the Relative Signs of Spin Coupling Constants from the Temperature Dependence of N.M.R. Spectra."  
J. H-C-C=CH"  
R. Freeman  
*Mol. Phys.* 11, 505 (1966)

"The Limitations of Generalization in Sub-Spectral Analysis of N.M.R. Spectra"  
P. Diehl and D. Trautmann  
*Mol. Phys.* 11, 531 (1966)

" $^{14}\text{N}$  Chemical Shifts in Primary and Secondary Amides"  
P. Hampson and A. Mathias  
*Mol. Phys.* 11, 541 (1966)

"Proton Magnetic Relaxation in Dilute Solutions of Paramagnetic Ions"  
H. Pfeifer, D. Michel, D. Sames and H. Sprinz  
*Mol. Phys.* 11, 591 (1966)

"An N.M.R. Study of N,N-dimethylformamide Complexes"  
A. Fratiello, R. Schuster and D. P. Miller  
*Mol. Phys.* 11, 597 (1966)

"A Simple Formula for Some Nuclear Spin-Spin Coupling Constants"  
W. T. Dixon  
*Mol. Phys.* 11, 601 (1966)

"Anthocyanidins and Related Compounds—XI. Catechin-Flavylium Salt Condensation Reactions"  
L. Jurd  
*Tetrahedron* 23, 1057 (1967)

"Structural Studies by Nuclear Magnetic Resonance—XI. Conformations and Configurations of Oxime o-Methyl Ethers"  
G. J. Karabatsos and N. Hsi  
*Tetrahedron* 23, 1079 (1967)

"Structural Studies by Nuclear Magnetic Resonance—XII. Conformations and Configurations of N-Methylphenyl-hydrazones"  
G. J. Karabatsos and K. L. Krumel  
*Tetrahedron* 23, 1097 (1967)

"Chemistry of Gem-Dihalocyclopropanes—VI. A Novel Synthesis of Cyclopentadienes and Fulvenes"  
L. Skattebøl  
*Tetrahedron* 23, 1107 (1967)

"Favorskii Rearrangement of the Fulegone Epoxides"  
C. W. K. Cavill and C. D. Hall  
*Tetrahedron* 23, 1119 (1967)

"Studies on Argentine Plants—XXII. Heliettin, A New Furocoumarin from Helietta Longifoliata Britt"  
H. Pozzi, E. Sanchez, and J. Comin  
*Tetrahedron* 23, 1129 (1967)

"Studies on Argentine Plants—XXIII. Quaternary Bases from Colletia Spinosissima Gmel"  
E. Sanchez and J. Comin  
*Tetrahedron* 23, 1139 (1967)

"Reactions of Halogenated Acrylonitrile Derivatives with Arylsulfinate Salts. A Novel Chain Shortening Reaction"  
B. Miller and M. V. Kalnins  
*Tetrahedron* 23, 1145 (1967)

"The Total Synthesis of Securinine and Virosecurinine"  
Z. Horii, M. Hanaoka, Y. Yamawaki and Y. Tamura, S. Saito, N. Shigematsu, K. Kotera, H. Yoshikawa, Y. Sato, H. Nakai and N. Sugimoto  
*Tetrahedron* 23, 1165 (1967)

"Interconversion between Hibaene and Kaurene"  
A. Yoshikoshi, M. Kitadani and Y. Kitahara  
*Tetrahedron* 23, 1175 (1967)

"5,6-Dibromoprotocatechualdehyde and 2,3-Dibromo-4,5-Dihydroxybenzyl Methyl Ether. New Dibromophenols from Rhodomela Larix"  
N. Katsui, Y. Suzuki, S. Kitamura and T. Irie  
*Tetrahedron* 23, 1185 (1967)

"The Proton Magnetic Resonance Spectra and the Structure of 4,6-Dihydroxypyrimidine and its Derivatives"  
G. M. Kheifets, N. V. Khromov-Borisov, A. I. Koltsov and M. V. Volkenstein  
*Tetrahedron* 23, 1197 (1967)

"Pentacyclodecane Chemistry—II. Some Reactions of Dodecachloropentacyclo[5.3.0.0<sup>2,6</sup>.0<sup>3,9</sup>.0<sup>4,8</sup>]Decane and Related Compounds"  
W. L. Dilling, H. P. Braendlin and E. T. McBee  
*Tetrahedron* 23, 1211 (1967)

"Pentacyclodecane Chemistry—III. Fragmentation Patterns of Pentacyclodecane Derivatives on Electron Impact"  
W. L. Dilling and M. L. Dilling  
*Tetrahedron* 23, 1225 (1967)

"Terpenoids—XCV. Synthesis of ( $\pm$ )-cis-Suksdorfin and Related Products from Jatamansinone"  
S. N. Shanbhag, M. L. Maheshwari and S. C. Bhattacharyya  
*Tetrahedron* 23, 1235 (1967)

"Terpenoids—XCVI. Dehydration Reaction of Guaiol and Dihydroguaiol and Transformation of  $1\alpha,5\alpha$ -Dihydroguaiol to  $1\alpha,5\alpha$ -Hexahydrodehydrocostus Lactone"  
M. V. Kadival, M. S. R. Nair and S. C. Bhattacharyya  
*Tetrahedron* 23, 1241 (1967)

"Terpenoids—XCVII. Base Catalysed Reactions with N-Lithioethylenediamine"  
B. N. Joshi, K. K. Chakravarti and S. C. Bhattacharyya  
*Tetrahedron* 23, 1251 (1967)

"Terpenoids—XCVIII. Synthesis of ( $\pm$ ) 4-Demethyldihydro-eudesmol and ( $\pm$ )-trans- $5\alpha,9\beta$ -Dimethyl-2-Decalone"  
R. K. Mathur and A. S. Rao  
*Tetrahedron* 23, 1259 (1967)

"Terpenoids—XCIX. Structure and Absolute Configuration of Khisinoloxide, a New Antipodal Sesquiterpene Epoxy Alcohol from Vetiver Oil"  
R. Seshadri, P. S. Kalsi, K. K. Chakravarti and S. C. Bhattacharyya  
*Tetrahedron* 23, 1267 (1967)

"Sterols and Triterpenoids—XI. Isolation of Arundoin and Sawamilletin from Cuban Sugar Cane Wax"  
T. A. Bryce, M. Martin-Smith, G. Osske, K. Schreiber and G. Subramanian  
*Tetrahedron* 23, 1283 (1967)

" $4\beta$ -Chloroethylaminopyrimidines and the Formation of Imidazolidino[1.2-c]Pyrimidines on Acid Treatment of 4-Bis-]-Hydroxyethylaminopyrimidines"  
K. L. Nagpal and M. M. Dhar  
*Tetrahedron* 23, 1297 (1967)

"Natural Coumarins—VII. The Constitution of Some Coumarin and Coumarilic Acid Derivatives"  
E. A. Abu-Mustafa and M. B. E. Fayez  
*Tetrahedron* 23, 1305 (1967)

"The Reaction of Cyanohydrins with  $\alpha,\beta$ -Unsaturated Aldehydes"  
L. A. Yanovskaya, Ch. Shachidayatov and V. F. Kutcherov  
*Tetrahedron* 23, 1311 (1967)

"Aromatic Polyfluoro Compounds—XXXVI. The Reactions of 2-Substituted-Tetrafluoronitrobenzenes with Nucleophiles"  
J. Burdon, D. R. King and J. C. Tatlow  
*Tetrahedron* 23, 1347 (1967)

"Selective Acylation of Pyranosides—I. Benzoylation of Methyl  $\alpha$ -D-Glycopyranosides of Mannose, Glucose and Galactose"  
J. M. Williams and (in part) A. C. Richardson  
*Tetrahedron* 23, 1369 (1967)

"Synthese von Aminobiopterin und Aminoneopterin"  
H. Rembold and J. Eder  
*Tetrahedron* 23, 1387 (1967)

"1-(3-Methyl-2-Indolyl)Pyridinium Bromide Synthesis and Auto-Oxidation of its Catalytic Hydrogenation Product"  
T. Hino and M. Nakagawa, T. Wakatsuki, K. Ogawa and S. Yamada  
*Tetrahedron* 23, 1441 (1967)

"Structures and Stereochemistry of Clivonine and Clivimine"  
W. Dopke and M. Bienert, A. L. Burlingame and H. K. Schnoes  
P. W. Jeffs and D. S. Farrier  
*Tetrahedron Letters* 451 (1967)

"Vinylamines—VII. More Substituted Alkylated Enamines from Cyclohexanone Enamines and Phenyl Vinyl Sulfone"  
A. Risaliti, S. Fatutta and M. Forchiassini  
*Tetrahedron* 23, 1451 (1967)

"Digitanolglykoside—XVI. Die Struktur der Kondurangogenine A und C"  
R. Tschesche, H. Kohl und P. Welzel  
*Tetrahedron* 23, 1461 (1967)

"Reactions of Dichlorocarbene and Trichloromethide with 0-Alkenyl Esters and Ethers, N-Vinyl Amides, and 1-Haloalkenes"  
R. C. De Selms and T.-W. Lin  
*Tetrahedron* 23, 1479 (1967)

"NMR Spectral Studies—IV. Some  $^{15}\text{N}-\text{H}$  Coupling Constants"  
A. K. Bose and I. Kugajevsky  
*Tetrahedron* 23, 1489 (1967)

"Modified Steroid Hormones—XLVII. Some Further Pentacyclic Types"  
J. M. Allison, D. Burn, F. K. Butcher, M. T. Davies and V. Petrow  
*Tetrahedron* 23, 1515 (1967)

"Diene Studies. V. Structures of and Rotation Barriers in Pentadienyllithiums"  
R. B. Bates, D. W. Gosselink and J. A. Kaczynski  
*Tetrahedron Letters* 205 (1967)

"The Structure of Ryanodine"  
K. Wiesner, Z. Valenta and J. A. Findlay  
*Tetrahedron Letters* 221 (1967)

"Photochemistry of Zerumbone"  
H. N. Subba Rao, N. P. Damodaran and S. Dev  
*Tetrahedron Letters* 227 (1967)

"Zur Säurekatalysierten Reaktion von Mannuronolacton Mit Methanol"  
H. W. H. Schmidt  
*Tetrahedron Letters* 235 (1967)

"Magnetic Non-Equivalence in the Methylene Group of an Ethyl Ester"  
G. E. Hall, D. Hughes, D. Rae and A. P. Rhodes  
*Tetrahedron Letters* 241 (1967)

"Formation D'une Liaison Germanium - Hydrogène dans les Réactions de Clivage des Germacyclobutanes par les Hydrogenosilanes et Hydrogenogermanes"  
P. Mazerolles, J. Dubac et M. Lesbre  
*Tetrahedron Letters* 255 (1967)

"General Synthesis of C Substituted Imidazoles"  
A. Novelli and A. De Santis  
*Tetrahedron Letters* 265 (1967)

"The Ginkgolides. I. Isolation and Characterization of the Various Groups"  
M. Maruyama, A. Terahara, Y. Itagaki and K. Nakanishi  
*Tetrahedron Letters* 299 (1967)

"The Ginkgolides. II. Derivation of Partial Structures"  
M. Maruyama, A. Terahara, Y. Itagaki and K. Nakanishi  
*Tetrahedron Letters* 303 (1967)

"The Ginkgolides. III. The Structure of the Ginkgolides"  
M. Maruyama, A. Terahara, Y. Nakadaira, M. C. Woods and K. Nakanishi  
*Tetrahedron Letters* 309 (1967)

"The Ginkgolides. IV. Stereochemistry of the Ginkgolides"  
M. Maruyama, A. Terahara, Y. Nakadaira, M. C. Woods, Y. Takagi and K. Nakanishi  
*Tetrahedron Letters* 315 (1967)

"The Ginkgolides. V. Some Aspects of their NMR Spectra"  
M. C. Woods, I. Miura, Y. Nakadaira, A. Terahara, M. Maruyama and K. Nakanishi  
*Tetrahedron Letters* 321 (1967)

"Aliphatic Chlorooximes and Their Applications in the Synthesis of Isoxazole and  $\beta$ -Furanone Systems"  
G. Casnati and A. Ricca  
*Tetrahedron Letters* 327 (1967)

"Hydrogen-Deuterium Exchange in Some Halopyridine N-Oxides: Relative Positional Reactivities"  
J. A. Zoltewicz and G. M. Kauffman  
*Tetrahedron Letters* 337 (1967)

"Interconversion of 9, 10-Dihydronaphthalene and Bicyclo[4.2.2]Deca-2,4,7,9-Tetraene"  
W. von E. Doering and J. W. Rosenthal  
*Tetrahedron Letters* 349 (1967)

"An Unusual Photochemical Transformation of Tetraphenylcyclopentadienone"  
N. Toshima and I. Moritani  
*Tetrahedron Letters* 357 (1967)

"Rearrangements of the Benzobicyclo[3.2.0]Heptenyl to the 2-(2-Indenyl)Ethyl and Benzobicyclo[2.2.1]Heptenyl Systems"  
H. Tanida, Y. Hata and H. Ishitobi  
*Tetrahedron Letters* 361 (1967)

"The Structure of Jegosapogenol"  
T. Nakano, M. Hasegawa, T. Fukumaru, and S. Tobinaga  
*Tetrahedron Letters* 365 (1967)

"Stereochemistry of Protopanaxadiol; Acid Catalysed Epimerization of C-20 Hydroxyl of Betulafolienetriol, Protopanaxadiol, and Their Derivatives"  
O. Tanaka, M. Nagai, T. Ohsawa, N. Tanaka and S. Shibata  
*Tetrahedron Letters* 391 (1967)

"Rearrangement of 10-Ethyl-2-Keto- $\Delta^{(9)};3^{(4)}$ -Hexahydro-naphthalene"  
K. H. Bell  
*Tetrahedron Letters* 397 (1967)

"Total Synthesis of  $\alpha$ -Santalol"  
R. G. Lewis, D. H. Gustafson, and W. F. Erman  
*Tetrahedron Letters* 401 (1967)

"The Chemistry of Cephalosporin P<sub>1</sub>"  
T. S. Chou and E. J. Eisenbraun  
*Tetrahedron Letters* 409 (1967)

"Solvent-Dependent Chemical Shifts of exo- $\alpha$ -Hydrogen Resonance in NMR Spectra of Quaternary Piperidinium Salts"  
A. T. Bottini and M. K. O'Rell  
*Tetrahedron Letters* 429 (1967)

"Organic Photochemistry. IV. A Novel Photodimerization in the Troponoid System. A Dimer of 2-Methoxy-6-Phenyltropone"  
T. Mukai, T. Miyashi and M. C. Woods  
*Tetrahedron Letters* 433 (1967)

"The Direct Synthesis of Pseudoaldoiburonate Acid"  
P. Sipos, S. Bauer  
*Tetrahedron Letters* 443 (1967)

"A New C<sub>20</sub>  $\alpha$ ,  $\beta$ -Unsaturated Aldehyde (3,7,13-Trimethyl-10-Isopropyl-2,6,11,13-Tetradecatetraen-1-Al) (I) from Tobacco"  
J. L. Courtney and S. S. McDonald  
*Tetrahedron Letters* 459 (1967)

"The Solvent Effect on the Photoreaction of Tetraphenylcyclopentadienone"  
I. Moritani and N. Toshima  
*Tetrahedron Letters* 467 (1967)

"The Structure of Marmin"  
A. Chatterjee, C. P. Dutta and S. Bhattacharyya, and H. E. Audier and B. C. Das  
*Tetrahedron Letters* 471 (1967)

"The Isolation and Characterisation of a New Type of Biflavan Derivative from a Xanthorrhoea"  
A. J. Birch, C. J. Dahl and A. Pelter  
*Tetrahedron Letters* 481 (1967)

"The Structure of Fomannosin, a Novel Sesquiterpene Metabolite of the Fungus Fomes annosus"

J. A. Kepler, M. E. Wall, J. E. Mason, C. Bassett, A. T. McPhail, G. A. Sim  
J. Am. Chem. Soc. 89, 1260 (1967)

"Conformational Aspects of Polypeptide Structure. XX. Helical Poly-N-methyl-L-alanine. Experimental Results" M. Goodman, and M. Fried  
J. Am. Chem. Soc. 89, 1264 (1967)

"Stable Carbonium Ions. XXXVII. Alkyl- and Arylalkyl-fluorocarbonium Ions. The Dimethyl- and Phenylmethyl-fluorocarbonium Ion." G. A. Olah, R. D. Chambers, and M. B. Comisarow  
J. Am. Chem. Soc. 89, 1268 (1967)

"Absolute Signs of Indirect Nuclear Spin-Spin Coupling Constants" R. A. Bernheim, B. J. Lavery  
J. Am. Chem. Soc. 89, 1279 (1967)

"Biosynthesis of Gentiothicin, a Novel Monoterpene" C. J. Coscia, and R. Guarnacci  
J. Am. Chem. Soc. 89, 1280 (1967)

"The Addition of Sulfur Dioxide to cis-Hexatriene. Thiepin 1,1-Dioxide" W. L. Mock  
J. Am. Chem. Soc. 89, 1281 (1967)

"Enolene Rearrangements. Relationship to the "Abnormal Claisen Rearrangement" and Other 1,5-Hydrogen Shift Processes" R. M. Roberts, R. G. Landolt, R. N. Greene, and E. W. Heyer  
J. Am. Chem. Soc. 89, 1404 (1967)

"The Free-Radical Chemistry of Fluoro Ketones. I. Reaction with Saturated Substrates" E. G. Howard, P. B. Sargeant, and C. G. Krespan  
J. Am. Chem. Soc. 89, 1422 (1967)

"The Nuclear Magnetic Resonance Spectra of Five Cyclopentadienides" W. B. Smith, W. H. Watson, and S. Chiranjeevi  
J. Am. Chem. Soc. 89, 1438 (1967)

"The Cycloheptatriene-Norcaradiene System. I. 7,7-Dicyanonorcaradienes. Preparation and Structure Proof" E. Ciganek  
J. Am. Chem. Soc. 89, 1454 (1967)

"Nuclear Magnetic Resonance Studies of Meisenheimer Complexes"  
K. L. Servis

J. Am. Chem. Soc. 89, 1508 (1967)

"The Mechanism of Fluorine-19 Exchange in the  $TiF_4$ 2(Donor) Complexes" D. S. Dyer, and R. O. Ragsdale  
J. Am. Chem. Soc. 89, 1528 (1967)

"Insertion of  $CCl_4$  into the Silicon-Carbon Bond of Silacyclobutanes" D. Seyfert, R. Damrauer, and S. S. Washburne  
J. Am. Chem. Soc. 89, 1538 (1967)

" $^{17}O$  Nuclear Magnetic Resonance of Manganese(III) Tris(Acetylacetone)" Z. Luz, B. L. Silver and D. Fiat  
J. Chem. Phys. 46, 469 (1967)

"Extension of the Valence-Bond Description of Nuclear Spin-Spin Coupling" M. Barfield  
J. Chem. Phys. 46, 811 (1967)

"Relationships in the Co-ordination Chemistry of Organo-aluminium Compounds. The Reaction of Dialkylaluminium Halides with Donor Molecules" C. A. Smith and M. G. H. Wallbridge,  
J. Chem. Soc., A, Inorg. Phys. Theor. 7 (1967)

"Phosphorus and Proton Magnetic Resonance Spectra of Esters of Pyrophosphoric and Hypophosphoric Acid and Some Derivatives" R. K. Harris, A. R. Katritzky, S. Musierowicz, and B. Ternai  
J. Chem. Soc., A, Inorg. Phys. Theor. 37 (1967)

"Perfluorovinyl Complexes of the Nickel Group" A. J. Rest, D. T. Rosevear, and F. G. A. Stone  
J. Chem. Soc., A, Inorg. Phys. Theor. 66 (1967)

"The Preparation and Properties of Some Silyl Esters" E. A. V. Ebsworth and J. C. Thompson  
J. Chem. Soc., A, Inorg. Phys. Theor. 69 (1967)

"Metal  $\beta$ -Diketone Complexes. Part IV. Acid Derivatives of Some Platinum-Carbon Bonded Acetylacetone Complexes" D. Gibson, J. Lewis, and C. Oldham  
J. Chem. Soc., A, Inorg. Phys. Theor. 72 (1967)

"Boron Hydride Derivatives. Part XI. Iodination of Decaborane" M. H. G. Wallbridge, J. Williams and R. L. Williams  
J. Chem. Soc., A, Inorg. Phys. Theor. 132 (1967)

" $^{59}Co$  Nuclear Magnetic Resonance of Organo-Cobalt Compounds" E. A. C. Lucken, K. Noack, and D. F. Williams  
J. Chem. Soc., A, Inorg. Phys. Theor. 148 (1967)

"The  $^{55}Mn$  Nuclear Magnetic Resonance Spectra of Alkyl- and Acyl-manganesepentacarbonyls and Related Compounds" F. Calderazzo, E. A. C. Lucken, and D. F. Williams  
J. Chem. Soc., A, Inorg. Phys. Theor. 154 (1967)

"The Interaction of 1,3,5-Trinitrobenzene with Aliphatic Amines in Dimethyl Sulphoxide Solution" M. R. Crampton and V. Gold  
J. Chem. Soc., B, Phys. Org. 23 (1967)

"The Hydrolysis of Ethyl Vinyl Ether. Part I. Reaction Mechanism" A. J. Kresge and Y. Chiang  
J. Chem. Soc., B, Phys. Org. 53, (1967)

"Organosilicon Compounds. Part II. The Methyl Proton Resonance Spectra of Methylphenyldisiloxanes" J. Homer, A. W. Jarvie, A. Holt, and H. J. Hickton  
J. Chem. Soc., B, Phys. Org. 67 (1967)

"Kinetic Study of the Reactions of 1,1-Diphenylallene in Ethanol in the Presence of Sodium Ethoxide" P. Beltrame, D. Pitea, A. Marzo, and M. Simonetta  
J. Chem. Soc., B, Phys. Org. 71, (1967)

"The Ionisation of 4-Nitrobenzyl Cyanide in Alkaline Media" M. R. Crampton  
J. Chem. Soc., B, Phys. Org. 85 (1967)

"Alkaloids of Uncaria pteropoda. Isolation and Structures of Pteropodine and Isopteropodine" K. C. Chan, F. Morsingh, and G. B. Yeah  
J. Chem. Soc., C, Org. 2245 (1966)

"Thermal Rearrangement and Other Reactions of  $3\beta$ -Acetoxy- $5\alpha$ -chlorocholestan- $6\beta$ -yl Nitrate" J. S. Mills  
J. Chem. Soc., C, Org. 2261 (1966)

"Über die Trimethylsilylderivate des Methylhydrazines.  
Trimethyl-trimethylsilyl-hydrazin"  
F. Höfler und U. Wannagat  
Monatsh. Chem. 97, 1598 (1966)

"Über Heterocyclen, 14. Mitt.: 2-Oxo- bzw. 2-Thiono-5-  
acyl-6-methyltetrahydropyrimidine"  
G. Zigeuner, W. Nischk und B. Juraszovits  
Monatsh. Chem. 97, 1611 (1966)

"Homologe Alkyliminophosphorsäuretrichloride und deren  
Ammonolyse"  
V. Gutmann, K. Utváry und M. Bermann  
Monatsh. Chem. 97, 1745 (1966)

"Reaktionen mit phosphororganischen Verbindungen, 10. Mitt."  
E. Zbiral und E. Werner  
Monatsh. Chem. 97, 1795 (1966)

"Nuclear Magnetic Resonance Spectroscopic Studies of  
Erythrocyte Membranes"  
D. Chapman, V. B. Kamat, J. de Gier, and S. A. Penkett  
Nature 213, 74 (1967)

"A Cyclobutane Derivative from Chloroprene Dimerization"  
N. C. Billingham, P. A. Leeming, R. S. Lehrle, and  
J. C. Robb  
Nature 213, 494 (1967)

"Simultaneous Determination of Several Charge-transfer  
Complex Association Constants using Nuclear Magnetic  
Resonance"  
R. Foster and C. A. Fyfe  
Nature 213, 592 (1967)

"The Formation of Perylenequinones in Etholated Cucumber  
Seedlings Infected with Cladosporium Cucumerinum"  
J. C. Overeem and A. K. Sijpesteijn, and A. Fuchs  
Phytochem. 6, 99 (1967)

"Madhuca Latifolia. Constituents of Fruit Pulp and Nut-  
Shell)  
Y. C. Awasthi and C. R. Mitra  
Phytochem. 6, 121 (1967)

"Phytochemical Studies—VII. Assignment of the Double  
Bond Configuration in Hibalactone and Isohibalactone"  
K.-T. Wang, K. Yamashita and B. Weinstein  
Phytochem. 6, 131 (1967)

"Alkaloids of Lupinus Diffusus Nutt"  
S. I. Goldberg and R. F. Moates  
Phytochem. 6, 137 (1967)

"Extractives of Jack Pine Bark: Occurrence of (+)-13-  
Epimanyol Oxide and Related Labdane Diterpenes"  
C. L. Bower and J. W. Rowe  
Phytochem. 6, 151 (1967)

"Field Dependence of Nuclear Relaxation in Ferromagnetic  
Metals"  
V. Jaccarino and N. Kaplan, R. E. Walstedt and J. H.  
Wernick  
Phys. Letters 23, 514 (1966)

"Proton Spin-Lattice Relaxation in  $(\text{NH}_4)_2\text{Cd}_2(\text{SO}_4)_3$ "  
I. Todo and I. Tatsuzaki  
Phys. Letters 23, 519 (1966)

"Nuclear Magnetic Resonance Studies of Point Defects  
in  $\text{BaF}_2$  Crystals"  
J. R. Miller and P. P. Mahendroo  
Phys. Letters 23, 535 (1966)

"Spin-Lattice Nuclear Relaxation in Butyl Phthalate"  
F. Lehaci  
Phys. Letters 24A, 35 (1967)

"Oscillatory Spin Echo Decay in Hexagonal Close Packed  
Cobalt"  
P. C. Riedi and R. G. Scurlock  
Phys. Letters 24A, 42 (1967)

"Nuclear Zeeman-Dipolar Cross Relaxation Times"  
S. Clough  
Phys. Letters 24A, 49 (1967)

"Electric Field Gradient at the Deuteron Site in Liquid  
 $\text{DCl}$ "  
H. Boehme and M. Eisner  
Phys. Letters 24A, 59 (1967)

"Nuclear Magnetic Resonance in Liquid Gallium Alloys"  
W. van der Lugt and S. B. van der Molen  
Phys. Stat. Sol. 19, 327 (1967)

"Nuclear Magnetic Resonance and Mössbauer Effect Study  
of  $\text{Sn}^{119}$  in Rare Earth-Tin Intermetallic Compounds"  
F. Borsig, R. G. Barnes, and R. A. Reese  
Phys. Stat. Sol. 19, 359 (1967)

"On the Theory of Spin-Spin Relaxation"  
R. H. Terpstra and P. Mazur  
Physica 32, 1813 (1966)

"Radiation Induced Solid-State Polymerization of Trioxane"  
Ya. G. Urman, I. Ya. Slonim and A. D. Yermolayev  
Polymer Sci. U.S.S.R. 8, 271 (1966)

"Nuclear Magnetic Resonance Study of Vinylidene Fluoride  
and Trifluorochloroethylene Copolymers"  
A. S. Shashkov, F. A. Galil-Ogly and A. S. Novikov  
Polymer Sci. U.S.S.R. 8, 288 (1966)

"Nuclear Magnetic Resonance in Dilute Alloys of Lithium"  
J. M. Titman and S. H. Kellington  
Proc. Phys. Soc. (London) 90, 499 (1967)

"High Sensitivity Zero Crossing Detector for Magnetic  
Resonance Lines"  
J. T. Hickmott, Jr., T. Kushida and J. C. Murphy  
Rev. Sci. Instr. 38, 29 (1967)

"Simultaneous Temperature Measurements in High Resolution  
NMR Experiments"  
F. Conti  
Rev. Sci. Instr. 38, 128 (1967)

"A Study of the Substituent Effect in Aromatic Compounds  
by Fluorine and Proton N.m.r. Spectroscopy"  
Y. Takeuchi  
Sci. Papers Coll. Gen. Educ. Univ. Tokyo 16, 231 (1966)

"Saturation of an Inhomogeneously Broadened Magnetic  
Resonance Line"  
G. R. Khutishvili  
Soviet Phys.—JETP (English Transl.) 23, 1092 (1966)

"Irreversibility of Transition of NMR Signals Through  
a Weak Field in Some Molecular Crystals"  
E. I. Fedin and N. V. Gorskaya  
Soviet Phys. JETP Letters (English Transl.) 2, 11, (1967)

"Shift of the NMR Frequencies in Paramagnetic  $\text{TlMnF}_3$ "  
D. A. Zhogolev  
Soviet Phys.—Solid State (English Transl.) 8, 2237 (1967)

"NMR Spectra of the  $X_n\text{AA}'X_n'$  Type"  
D. J. Mowthorpe and A. C. Chapman  
Spectrochim. Acta, Pt. A, 23, 451 (1967)

"On the Reaction of Nitrosochlorination of Alkenylmethyl-siloxanes"  
Academician K. A. Andrianov, V. I. Sidorov, and L. M. Khananashvili  
Dokl.-Chem. Sect. (English Transl.) 167, 341 (1966)

"On the Structure of Certain  $\alpha$ ,  $\beta$ -Unsaturated Ketones and Their Oxides"  
Academician B. A. Arbuzov, N. S. Sanchugova, Yu. Yu. Samitov and L. K. Yuldasheva  
Dokl.-Chem. Sect. (English Transl.) 167, 344 (1966)

"A General Method for the Synthesis of 3-Nitro-isoxazolines"  
V. A. Tartakovskii, A. A. Onishchenko, I. E. Chlenov and S. S. Novikov  
Dokl.-Chem. Sci. Sect. (English Transl.) 167, 406 (1966)

"The Structure of Olivin"  
Yu. A. Berlin, I. V. Vasina, B. A. Klyashchitskii, M. N. Kolosov, G. Yu. Pek, L. A. Piotrovich, O. A. Chuprunova, and Academician M. M. Shemyakin  
Dokl.-Chem. Sci. Sect. (English Transl.) 167, 413 (1966)

"Sintesi e proprietà delle 1H-3,4-diidro-2,3-benzossazine"  
G. Pifferi, P. Consonni ed E. Testa  
Gazz. Chim. Ital. 96, 1671 (1966)

"Ricerche sulla reattività di 3,7-diaza-adamantani. Sintesi dell'1,5-difenil-3,7-diaza-10-tio-adamantan-9-one, 10-ossido e 10,10-diossalido"  
D. Misiti e S. Chiavarelli  
Gazz. Chim. Ital. 96, 1696 (1966)

"Photolyse von 2,2,4,4-Tetramethylcyclobutanon-Derivaten"  
H. U. Hostettler  
Helv. Chim. Acta 49, 2417 (1966)

"Stereospezifische Synthese und Isomerisierung der 10-Chlor-decahydroisoquinoline"  
C. A. Grob und R. A. Wohl  
Helv. Chim. Acta 49, 2434 (1966)

"Synthese und Abbau von 1-(5-Nitro-2-thiazolyl)-2-imidazolidinon und Derivaten"  
M. Wilhelm, F.-H. Marquardt, Kd. Meier und P. Schmidt  
Helv. Chim. Acta 49, 2443 (1966)

"Steroide und Sexualhormone. Die Synthese von N-Acetyl-3-aza-A-homo- $5\beta$ , 10"-androstan und seines  $5\alpha$ -Isomeren"  
Frl. G. Eggert und H. Wehrli  
Helv. Chim. Acta 49, 2453 (1966)

"Organische Phosphorverbindungen. XXVII. Die Direkte Synthese von Tetramethylphosphoniumhalogeniden"  
L. Maier  
Helv. Chim. Acta 49, 2458 (1966)

"Über die optische Reinheit und die Chiralität der enantiomeren  $\alpha$ -H<sub>1</sub>-Benzylamine"  
H. Gerlach  
Helv. Chim. Acta 49, 2481 (1966)

"Die Konstitution von Roridin A"  
B. Böhner und Ch. Tamm  
Helv. Chim. Acta 49, 2527 (1966)

"Die Konstitution von Roridin D"  
B. Böhner und Ch. Tamm  
Helv. Chim. Acta 49, 2547 (1966)

"Stoffwechsel-Endprodukte von Phyllochinon, Menachinon-4, Ubichinon-9) und Hexahydroplastochinon-4 (Phytanylplastochinon)"  
U. Gloor J. Würsch, H. Mayer, O. Isler und O. Wiss  
Helv. Chim. Acta 49, 2582 (1966)

"Syntheses von Trispiro[5.2.2.5.2.2.]heneicosa-1,4,13,16-tetraen-3,15-dion durch doppelte intramolekulare C-Alkylierung eines Diphenols"  
R. S. Atkinson und A. S. Dreiding  
Helv. Chim. Acta 50, 23 (1967)

"Conoflorin  
J. J. Dugan, M. Hesse, U. Renner und H. Schmid  
Helv. Chim. Acta 50, 60 (1967)

"Weitere Alkaloide aus Aspidosperma limae Woods"  
M. Pinar und H. Schmid  
Helv. Chim. Acta 50, 89 (1967)

"«Long-range»-Kopplung zwischen Protonen geminaler Methylgruppen in Kernresonanzspektren"  
C. Pascual und W. Simon  
Helv. Chim. Acta 50, 94 (1967)

"Protonenresonanzspektroskopische Untersuchungen an Bicyclo[2.2.1]heptan- und Bicyclo[2.2.2]octan-Derivaten: Einfluss von Substituenten auf die chemische Verschiebung"  
E. Pretsch, H. Immer, C. Pascual, K. Schaffner und W. Simon  
Helv. Chim. Acta 50, 105 (1967)

"Zur Kenntnis des Muscazons"  
R. Reiner und C. H. Eugster  
Helv. Chim. Acta 50, 128 (1967)

"2(3H)-Oxazolone durch Photoumlagerung von 3-Hydroxy-isoxazolen. Synthese von Muscazon"  
H. Goth, A. R. Gagneux, C. H. Eugster und H. Schmid  
Helv. Chim. Acta 50, 137 (1967)

"Über die Eigenschaften des X-Teils von A<sub>n</sub>B<sub>m</sub>-Kernresonanzspektren"  
P. Diehl und P. Weisenhorn  
Helv. Chim. Acta 50, 143 (1967)

"Über eine aussergewöhnliche Stereospezifität bei der Hydroborierung der diastereomeren (1 R)-Isopulegole mit Diboran"  
K. H. Schulte-Elte und G. Ohloff  
Helv. Chim. Acta 50, 153 (1967)

"Photochemisch Reaktionen. O-Acetyl-6,7-methylen- und O-Acetyl-1-dehydro-6,7-methylen-testosterone: Stereochemie und Resultate der UV.-Bestrahlung"  
J. Pfister, H. Wehrli und K. Schaffner  
Helv. Chim. Acta 50, 166 (1967)

"Die Cardenolide der Samen von Strophanthus gratus (Wall. et Hook.) Franch. 2. Mitteilung"  
U. P. Geiger, E. Weiss und T. Reichstein  
Helv. Chim. Acta 50, 179 (1967)

"Strogosid, Strukturbestimmung"  
U. P. Geiger, E. Weiss und T. Reichstein  
Helv. Chim. Acta 50, 194 (1967)

"Über die Alkaloide von Aspidosperma discolor A.D.C."  
N. J. Dastoore, A. A. Gorman und H. Schmid  
Helv. Chim. Acta 50, 213 (1967)

"Über die photochemische Cyclisierung von 2-Allylphenolen"  
G. Frater und H. Schmid  
Helv. Chim. Acta 50, 255 (1967)

"19-nor-Steroide V. Neue Synthese von 6-Dehydro-19-nor-Steroiden"  
J. Kalvoda und G. Aner  
Helv. Chim. Acta 50, 269 (1967)

"Alkylation of o- and p-Tolunitriles with Halides by Means of Sodium Amide in Liquid Ammonia"  
F. H. Rash, S. Boatman, and C. R. Hauser  
*J. Org. Chem.* 32, 372 (1967)

"The Proton Magnetic Resonance Spectra of  $\alpha$ -Chloro-acetamidinium Chlorides and Their Corresponding Thiol-sulfates (Bunte Salts)"  
L. Bauer, C. L. Bell, K. Rover Sandberg, and A. P. Parulkar  
*J. Org. Chem.* 32, 376 (1967)

"Cyanation and Hydrocyanation of Unsaturated Hydrocarbons. I. Reaction of 4a-Methyl-1,3,9-triphenyl-4aH-fluorene with Sodium Cyanide"  
B. E. Galbraith and H. R. Snyder  
*J. Org. Chem.* 32, 380 (1967)

"The Reaction of 3-Unsubstituted N-Arylisoxazolium Salts with Carboxylic Acid Anions"  
R. B. Woodward, D. J. Woodman, and Y. Kobayashi  
*J. Org. Chem.* 32, 388 (1967)

"The Synthesis and Properties of Seven-, Eight-, and Nine-Membered Silicon Ring Systems"  
R. A. Benkeser and R. F. Cunico  
*J. Org. Chem.* 32, 395 (1967)

"Lactone Trimer of Dimethylketene"  
R. D. Clark  
*J. Org. Chem.* 32, 399 (1967)

"Preparation of  $\beta$ -Ketoaldehydes by Acylation of Aldehyde Enamines"  
T. Inukai and R. Yoshizawa  
*J. Org. Chem.* 32, 404 (1967)

"Low-Temperature Fluorination of Schiff Bases"  
R. F. Merritt and F. A. Johnson  
*J. Org. Chem.* 32, 416 (1967)

"A New Rearrangement Product in the 6,7-Benzomorphan Series"  
R. T. Parfitt, M. Takeda and H. Kugita  
*J. Org. Chem.* 32, 419 (1967)

"Synthesis of Substituted Octahydroindolo[2,3-a]quinolin-izines. The Formation of a New Type of Ring System"  
Cs. Szantay, L. Tóke, K. Honty, and Gy. Kalauš  
*J. Org. Chem.* 32, 423 (1967)

"Base-Promoted Reactions of Epoxides. I. Isomerization of Some Cyclic and Acyclic Epoxides by Lithium Diethylamide"  
J. K. Crandall and L.-H. Chang  
*J. Org. Chem.* 32, 435 (1967)

"The Chemical Shift of the Hydroxyl Proton of Oximes in Dimethyl Sulfoxide"  
G. G. Kleinschmidt, J. A. Jung, and S. A. Studniarz  
*J. Org. Chem.* 32, 460 (1967)

"On the Bromination of 3-Phenylthiophene"  
S. Gronowitz, N. Gjös, R. M. Kellogg, and H. Wynberg  
*J. Org. Chem.* 32, 463 (1967)

"meso- and dl- $\alpha,\alpha'$ -Bis(difluoramino)biphenyls. Preparation and Nuclear Magnetic Resonance Spectra"  
F. A. Johnson, C. Haney, and T. E. Stevens  
*J. Org. Chem.* 32, 466 (1967)

"Electrolytic Decarboxylation of Quinuclidine-2-carboxylic Acid"  
P. G. Cassman and B. L. Fox  
*J. Org. Chem.* 32, 480 (1967)

"Nonpolar Solvent Effects. II. Nuclear Magnetic Resonance Evidence for Complex Formation"  
D. C. Berndt  
*J. Org. Chem.* 32, 482 (1967)

"9H-Pyrrolo[1,2-a]indoles"  
V. J. Mazzola, K. F. Bernady, and R. W. Franck  
*J. Org. Chem.* 32, 486 (1967)

"Synthesis through Oxyplumbation. Reaction of Styrene with Acetylacetone in the Presence of Lead Tetraacetate"  
K. Ichikawa and S. Uemura  
*J. Org. Chem.* 32, 493 (1967)

"Reactions of Methyl  $\beta$ -Naphthyl Sulfides with N-Halo-succinimides"  
D. L. Tuleen and D. H. Buchanan  
*J. Org. Chem.* 32, 495 (1967)

"The Use of Benzene in Separating Aromatic Methoxyl Bands in Nuclear Magnetic Resonance Spectroscopy"  
H. M. Fales and K. S. Warren  
*J. Org. Chem.* 32, 501 (1967)

"Synthetic Eurocoumarins. VIII. The Pechmann Condensation of 2-Alkylhydroquinones"  
K. D. Kaufman, R. C. Kelly and D. C. Eaton  
*J. Org. Chem.* 32, 504 (1967)

"The Addition of N-Sulfinylamine to Bicycloalkenes"  
A. Macaluso and J. Hamer  
*J. Org. Chem.* 32, 506 (1967)

"Constituents of Helenium Species. XX. Virginolide, a New Guianolide from Helenium virginicum Blake"  
W. Herz and P. S. Santhanam  
*J. Org. Chem.* 32, 507 (1967)

"Organometallic Compounds. 4. The Constitution of the Ethylzinc Halides"  
M. H. Abraham and P. H. Rolfe  
*J. Organometal. Chem.* 1, 35 (1967)

"Beiträge zur Chemie der Borazide IX. Wanderungsstendenzen, Kinetik und Mechanismus der Thermischen Diorganoborazid-Umlagerung"  
P. I. Paetzold and P. P. Haberegger  
*J. Organometal. Chem.* 1, 61 (1967)

"Redistribution Studies with Organopolysilanes I. Methoxy-substituted Polysilanes"  
W. H. Atwell and D. R. Weyenberg  
*J. Organometal. Chem.* 1, 71 (1967)

"New Reactions of Organolead Compounds Not Involving Lead-Carbon Bond Cleavage"  
W. Gerrard and D. B. Green  
*J. Organometal. Chem.* 7, 91 (1967)

" $^1\text{H-NMR}$ -Messungen an Paramagnetischen Di-Cyclopentadienyl-Metall-Komplexen"  
H. P. Fritz, H. J. Keller und K. E. Schwarzhans  
*J. Organometal. Chem.* 1, 105 (1967)

"Über Aromatenkomplexe von Metallen. XCIV. Über Konkurrierende Friedel-Crafts-Acylierungen an  $\pi$ -Cyclopentadienyl-Metall-Komplexen"  
E. O. Fischer, M. von Foerster, C. G. Kreiter und K. E. Schwarzhans  
*J. Organometal. Chem.* 1, 113 (1967)

"Chemistry of the Cyclopentadienyl Metal Carbonyls IV. New Perfluoroalkyl Derivatives of Cobalt"  
P. M. Treichel and G. P. Werber  
*J. Organometal. Chem.* 1, 157 (1967)

"Synthesis of Heptahelicene. Benzo[c]phenanthro[4,3-g] Phenanthrene"  
M. Flamang-Barbieux, J. Nasielski, and R. H. Martin  
*Tetrahedron Letter* 743 (1967)

"Synthesis of [4,4,4] Propellane"  
J. Altman, D. Becker, D. Ginsburg and H. J. E. Leewenthal  
*Tetrahedron Letters* 757 (1967)

"Internal Rotation About the =C-N Bond in Enamines and the =N=N Bond in Hydrazones"  
A. Manschreck and U. Koelle  
*Tetrahedron Letters* 863 (1967)

"Pyrimidine XXI: Zur Synthese des ersten Definierten 2',3',5'-Tri-O-trityl-ribonucleosids"  
H. U. Blank and W. Pfeiderer  
*Tetrahedron Letters* 869 (1967)

"Synthesis of Some Cobalt Derivatives of Carbohydrates"  
A. Rosenthal and H. J. Koch  
*Tetrahedron Letters* 871 (1967)

"Transesterification of Cyclic Esters"  
P. A. Bristow and J. G. Tillett  
*Tetrahedron Letters* 901 (1967)

"The Stereospecific Synthesis of *cis*- $\beta$ -Bergamotene"  
T. W. Gibson and W. F. Erman  
*Tetrahedron Letters* 905 (1967)

"Electrostatic Field Effects and the P.M.R. Spectra of Pyridine Derivatives in Hydrogen Bonding Solvents"  
T. M. Spotswood and C. I. Tanzer  
*Tetrahedron Letters* 911 (1967)

"Cycloadditionen von Nitriloxiden an Methylenphosphorane"  
R. Huisgen und J. Wulff  
*Tetrahedron Letters* 917 (1967)

"Rearrangements of 32-Oxygenated Lanostanes"  
J. Fried and J. W. Brown  
*Tetrahedron Letters* 925 (1967)

"Reversible Cyclohexadiene-Hexatriene Valence Isomerizations. A New Class of Photochromic Compounds"  
K. R. Huffman, M. Loy, Wm. A. Henderson, Jr., and E. F. Ulman  
*Tetrahedron Letters* 931 (1967)

"Deamination of 6-Aminopenicillanic Acid - the Origin of a 2,3-Dihydro-1,4-thiazin-3-one"  
R. J. Stoodley  
*Tetrahedron Letters* 941 (1967)

"Some Consequences of the Magnetic Interaction of Protons and Electrons"  
W. T. Dixon  
*Theoret. Chim. Acta (Berl.)* 6, 359 (1966)

"Coupling Constants in Fluorinated Cyclic Compounds. Part 2—Fluorocyclopentenes and Perfluorocyclohexadiene-1,3"  
J. Feeney, L. H. Suctcliffe and S. M. Walker  
*Trans. Faraday Soc.* 62, 2969 (1966)

"Nuclear Magnetic Resonance Spectra of Cyclic Fluorocarbons. Part 2.—F—F and H—F Coupling Constants in Fluorocyclohexanes"  
A. Peake and L. F. Thomas  
*Trans. Faraday Soc.* 62, 2980 (1966)

"Nuclear Magnetic Resonance Spectra of Some Inorganic Ring Systems. Part 1.—Proton Resonance Spectra of 1,3-Diaza-2-thiacyclopentanes"  
E. W. Abel, R. P. Bush and F. J. Hopton  
*Trans. Faraday Soc.* 62, 3277 (1966)

"N.M.R. Spectra of Silicon Hydride Derivatives. Part. 6. Group 5 Trisilyls"  
E. A. V. Ebsworth and G. M. Sheldrick  
*Trans. Faraday Soc.* 62, 3282 (1966)

"Nuclear Magnetic Resonance Study of Hydrogen-Bonding in 1-Dodecanol and Other Alkanols"  
A. B. Littlewood and F. W. Willmott  
*Trans. Faraday Soc.* 62, 3287 (1966)

"Die pH-Abhängigkeit der Kernresonanzspektren der Äpfelsäure, O-Methyl-Äpfelsäure und Asparaginsäure"  
K. G. R. Pachler  
*Z. Anal. Chem.* 224, 211 (1967)

"Kernrelaxation und Molekülbewegungen in Lösungen freier Radikale"  
W. Müller-Warmuth and V. Printz  
*Z. Naturforsch.* 21a, 1849 (1966)

"Kernresonanz-Untersuchungen an Phosphor-Halogen-Verbindungen in festem Zustand"  
W. Wieker und A.-R. Grimmer  
*Z. Naturforsch.* 21b, 1103 (1966)

"Tris-trimethylgermany-phosphin and -arsin"  
I. Schumann und H. Blass  
*Z. Naturforsch.* 21b, 1105 (1966)

"Tropylium-polyhalogenide"  
K. Heinz Büchel und A. Conte  
*Z. Naturforsch.* 21b, 1110 (1966)

" $^{31}$ P-Kernresonanzspektren von Brenzcatechyl-Derivaten der Phosphorsäure und der Phosphorigen Säure"  
E. Fluck, H. Gross, H. Binder und J. Gloede  
*Z. Naturforsch.* 21b, 1125 (1966)

"IR- und  $^1$ H-Kernresonanzmessungen an In(OH)<sub>n</sub>"  
E. Schwarzmüller, O. Glemer und H. Marsmann  
*Z. Naturforsch.* 21b, 1128 (1966)

"Zur Struktur eines Bi-pyridon-yls"  
H. Junek, H. Sterk und A. Schmidt  
*Z. Naturforsch.* 21b, 1145 (1966)

"Phorob"  
E. Hecker, C. V. Szczepanski, H. Kubinyi, H. Bresch, E. Härlé, H. Ulrich Schairer und H. Bartsch  
*Z. Naturforsch.* 21b, 1204 (1966)

" $^{31}$ P-NMR-spektroskopische Untersuchungen an gemischtsubstituierten Phosphornitrit-Chlorid-Bromiden"  
G. Engelhardt, E. Steger, und R. Stahlberg  
*Z. Naturforsch.* 21b, 1231 (1966)

"Zur Existenz von Thorium(IV)-oxidhydroxid"  
O. Glemer, H. Marsmann und E. Austin  
*Z. Naturforsch.* 21b, 1232 (1966)

"Zur Kenntnis des Silyltriazens ( $\text{Me}_3\text{Si}$ )<sub>2</sub>N=N=C<sub>6</sub>H<sub>5</sub><sup>1,2</sup>"  
N. Wiberg und W. Ch. Joo  
*Z. Naturforsch.* 21b, 1234 (1966)

"Introduction to Practical High Resolution Nuclear Magnetic Resonance Spectroscopy"  
D. Chapman and P. D. Magnus  
Academic Press, New York. (1966)

"Stable Carbonium Ions. XXX. The  $\rho$ -Anisonium and 2,4,6-Trimethylphenonium Ions"  
G. A. Olah, E. Namanworth, M. B. Comisarow, and B. Ramsey  
*J. Am. Chem. Soc.* 89, 711 (1967)

"The Cleavage of Nonenolizable Ketones"  
P. G. Gassman, J. T. Lumb, and F. V. Zalar  
*J. Am. Chem. Soc.* 89, 946 (1967)

"Phosphirane"  
R. I. Wagner, L. D. Freeman, H. Goldwhite, and D. G. Rowsell  
*J. Am. Chem. Soc.* 89, 1102 (1967)

"Trimethylenemethane from Photolysis of 3-Methylene-cyclobutanone"  
P. Dowd, K. Sachdev  
*J. Am. Chem. Soc.* 89, 715 (1967)

"The Preparation and Some Reactions of 1,2-Bis(trimethyltin) benzene and Related Compounds"  
A. B. Evnin and D. Seyerth  
*J. Am. Chem. Soc.* 89, 952 (1967)

"The Pentalenylcycloocta-1,5-dienerhodium Anion and Hydroptalenyl Complexes of Thallium, Platinum, and Rhodium"  
T. J. Katz and J. J. Mrowca  
*J. Am. Chem. Soc.* 89, 1105 (1967)

" $t$ -Butylsulfenic Acid"  
J. R. Shelton, K. E. Davis  
*J. Am. Chem. Soc.* 89, 718 (1967)

"1,3-Bridged Aromatic Systems. I. A New Synthesis of Pyrazoles"  
W. E. Parham and J. F. Dooley  
*J. Am. Chem. Soc.* 89, 985 (1967)

"Bicyclo[2.2.2]octeneboronic Acids and Their Reaction with Mercuric Chloride"  
D. S. Matteson and Meldon L. Talbot  
*J. Am. Chem. Soc.* 89, 1123 (1967)

"A Nuclear Magnetic Resonance Study of the Reversible Hydration of Aliphatic Aldehydes and Ketones. I. Oxygen-17 and Proton Spectra and Equilibrium Constants"  
P. Greenzaid, Z. Luz, and D. Samuel  
*J. Am. Chem. Soc.* 89, 749 (1967)

"Sequence Peptide Polymers. I. Polymers Based on Aspartic Acid and Glycine"  
DeL. F. DeTar, M. Gouge, W. Honsberg and U. Honsberg  
*J. Am. Chem. Soc.* 89, 988 (1967)

"The Photochemistry of (+)-2-Carene-4 $\alpha$ -methanol"  
P. J. Kropp  
*J. Am. Chem. Soc.* 89, 1126 (1967)

"A Nuclear Magnetic Resonance Study of the Reversible Hydration of Aliphatic Aldehydes and Ketones. II. The Acid-Catalyzed Oxygen Exchange of Acetaldehyde"  
P. Greenzaid, Z. Luz, and D. Samuel  
*J. Am. Chem. Soc.* 89, 756 (1967)

"The Photoreduction of Kynurenic Acid to Kynurenone Yellow and the Occurrence of 3-Hydroxy-L-kynurenone in Butterflies"  
T. Tokuyama, S. Senoh, T. Sakan, K. S. Brown, Jr., and B. Witkop  
*J. Am. Chem. Soc.* 89, 1017 (1967)

"Conformational Isomerism in 1-Substituted Derivatives of 3,3-Dimethylbutane"  
G. M. Whitesides, J. P. Sevenair, and R. W. Goetz  
*J. Am. Chem. Soc.* 89, 1135 (1967)

"Nuclear Magnetic Resonance Line-Shape and Double-Resonance Studies of Ring Inversion in Cyclohexane-d<sub>11</sub>"  
F. A. L. Anet and A. J. R. Bourn  
*J. Am. Chem. Soc.* 89, 760 (1967)

"Tris(pentafluorophenyl)methyl Cation"  
R. Filler C.-S. Wang, M. A. McKinney, F. N. Miller  
*J. Am. Chem. Soc.* 89, 1026 (1967)

"Synthesis of Silacyclobutane and Some Related Compounds"  
J. Laane  
*J. Am. Chem. Soc.* 89, 1144 (1967)

"Racemization and Deuteration at the Asymmetric Nitrogen Center of the N-Methylmethylenediaminetetraamminecobalt (III) Ion"  
D. A. Buckingham, L. G. Marzilli and A. M. Sargeson  
*J. Am. Chem. Soc.* 89, 825 (1967)

"Stable Carbonium Ions. XXXV. Pentafluorophenyl-carbonium Ions"  
G. A. Olah, and M. B. Comisarow  
*J. Am. Chem. Soc.* 89, 1027 (1967)

"Nitrosative Cleavage of Tertiary Amines"  
P. A. S. Smith and R. N. Loepky  
*J. Am. Chem. Soc.* 89, 1147 (1967)

"Phosphorus Trioxide as a Tetradentate Ligand. II. Borane Complexes"  
J. G. Riess and J. R. Van Wazer  
*J. Am. Chem. Soc.* 89, 851 (1967)

"Cyclopropanes. V. Inhibition of Polymerization and Addition of Acids"  
N. J. Turro and W. B. Hammond  
*J. Am. Chem. Soc.* 89, 1028 (1967)

"Oxygen-17 Nuclear Magnetic Resonance Studies of the Equilibria between the Enol Forms of  $\beta$ -Diketones"  
M. Gorodetsky, Z. Luz, and Y. Mazur  
*J. Am. Chem. Soc.* 89, 1183 (1967)

" $\pi$ -Electron Participation in the Acetolysis of  $\beta$ -(syn-7-Norbornenyl)ethyl  $\rho$ -Bromobenzenesulfonate"  
R. S. Bly, R. K. Bly, A. O. Bedenbaugh, and O. R. Vail  
*J. Am. Chem. Soc.* 89, 880 (1967)

"Benzvalene, the Tricyclic Valence Isomer of Benzene"  
K. E. Wilzbach, J. S. Ritscher, and L. Kaplan  
*J. Am. Chem. Soc.* 89, 1031 (1967)

"Intramolecular Catalysis. X. Facilitation of Acylation of Tertiary Hydroxyl Groups in Alicyclic 1,3-Diaxial Glycols"  
S. M. Kupchan, J. H. Block, and A. C. Isenberg  
*J. Am. Chem. Soc.* 89, 1189 (1967)

"Conformational Analysis. IX. Conformational and Substituent Dependence of the Hydroxyl Proton Magnetic Resonance of Arylcarbinols"  
R. J. Ouellette, D. L. Marks, and D. Miller  
*J. Am. Chem. Soc.* 89, 913 (1967)

"The Structure of Cyclopropane and Cyclobutane from Protone Nuclear Magnetic Resonance in a Nematic Solvent"  
S. Meiboom, L. C. Snyder  
*J. Am. Chem. Soc.* 89, 1038 (1967)

"The Stereospecific Addition of Dibenzo[a,d]cycloheptenylidene and Tribenzo[a,c,e]cycloheptenylidene to Olefins"  
S.-I. Murahashi, I. Moritani, and M. Nishino  
*J. Am. Chem. Soc.* 89, 1257 (1967)

"The Structure of the Tetrahalogenocuprate Ions in Solution"  
D. Forster  
Chem. Commun. 113 (1967)

"Long-range Phosphorus-Hydrogen Interactions in Bis(Dimethylglyoximate)cobalt(III) Complexes"  
M. Green, R. J. Mawby and G. Swinden  
Chem. Commun. 127 (1967)

"Synthesis of 1,2-Disubstituted Benzimidazoles Involving an N-Heteroparaffinic Ring Cleavage"  
R. Garner and H. Suschitzky  
Chem. Commun. 129 (1967)

"Hydrogen-isotope Exchange in Substituted Anilinium Ions"  
J. R. Blackborow and J. H. Ridd  
Chem. Commun. 132 (1967)

"A Stable Four-membered-ring Ylid-Ketone Adduct"  
G. H. Birum and C. N. Mathews  
Chem. Commun. 137 (1967)

"The Structure and Stereochemistry of Trichokaurin, a New Diterpenoid from Isodon trichocarpus Kudo"  
E. Fujita, T. Fujita, and M. Shibuya  
Chem. Commun. 148 (1967)

"The Base-catalysed Isomerisation of 2-Acetylmino-3-phenacylthiazolidine"  
G. R. Bedford, P. Doyle, M. C. Southern, and R. W. Turner  
Chem. Commun. 155 (1967)

"Heptafluoro-n-propyl Derivatives of Boron"  
T. Chivers  
Chem. Commun. 157 (1967)

"Magnetic Nonequivalence of an Isopropyl Group due to Steric Hindrance"  
B. Halpern, J. W. Westley, and B. Weinstein  
Chem. Commun. 160 (1967)

"Configuration of the Epoxide in Palmarin: a Case of Immoderate Conformational Distortion"  
K. M. S. Islam, G. Ferguson, K. H. Overton, and D. W. Melville  
Chem. Commun. 167 (1967)

"An Instance of a Stereoselective Isotopic Exchange Reaction"  
E. Bullock, J. M. W. Scott, and P. D. Golding  
Chem. Commun. 168 (1967)

"The Study of the Conformational Behaviour of tri-o-carvacrotide by Nuclear Magnetic Resonance Spectroscopy"  
A. P. Downing, W. D. Ollis, and I. O. Sutherland  
Chem. Commun. 171 (1967)

"The Formation of Cycl[3,2,2]azines from Pyridines and Methyl Propiolate"  
R. M. Acheson and D. A. Robinson  
Chem. Commun. 175 (1967)

"The  $^1\text{H}$  Nuclear Magnetic Resonance Spectra and Conformations of *cis*- and *trans*-Decahydroquinoline"  
H. Booth and A. H. Bostock  
Chem. Commun. 177 (1967)

"Conformational Free Energy of the Formyl Group as Determined by  $^1\text{H}$  Nuclear Magnetic Resonance"  
G. W. Buchanan and J. B. Stothers  
Chem. Commun. 179 (1967)

"Chamigrene, a Sesquiterpene Hydrocarbon of a Novel Carbon Skeleton"  
S. Ito, K. Endo, T. Yoshida, M. Yatagai, and M. Kodama  
Chem. Commun. 186 (1967)

"The Total Synthesis of (+)-Chamigrene"  
A. Tanaka, H. Uda, and A. Yoshikoshi  
Chem. Commun. 188 (1967)

"The Photolysis of Aldrin"  
J. D. Rosen  
Chem. Commun. 189 (1967)

"Crotonin, a Furanoid Norditerpene from Croton lucidus L."  
W. R. Chan, D. R. Taylor and C. R. Willis  
Chem. Commun. 191 (1967)

"Nonequivalence of Methylene Protons in Asymmetric Ethyl Esters"  
E. Bullock, E. E. Burnell and B. Gregory  
Chem. Commun. 193 (1967)

"A New Photochemical Rearrangement of  $\beta,\gamma$ -Unsaturated Cyclic Ketones"  
J. R. Williams and H. Ziffer  
Chem. Commun. 194 (1967)

"The Degradation of Resorcinol"  
C. J. Moye  
Chem. Commun. 196 (1967)

"Occurrence of D-2-Hydroxystericulic Acid in Pachira and Bombacopsis Seed Oils"  
L. J. Morris and S. W. Hall  
Chem. Ind. (London) 32 (1967)

"Nuclear Magnetic Resonance of Microsamples"  
D. J. Frost and G. E. Hall  
Chem. Ind. (London) 116 (1967)

"The Schmidt Reaction with 4-Cholestene-3,6-Dione"  
H. Singh and S. Padmanabhan, and A. K. Bose and I. Kugajevsky  
Chem. Ind. (London) 118 (1967)

"Orientation in the Mannich Reaction"  
G. L. Buchanan and A. C. W. Curran  
Chem. Ind. (London) 156 (1967)

"Vinyl Isocyanide"  
D. S. Matteson and R. A. Bailey  
Chem. Ind. (London) 191 (1967)

"A New Synthesis of Carbohydrate Imidazoline Derivatives"  
M. H. Fischer  
Chem. Ind. (London) 192 (1967)

"Interaction of Dithizone with Allegedly "Purified" Dioxan"  
H. M. N. H. Irving and U. S. Mahnot  
Chem. Ind. (London) 193 (1967)

"Nuclear Magnetic Resonance in Biochemistry"  
J. A. Glasel  
Chemistry (The Chinese Chem. Soc., Taiwan, China) A22, (1966)

"Phenol Oxidation and Biosynthesis. Part XII. Stereochemical Studies Related to the Biosynthesis of the Morphine Alkaloids"  
D. H. R. Barton, D. S. Bhakuni, R. James, and G.W.Kirby  
J. Chem. Soc., C, Org. 128 (1967)

"Mechanism of Hydrogenation. Part VI. Configurational Inversion in the Hydrogenolysis of Benzyl Alcohol Derivatives"  
A. M.Khan, F. J. McQuillin and in part I. Jardine  
J. Chem. Soc., C, Org. 136 (1967)

"The Reaction of Tetralones and their Enamines with Cyanogen Halides: a New Synthesis of 2-Naphthylamines"  
R. T. Parfitt  
J. Chem. Soc., C, Org. 140 (1967)

"A Cyclic Photoproduct from Phorone"  
P. J. Kropp and T. W.Gibson  
J. Chem. Soc., C, Org. 143 (1967)

"Constituents of Sneezewood, Ptaeroxylon Obliquum (Thunb.) Radlk. Part I. Chromones"  
P.H. McCabe, R. McCrindle and R. D. H. Murray  
J. Chem. Soc., C, Org. 145 (1967)

"Synthetic Studies Related To Franklinone and Acid-catalysed Rearrangements of Pyronochromanone Derivatives"  
A. Jefferson, I. Moore, and F.Scheinmann  
J. Chem. Soc., C, Org. 151 (1967)

"Phytochemical Studies. Part V. The Synthesis of Taiwanin A"  
G. A. Swoboda, K.-T. Wang, and B. Weinstein  
J. Chem. Soc., C, Org. 161 (1967)

"West African Timbers. Part XIX. The Structure of Methyl Angolensate, a Ring-*seco* Tetrnor-tetracyclic Triterpene of the Meliacin Family"  
C. W.L. Bevan, J. W. Powell and D. A. H. Taylor, and T. G. Halsall, P. Toft, and M. Welford  
J. Chem. Soc., C, Org. 163 (1967)

"Extractives from Cedrela odorata L. The Structure of Methyl Angolensate"  
W. R. Chan, K. E. Magnus, and B. S. Mootoo  
J. Chem. Soc., C, Org. 171 (1967)

"Hydroxy-steroids. Part IX. The Nuclear Magnetic Resonances of Angular Methyl Groups in Steroid Ketones"  
P. C. Cherry, W. R. T.Cottrell, G. D. Meakins, and (Mrs.) E. E.Richards  
J. Chem. Soc., C, Org. 181 (1967)

"Redistribution Reactions in Polymeric Alkyl Silicates"  
D. Grant  
J. Inorg. Nucl. Chem. 29, 69 (1967)

"Proton Magnetic Resonance Studies and Extraction Properties of Some Simple Diamides"  
T. H. Siddall, III and M. L.Good  
J. Inorg. Nucl. Chem. 29, 149 (1967)

"Preparation and Properties of Monosubstituted Triethylamine-Boranes"  
J. N. G. Faulks, N. N. Greenwood and J. H. Morris  
J. Inorg. Nucl. Chem. 29, 329 (1967)

"The Structure of the Condensation Product of 1,1,1-Tris(Aminomethyl)Ethane with Pyridine -2-Aldehyde, Its Complexes with Lanthanide Nitrates and Its Isomerization in the Presence of Ferrous Ion"  
D. A. Durham, F. A. Hart and D. Shaw  
J. Inorg. Nucl. Chem. 29, 509 (1967)

"Isolation and Analysis of Free Fatty Aldehydes From Rat, Dog, and Bovine Heart Muscle"  
J. R. Gilbertson, W. J. Ferrell, and R. A. Gelman  
J. Lipid Res. 8, 38 (1967)

"Synthesis of Glycerol 1,3-Dihexadecyl Ether"  
R. Damico, R. C. Callahan, and F. H. Mattson  
J. Lipid Res. 8, 63 (1967)

"Tetrahydro-2H-1,3,4-oxadiazines. I. Ring-Chain Tautomerism of 2-Alky-4,5-dimethyl-6-phenyltetrahydro-2H-1,3,4-oxadiazines"  
L. C.Dorman  
J. Org. Chem. 32, 255 (1967)

"Alkylation of syn- and anti-Benzaldoximes"  
E. Buehler  
J. Org. Chem. 32, 261 (1967)

"Steric Inhibition of Resonance in the Two Diastereoisomeric 4-t-Butyl-N-methyl-N-phenylcyclohexylamines"  
G. Bellucci and G. Berti  
J. Org. Chem. 32, 268 (1967)

"The Reaction of Grignard Reagents with N,N-Dialkyl-N-(phenylthiomethyl)amines"  
I. E. Pollak, A. D. Trifunac, and G. F.Grillot  
J. Org. Chem. 32, 272 (1967)

"The Reactions of Allylamines with Dichlorocarbene"  
W. E. Parham and J. R. Potoski  
J. Org. Chem. 32, 275 (1967)

"The Reaction of Allylamines with Phenyl(trichloromethyl)mercury"  
W. E. Parham and J. R.Potoski  
J. Org. Chem. 32, 278 (1967)

"Rearrangements and Ring Expansions during the Deoxygenation of  $\beta,\beta$ -Disubstituted o-Nitrostyrenes"  
R. J. Sunberg and T. Yamazaki  
J. Org. Chem. 32, 290 (1967)

"Sulfinate Esters. II. The Synthetic Utility of Methyl Methanesulfinate"  
I. B.Douglass, F. J. Ward and R. V. Norton  
J. Org. Chem. 32, 324 (1967)

"The Photolysis of Diazomethane and Ethyl Diazoacetate in the Presence of 4-Octyne"  
H. Lind and A. J. Deutschman, Jr.  
J. Org. Chem. 32, 326 (1967)

"The Reaction of 4-Phenyl-1,2,4-triazoline-3,5-dione with Conjugated Dienes"  
B. T. Gillis and J. D. Hagarty  
J. Org. Chem. 32, 330 (1967)

"The Reaction of Triphenylphosphine with Peroxycyclohexadienones"  
W. H.Starnes, Jr., and N. P. Neutreiter  
J. Org. Chem. 32, 333 (1967)

"A New Synthesis of 3-Methylcyclopent-2-en-2-ol-1-one"  
K. Sato, S. Suzuki, and Y. Kojima  
J. Org. Chem. 32, 339 (1967)

"Free-Radical Chain Addition Reactions of Aldehydes with Perfluoro Ketones and Chloro Perfluoro Ketones"  
W.H. Urry, A. Nishihara, and J. H. Y. Niu  
J. Org. Chem. 32, 347 (1967)

"The Synthesis of 17-Disubstituted Steroids by the Claisen Rearrangement"  
D. F. Morrow, T. P. Culbertson and R. M.Hofer  
J. Org. Chem. 32, 361 (1967)

"Meccanismo di polimerizzazione stereospecifica dell'  $\alpha$ -olefina a polimeri isotattici in presenza di sistemi catalitici bimetallici. Nota II—Stereospecificità di alcuni sistemi catalitici eterogenei"  
G. Natta, A. Zambelli, I. Pasquon, G. M. Giongo  
Chim. Ind. (Milan) 48, 1307 (1966)

"Lucensomicina e pimaricina: determinazione della configurazione assoluta dell'atomo di carbonio su cui si chiude l'anello lattonico"  
G. Gaudiano, P. Bravo, and G. Mauri  
Chim. Ind. (Milan) 48, 1327 (1966)

"Comparaison des spectres de résonance magnétique nucléaire de d'absorption infrarouge de composés hétérocycliques"  
M. Chalaye  
Compt. Rend. Ser. B, 263, 1227 (1966)

"Résonance et relaxation nucléaire dans les hexafluorures de molybdène, de tungstène et d'uranium liquides"  
P. Rigny et A. Demortier  
Compt. Rend., Ser. B, 263, 1408 (1966)

"Sur l'acylation des alcoyl-3 cyclohexanones.  
G. Descotes et Y. Quérout  
Compt. Rend. Ser. C 263, 1231 (1966)

"Synthèse  $\Delta^{(3,9)}$ -hydrindène-ones-4 et d'hydrindanones-4"  
F. Weißbuch  
Compt. Rend. Ser. C 263, 1234 (1966)

"Sur la synthèse d'indoles et d'aminocétones par déshydrogénération catalytique de N-alcoyl N-aryl amino-1 propanols-2"  
A. Verdier, J. Bonnet et A. Lattes  
Compt. Rend. Ser. C, 263, 1240 (1966)

"C et O-alcoylation du benzoyl-9 fluorène"  
J.-P. Boisset, J. Boyer et J. Rouzaud  
Compt. Rend., Ser. C, 263, 1253 (1966)

Synthèse de la thiazolo-(4.5-d) pyridazine et de quelques dérivés"  
M. Robba et Y. Le Guen  
Compt. Rend., Ser. C, 263, 1385 (1966)

"Action du chlore sur l'isonitrosoacetone et comportement de quelques oximes de chlorure d'acide carboxylique"  
J. Armand, J.-P. Guette et F. Valentini  
Compt. Rend., Ser. C, 263, 1388 (1966)

"Étude sur modèles de réactions des cis et trans-1,4 polybutadiénés. Halogénations et déhydrohalogénations des cyclododecatriènes-1.5.9."  
C. Pinazzi, A. Pleurdeau et H. Gueniffey  
Compt. Rend., C, 264, 60 (1967)

"A Spectral Study of Some 2,6-Diaryl-4-Pyrone"  
H. C. Smitherman  
Dissertation Abstr., B, 27, 1383 (1966)

"The Chemistry of Vitamin B<sub>12</sub>"  
J. A. Knowles III.  
Dissertation Abstr., B, 27, 1385 (1966)

"I. Organophosphides as Nucleophilic Agents: Aryl Halide Replacement in Non-Activated Systems. II. Synthesis and Reactions of Cyclic Poly-Phosphonium Salts"  
H. G. Aguiar  
Dissertation Abstr., B, 27, 1407 (1966)

"The Synthesis of as-Triazine and the Synthesis and Bromination of Some Imidazo[1,2-b]-as-Triazines"  
J. M. Barton  
Dissertation Abstr., B, 27, 1408 (1966)

"Anodic Oxidations of Medium Ring Cycloalkanecarboxylic Acids"  
J. S. Dehn  
Dissertation Abstr., B, 27, 1412 (1966)

"The Data on the Conformations of Hexamethylbenzene"  
M. S. Frankovsky  
Dissertation Abstr., B, 27, 1414 (1966)

"Applications of Nuclear Magnetic Resonance Spectroscopy to the Study of Medium-sized Rings: I. Conformational Properties of Cycloheptane. II. Conformational Properties of Cyclooctane"  
E. S. Glazer  
Dissertation Abstr., B, 27, 1415 (1966)

"Studies of Tricyclo[3.3.0.0<sup>2,6</sup>]Octane"  
B. E. Kaplan  
Dissertation Abstr., B, 27, 1417 (1966)

"Studies on the Syntheses and Chemistry of  $\beta$ -Hydroxy-phenethylamines and Related Phenylserines of Possible Psychotomimetic Interest"  
K. N. Parameswaran  
Dissertation Abstr., B, 27, 1425 (1966)

"Intramolecular Additions of Organometallic Reagents to Double Bonds"  
T. C. Rees  
Dissertation Abstr., B, 27, 1426 (1966)

"Acid Catalyzed Rearrangement of Phenylcyclopropylglycolic Acid; Synthesis and Cholinergic Effects of Ceratin N-Methoxylated Quaternary Compounds"  
L. L. Darko  
Dissertation Abstr., B, 27, 1434 (1966)

"Chemistry, NMR Spectra and Biological Activity of Certain Steroids"  
H. Lee  
Dissertation Abstr., B, 27, 1436 (1966)

"Use of a Pulsed Magnetic-Field Gradient for Measurements of Self-Diffusion by Spin-Echo Nuclear Magnetic Resonance with Applications to Restricted Diffusion in Several Tissues and Emulsions"  
J. E. Tanner, Jr.  
Dissertation Abstr., B, 27, 1447 (1966)

"Electron and Nuclear Relaxation in Manganese-Iron Spinels"  
T. G. Blocker, III.  
Dissertation Abstr., B, 27, 1585 (1966)

"Nuclear Magnetic Resonance in Metals"  
G. A. Matzkanin  
Dissertation Abstr., B, 27, 1590 (1966)

"Magnetic Resonance of Pure and Doped Single Crystals of Hematite"  
C. W. Searle  
Dissertation Abstr., B, 27, 1592 (1966)

"Products of the Oxidation of Diisobutylene"  
L. I. Antsus  
Dokl.—Chem. Sect. (English Transl.) 166, 153 (1966)

"NMR Spectra of Cyclopentadienyl Derivatives of Mercury"  
G. G. Dvoryantseva, K. F. Turchin, R. B. Materikova,  
Yu. N. Sheinker, and Academician A. N. Nesmeyanov  
Dokl.—Chem. Sect. (English Transl.) 166, 165 (1966)

"Cyclopropanes and Cyclopropenes. Nuclear Magnetic Resonance Spectra"  
R. R. Kostikov, V. B. Lebedev, and I. A. D'yakonov  
Dokl.—Chem. Sect. (English Transl.) 166, 253 (1966)

"7 $\alpha$ -Methylösstogene"  
J. Kalvoda, Ch. Krähenbühl, P. A. Desaulles und G. Anner  
Helv. Chim. Acta 50, 281 (1967)

"Photochemische Reaktionen. Photochemische Umwandlungen von endo-Tricyclo[4.3.1<sup>2,5</sup>.0]-decadien-(3,8)-dion-(7,10) und cis-8,9-Dihydroindenor"  
E. Baggolini, E. G. Herzog, S. Iwasaki, R. Schorta und K. Schaffner  
Helv. Chim. Acta 50, 297 (1967)

"Recherches dans la serie des cyclitols XXXIV. Sur le complexe diborique du scyllitol"  
Th. Posternak, E. A.C. Lucken et A. Szente  
Helv. Chim. Acta 50, 326 (1967)

"Recherches sur la formation et la transformation des esters LXXII. Aryl(ou aralcoyl ou alcoyl)amino-2-tetrahydro-m-thiazines ou aryl(ou aralcoyl ou alcoyl)amino-2-dihydro- $\Delta^2$ -m-thiazines et derives"  
E. Cherbuliez, Br. Baehler, O. Espejo, H. Jindra, B. Willhalm, et J. Rabinowitz  
Helv. Chim. Acta 50, 331 (1967)

"Analysis of a Microwave Amplifier Using the Electro-optic Junction Modulator"  
L. A. D'Asaro  
IEEE J. Quantum Electronics QE-2, 693 (1966)

"Terpenoids: Part LXXVII—Synthesis of Tetrahydroelemol"  
L. J. Patil, K. S. Kulkarni & A. S. Rao  
Indian J. Chem. 4, 400 (1966)

"Colouring Matters of the Wood of Artocarpus heterophyllus: Part IV — Constitution of Artocarpesin & Norartocarpesin, & Synthesis of Dihydroartocarpesin Tetramethyl Ether"  
P. V. Radhakrishnan and A. V. Rama Rao  
Indian J. Chem. 4, 406 (1966)

"Reinvestigation of Nuclear Magnetic Resonance Spectrum of Epichlorohydrin"  
G. Aruldas and V. Unnikrishnan Nayar  
Indian J. Pure Appl. Phys. 4, 361 (1966)

"Nuclear Magnetic Resonance Spectrum of Azulene: Calculation of Chemical Shifts by Johnson & Bovey's Method"  
J. S. M. Sarma  
Indian J. Pure Appl. Phys. 4, 365 (1966)

"Tautomerism Exchange in  $B_3H_7 \cdot N(CH_3)_3$  and  $B_3H_7 \cdot THF$ "  
M. A. Ring, E. F. Witucki and R. C. Greenough  
Inorg. Chem. 6, 395 (1967)

"Über das Azyldifluorosulfation  $NSF_2O^-$ "  
H. W. Roesky, O. Clemser, A. Hoff und W. Koch  
Inorg. Nucl. Chem. Letters 3, 39 (1967)

"Synthesis of 1,2,2 - Trimethylazacyclodecane"  
S. W. Breuer and D. Ginsburg  
Israel J. Chem. 4, 145 (1966)

"Catalyst-Controlled Monomer Distributions in Copolymers. Copolymerization of Propylene Oxide and Maleic Anhydride"  
R. J. Kern and J. Schaefer  
J. Am. Chem. Soc. 89, 6 (1967)

"A Nuclear Magnetic Resonance Investigation of the Aggregation of Acridine Orange in Aqueous Solution"  
D. J. Blears and S. S. Danyluk  
J. Am. Chem. Soc. 89, 21 (1967)

"The Existence of Monomethylthallium (III) Species"  
H. Kuroawa and R. Okawara  
Inorg. Nucl. Chem. Letters 3, 21 (1967)

"Isolation of Dimethyltin 8-Hydroxyquinolinate Tropolonate and the Ligand-Exchange in Solution"  
M. Komura, T. Tanaka, T. Mukai and R. Okawara  
Inorg. Nucl. Chem. Letters 3, 17 (1967)

"On the Temperature Dependence of the NMR Spectra of  $Cl_2Sn(acac)_2$ "  
Y. Kawasaki and T. Tanaka  
Inorg. Nucl. Chem. Letters 3, 13 (1967)

"Spin Delocalization in Substituted Anilines Complexed with Bis(2,4-pentanedionato)nickel(II)"  
R. W. Kluiber and W. DeW Horrocks, Jr.  
Inorg. Chem. 6, 430 (1967)

"New Rhodium Chelates of Hexafluoroacetylacetone"  
S. C. Chatteraj and R. E. Sievers  
Inorg. Chem. 6, 408 (1967)

"A Phosphorus-31 Nuclear Magnetic Resonance Study on the Phosphorus-Iodine System"  
R. L. Carroll and R. E. Carter  
Inorg. Chem. 6, 401 (1967)

"Stereospecific  $\alpha$ -Hydrogen Exchange in Camphor, Isofenchone, and Carvonecamphor"  
A. F. Thomas, R. A. Schneider, and J. Meinwald  
J. Am. Chem. Soc. 89, 68 (1967)

"Stereospecific Hydrogen Transfer in the Photolysis of Carvonecamphor"  
J. Meinwald, R. A. Schneider, and A. F. Thomas  
J. Am. Chem. Soc. 89, 70 (1967)

"Nuclear Magentic Resonance Studies of Rate Processes and Conformations. V. Synchronous Inversion at Two Nitrogens"  
J. E. Anderson and J. M. Lehn  
J. Am. Chem. Soc. 89, 81 (1967)

"Nuclear Magnetic Resonance Spectroscopy. Conformational Properties of Substituted 1,1-Difluorocyclohexanes"  
S. L. Spassov, D. L. Griffith, E. S. Glazer, K. Nagarajan, and J. D. Roberts  
J. Am. Chem. Soc. 89, 88 (1967)

"Preferred Conformations of the Cycloheptane Rings of A-Homosteroids"  
J. B. Jones, J. M. Zander, and P. Price  
J. Am. Chem. Soc. 89, 94 (1967)

"Concerning the Mechanism of the Photodeamination of 2-Benzoylaziridines"  
A. Padwa and L. Hamilton  
J. Am. Chem. Soc. 89, 102 (1967)

"The Kinetic Hydrogen Isotope Effects in the Bromination of Some Polyalkylbenzene Systems"  
E. Baciocchi, G. Illuminati, G. Sleiter and F. Stegel  
J. Am. Chem. Soc. 89, 125 (1967)

"Dimethylsulfonium Phenacylide"  
B. M. Trost  
J. Am. Chem. Soc. 89, 138 (1967)

"The Synthesis of Bicyclo[4.2.2]deca-2,4,7,9-tetraene. New Sources of cis- and trans-9,10-Dihydronaphthalene and Bullvalene"  
M. Jones, Jr., and L. T. Scott  
J. Am. Chem. Soc. 89, 150 (1967)

"Synthesis of a Triquinocyclopropane"  
R. West, and D. C. Zecher  
J. Am. Chem. Soc. 89, 152 (1967)

"Extractives from Guttiferae. Part IV. Isolation and Structure of Ugaxanthone and Mbarraxanthone from *Sympmania globulifera* L"  
H. D. Locksley, I. Moore, and F. Scheinmann  
J. Chem. Soc., C, Org. 2265 (1966)

"Oxidation of Alkoxyphenols. Part VIII. Further Examples of Trimerisation to Spiroketals"  
D. F. Bowman, F. R. Hewgill and B. R. Kennedy  
J. Chem. Soc., C, Org. 2274 (1966)

"Nitrone. Part III. Photolysis of Cyclic Nitrone"  
L. S. Kaminsky and M. Lamchen  
J. Chem. Soc., C, Org. 2295 (1966)

"Nitrone. Part IV. Synthesis and Properties of a Monocyclic  $\alpha$ -Dinitrone"  
M. Lamchen and T. W. Mittag  
J. Chem. Soc., C, Org. 2300 (1966)

"Studies in Azide Chemistry. Part I. Synthesis of Perfluoropropenyl Azide and its Conversion into Perfluoro-(2- and 2-methyl-2H-azirine)"  
R. E. Banks and G. J. Moore  
J. Chem. Soc., C, Org. 2304 (1966)

"Phenol Oxidation and Biosynthesis. Part XI. The Structure of Stebisimine and the Biosynthesis of Epistephanine"  
D. H. R. Barton, G. W. Kirby, and A. Wiechers  
J. Chem. Soc., C, Org. 2313 (1966)

"Reactions of Cyclohexadienes. Part VI. Further Reactions of Diels-Alder Adducts from 1-Methoxycyclohexadienes"  
A. J. Birch and J. S. Hill  
J. Chem. Soc., C, 2324 (1966)

"Unsaturated Carbohydrates. Part VI. A Modified Synthesis of 2-Hydroxyglycal Esters, and their Conversion into Esters of 2,3-Dihydro-3-deoxyaldoses"  
R. J. Ferrier and G. H. Sankey  
J. Chem. Soc., C, Org. 2339 (1966)

"Polyfluoroheterocyclic Compounds. Part VIII. Nucleophilic Substitution in Heptafluoro-quinoline and -isoquinoline"  
R. D. Chambers, M. Hole, W. K. R. Musgrave, R. A. Storey and (in part) B. Iddon  
J. Chem. Soc., C, Org. 2331 (1966)

"Unsaturated Carbohydrates. Part VII. The Preference Shown by Allylic Ester Groupings on Pyranoid Rings for the quasi-Axial Orientation"  
R. J. Ferrier and G. H. Sankey  
J. Chem. Soc., C, Org. 2345 (1966)

"Steroids. Part XXVII. Modification of 14 $\alpha$ -Methyl Group in 4,4,14 $\alpha$ -Trimethylsteroids"  
C. W. Shoppee, N. W. Hughes, and R. E. Lack  
J. Chem. Soc., C, Org. 2359 (1966)

"Formation of Ethyl 1,5-Dideoxy-5-ethylthio-1-mercaptop- $\alpha$ - and - $\beta$ -L-arabinofuranosides by an Intramolecular Displacement of 5-O-Toluene-p-sulphonyl-L-arabinose diethyl dithioacetal"  
N. A. Hughes and R. Robson  
J. Chem. Soc., C, Org. 2366 (1966)

"Multimacrocyclic Compounds. Part I. Novel Triply Bridged Dibenzoid Cage Compounds"  
A. J. Hubert  
J. Chem. Soc., C, Org. 6 (1967)

"Multimacrocyclic Compounds. Part II. Pentabenzenoid Cage Compounds"  
A. J. Hubert  
J. Chem. Soc., C, Org. 11 (1967)

"The Photodimer of p-Benzoquinone"  
E. H. Gold and D. Ginsburg  
J. Chem. Soc., C, Org. 15 (1967)

"2-Trihalogenomethylbenzazoles. Part II. Reactions of 2-Trihalogenomethylbenzimidazoles with Ammonia and Amines"  
G. Holan and (Mrs.) E. L. Samuel  
J. Chem. Soc., C, Org. 25 (1967)

"2-Trihalogenomethylbenzazoles. Part III. Reactions of 2-Trichloromethylbenzimidazole with Nucleophiles"  
B. C. Ennis, G. Holan, and (Mrs.) E. L. Samuel  
J. Chem. Soc., C, Org. 30 (1967)

"2-Trihalogenomethylbenzazoles. Part IV. Reactions with Difunctional Nucleophiles. Formation of Heterocyclic Rings on the 2-Position of Benzazoles"  
B. C. Ennis, G. Holan, and (Mrs.) E. L. Samuel  
J. Chem. Soc., C, Org. 33 (1967)

"Polyfluoroarenes. Part VIII. Some Homolytic Reactions of Pentafluoriodobenzene"  
J. M. Birchall, R. Hazard, R. N. Haszeldine, and (in Part) W. W. Wakalski  
J. Chem. Soc., C, Org. 47 (1967)

"Polyfluoroheterocyclic Compounds. Part IX. Tautomerism in Polyfluorohydroxy-quinolines and -isoquinolines"  
R. D. Chambers, M. Hole, W. K. R. Musgrave and R. A. Storey  
J. Chem. Soc., C, Org. 53 (1967)

"Azabenzyloheptenones. Part VI. Preparation and Some Reactions of 1,2,4,5-Tetrahydro-1-oxo-3-toluene-p-sulphonylbenz[d]azepine"  
M. A. Rehman  
J. Chem. Soc., C, Org. 58 (1967)

"The Use of Periodate-Oxidised Glycosides in the Robinson-Schöpf Condensation: Some Analogues of 9-Methyl-3-Oxaganatan-7-one"  
R. D. Guthrie and J. F. McCarthy  
J. Chem. Soc., C, Org. 62 (1967)

"Pyrroles and Related Compounds. Part XI. Synthesis of Two Acetamidoethyl Porphyrins and their Conversion into Vinyl Porphyrins and Chlorins"  
G. L. Collier, A. H. Jackson, and G. W. Kenner  
J. Chem. Soc., C, Org. 66 (1967)

"Sulphonhydrazides and Related Compounds. Part VII. Some Substituted Sulphanilyl Hydrazides"  
R. J. W. Cremlin  
J. Chem. Soc., C, Org. 77 (1967)

"The Formation of Chromanone-type Systems via the Acylation of Derivatives of 2,6-Dihydroxyanthracene"  
D. W. Cameron and P. E. Schütz  
J. Chem. Soc., C, Org. 95 (1967)

"Some Acyl Derivatives of 2,6-Dimethoxyanthracene"  
D. W. Cameron, D. G. I. Kingston, and P. E. Schütz  
J. Chem. Soc., C, Org. 99 (1967)

"Bridged Ring Systems. Part X. The Reductive Rearrangement of  $\delta$ -Enol-lactones"  
J. Martin, W. Parker, B. Shroot, and T. Stewart  
J. Chem. Soc., C, 101 (1967)

"Steric Aspects of the Intramolecular Cyclisation of 2-Arylcyclohexylacetic Acids. Part III."  
S. Bien, U. Michael, and L. (Cohen) Zamir  
J. Chem. Soc., C, Org. 115 (1967)

"Reactions of Cyclohexadienes. Part VII. A Diels-Alder Adduct of a Tetrahydropyranoyloxyhexadiene"  
A. J. Birch and J. S. Hill  
J. Chem. Soc., C, Org. 125 (1967)

"Use of Ethoxyacetylene for the Synthesis of N-Protected Amino-acids"  
G. R. Banks, D. Cohen, G. E. Pattenden, and J. A. G. Thomas  
J. Chem. Soc., C, Org. 126 (1967)

"NMR Free-Radical Decay in a Two-Spin System"  
W. I. Goldburg, D. Tee, M. Lee and I.J. Lowe  
Bull. Am. Phys. Soc. 12, 59 (1967)

"New Scheme for the Construction of Phase Shifts with Application to NMR"  
D. O. Van Ostenburg and L. C. R. Alfred  
Bull. Am. Phys. Soc. 12, 59 (1967)

"Automated Data Acquisition System for Nuclear Spin-Lattice Relaxation-Time Measurements"  
E. Tward (introduced by B.P. Stoicheff) and R. L. Armstrong  
Bull. Am. Phys. Soc. 12, 59 (1967)

"Scalar Electron-Coupled Spin-Spin Interaction in HD"  
I. Ozier, P.-n. Yi, A. Khosla and N. F. Ramsey  
Bull. Am. Phys. Soc. 12, 132 (1967)

"High-Resolution NMR Spectra of Pentacyclic Hydrocarbons"  
T. B. Cobb (introduced by J. D. Memory) and J. D. Memory  
Bull. Am. Phys. Soc. 12, 132 (1967)

"Nuclear Magnetic Resonance Spectra of Organophosphorus Compounds. I. Long-range Coupling between Phosphorus and Proton through Four Bonds"  
K. Takahashi, T. Yamasaki and G. Miyazima  
Bull. Chem. Soc. Japan 39, 2787 (1966)

"Etudes en série néopentylique. V. — Influence du Milieu sur la vitesse de réaction d'amines avec le tosylate de néopentyle"  
J. Seyden-Penne et B. Danréé  
Bull. Soc. Chim. France 3086 (1966)

"Contribution à l'étude des hétérocycles soufrés condensés. XXI.—Dérivés halogénés dans la série du benzo[b]thiophène"  
P. Cagniant, P. Faller et D. Cagniant  
Bull. Soc. Chim. France 3055 (1966)

"Oxydation du propène par les sels mercuriques en solution aqueuse acide. II. — Étude du mécanisme de la réaction"  
J.-C. Strini et J. Metzger  
Bull. Soc. Chim. France 3150 (1966)

"Polymérisation anionique des diènes sous l'influence des produits d'insertion de métaux alcalins dans le graphite"  
C. Stein et J. Golé  
Bull. Soc. Chim. France 3175 (1966)

"Composés organiques sulfures. XIII. — Condensation du sulfure de carbone et des dithiole-1,2 thiones-3 possédant un méthylène en  $\alpha$  du carbone"  
C. Portail et J. Vialle  
Bull. Soc. Chim. France 3187 (1966)

"Transpositions acidocatalysées: XVI. mémoire. Étude des réactions de Ritter et de Koch et Haaf sur le spiro (4,4) nonanol-1, les hydrindanols-8, les diméthyl-2,2 cyclohexanols"  
H. Christol et G. Solladié  
Bull. Soc. Chim. France 3193 (1966)

"Alcaloïdes stéroïdiques. LIII. — Synthèse de la dihydro-4,5 hydroxy-18 progestérone et de la nor-18 hydroxy-13 dihydro-4,5 progestérone à partir de la conessine"  
M.-M. Janot, X. Lusinchi, L. Labler et R. Goutarel  
Bull. Soc. Chim. France 3276 (1966)

"Étude par résonance magnétique nucléaire de dérivés polyéniques apparentés à la vitamine A. 1<sup>re</sup> partie: Signaux des groupements méthyles"  
M. Mousseron-Canet et J.-C. Mani  
Bull. Soc. Chim. France 3285 (1966)

"Étude par résonance magnétique nucléaire de dérivés polyéniques apparentés à la vitamine A. 2<sup>e</sup> partie: Signaux des protons fonctionnels et oléfiniques"  
M. Mousseron-Canet et J.-C. Mani  
Bull. Soc. Chim. France 3291 (1966)

"Sur la constitution chimique du kitol, kimére de la vitamine A."  
C. Giannotti, B. C. Das et E. Lederer  
Bull. Soc. Chim. France 3299 (1966)

"Chlorhydrines hétérocycliques. I. Étude de l'acide hypochloreux sur les éthers vinyliques cycliques"  
R. Aguilera et G. Descotes  
Bull. Soc. Chim. France 3318 (1966)

"Chlorhydrines hétérocycliques. II. — Action des amines secondaires sur le chloro-3 hydroxy-2 tétrahydropyranne"  
R. Aguilera et G. Descotes  
Bull. Soc. Chim. France 3323 (1966)

"Séparation de thiocétones et d'éne-thiols isomères"  
C. Demuyck, M. Demuyck, D. Paquer et J. Vialle  
Bull. Soc. Chim. France 3366 (1966)

"Dérivés aminés en 16 de la série oxydo-18,20 R pregnane- $\beta\alpha$ ; réaction de transfert intramoléculaire d'un ion hydrique (3<sup>e</sup> partie). Alcaloïdes stéroïdiques du Paravallaris microphylla Pittard (Apocynacées) (13<sup>e</sup> mémoire)"  
H.-P. Husson, J. De Rostolan, P. Potier et J. Le Men  
Bull. Soc. Chim. France 3379 (1966)

A. A. B.

"Additions radicalaires. I. — Addition du cyanoacétate d'éthyle et de nitriles aliphatiques sur le  $\beta$ -pinène"  
M. Cazaux et R. Lalande  
Bull. Soc. Chim. France 3381 (1966)

"Additions radicalaires. II. — Addition d'esters maloniques, d'acides aliphatiques et de leurs anhydrides sur le  $\beta$ -pinène"  
J. Moulines et R. Lalande  
Bull. Soc. Chim. France 3387 (1966)

"Stéroïdes portant un noyau oxazole accolé aux carbones 2 et 3 ou 3 et 4"  
B. Firer, S. Julia et C. P. Papantoniu  
Bull. Soc. Chim. France 3407 (1966)

"Stéroïdes portant un noyau oxazolone accolé aux carbones 3 et 4"  
S. Julia et C. P. Papantoniu  
Bull. Soc. Chim. France 3410 (1966)

"Essai di détermination de la conformation de quelques hydroxyméthyl-2 décabdroisoquinoléines"  
S. Durand-Henchoz et R. C. Moreau  
Bull. Soc. Chim. France 3428 (1966)

"Effets de solvant et règles de Zürcher en résonance magnétique nucléaire"  
M. Fétilzon et J.-C. Gramain  
Bull. Soc. Chim. France 3444 (1966)

"Structure de l'acide tormentique, acide triterpénique pentacyclique isolé des racines de Potentilla tormentilla Neck. (Rosacées)"  
P. Potier, B. C. Das, A.M. Bui, M.-M. Janot A. Pourrat et H. Pourrat  
Bull. Soc. Chim. France 3458 (1966)

"Recherches sur les composés sulfurés organiques. II.— Sulfuration de cinnamylidène acylacétates d'éthyle et de cinnamylidène diacylméthanés"  
N. K. Son, F. Clesse, H. Quiniou et N. Lozac'h  
Bull. Soc. Chim. France 3466 (1966)

"Alcaloïdes stéroïdiques, LV. Alcaloïdes du Dictyophleba lucida (K. Schum.) Pierre; Structures de la dictyô-lucidine et de la dictyolucidamine"  
M.-M. Janot, C. Monneret, X. Monseur, Q. Khuong-Huu et R. Goutarel  
Bull. Soc. Chim. France 3472 (1966)

"Alcaloïdes stéroïdiques LVI. Famille des Buxacées (8<sup>e</sup> communication). Alcaloïdes du Buxus balearica: structure de la N-3-isobutyryl cyclobuxine-F ('baléabuxine')"  
D. Herlem-Gaulier, F. Khuong-Huu-Lainé et M. Robert Boutil  
Bull. Soc. Chim. France 3478 (1966)

"Nonplanar Cyclobutane. I. The 3-Isopropylcyclobutyl System. Nuclear Magnetic Resonance Spectra of Alcohols and Amines"  
I. Lillien, R. A. Doughty  
J. Am. Chem. Soc. 89, 155 (1967)

"Stable Carbonium Ions. XXXII. Alkyldicarbonium Ions"  
J. M. Bollinger, C. A. Cupas, K. J. Friday, M. L. Woolfe, and G. A. Olah  
J. Am. Chem. Soc. 89, 156 (1967)

"<sup>27</sup>Al-<sup>1</sup>H Coupling and the Nature of LiAl(CH<sub>3</sub>)<sub>4</sub> Solutions"  
J. P. Oliver, and C. A. Wilkie  
J. Am. Chem. Soc. 89, 163 (1967)

"Intramolecular, Long-Range Oxidations at Saturated Carbon Centers"  
E. Wenkert, and B. L. Mylari  
J. Am. Chem. Soc. 89, 174 (1967)

"Laboratory Cyclization of Geranylgeranyl Acetate Terminal Epoxide"  
E. E. van Tamelen, and R. G. Nadeau  
J. Am. Chem. Soc. 89, 176 (1967)

"Dibenzo[b,e]tropone and Its Conjugate Acid"  
N. L. Bauld, Y. S. Rim  
J. Am. Chem. Soc. 89, 179 (1967)

"Bicyclo[6.2.0]deca-1,3,5,7-tetraene"  
J. A. Elix, M. V. Sargent, and F. Sondheimer  
J. Am. Chem. Soc. 89, 180 (1967)

"Rearrangements of Organic Fluoramides. Preparation of 3-Difluoroamino-2-fluoro-2-azacyclohexanone and 3-Fluoro-3-(3-carbomethoxypropyl)diazirine"  
T. E. Stevens, and W. H. Graham  
J. Am. Chem. Soc. 89, 182 (1967)

"Chemistry of Metal Hydrides. II. Spectroscopic Studies of Fluorovinylplatinum(II) Derivatives"  
H. C. Clark and W. S. Tsang  
J. Am. Chem. Soc. 89, 533 (1967)

"The Configuration of Pyrazolone Azomethine Dyes"  
P. J. S. Pauwels  
J. Am. Chem. Soc. 89, 580 (1967)

"The Electrochemical Formation of Carbonium and Iodonium Ions from Alkyl and Aryl Iodides"  
L. L. Miller and A. K. Hoffmann  
J. Am. Chem. Soc. 89, 593 (1967)

"The Photocycloaddition of Benzophenone to Ketenimines"  
L. A. Singer and G. A. Davis  
J. Am. Chem. Soc. 89, 598 (1967)

"The Valence Isomerization of 1,2-Divinylaziridines. Synthetic and Kinetic Studies"  
E. L. Stogryn and S. J. Brois  
J. Am. Chem. Soc. 89, 605 (1967)

"The Polar Fluorination of Propenylbenzene"  
R. F. Merritt  
J. Am. Chem. Soc. 89, 609 (1967)

"Pyrolysis of Some Bridged Homotropilidene Systems"  
J. N. Labows, Jr., J. Meinwald, H. Röttele, and G. Schröder  
J. Am. Chem. Soc. 89, 612 (1967)

"Mechanisms of Nucleophilic Substitution of Propargyl and Allenyl Halides. Base-Promoted Reactions of 3-Bromo-3-methyl-1-butyne and 1-Bromo-3-methyl-1,2-butadiene in Aqueous Ethanol"  
V. J. Shiner, Jr., and J. S. Humphrey, Jr.  
J. Am. Chem. Soc. 89, 622 (1967)

"1,3 Acyl Migrations in Unsaturated Triad (Allyloid) Systems. Rearrangements of N-(2,4-Dinitrophenyl)benzimidoyl Benzoates"  
D. Y. Curtin and L. L. Miller  
J. Am. Chem. Soc. 89, 637 (1967)

"Reactions of Aryl(trichloromethyl)carbinols with Sulfur Nucleophiles. Formation and Proof of Zwitterionic Structure of Iminothiazolidinones"  
W. Reeve and M. Nees  
J. Am. Chem. Soc. 89, 647 (1967)

"Optical Rotatory Dispersion Studies. CVII. Factors Governing the Relative Stability of Hydrindanones. Syntheses of 17-Alkyl-15-keto Steroids"  
A. R. Van Horn and C. Djerassi  
J. Am. Chem. Soc. 89, 651 (1967)

"Biosynthesis of Tropolones in Penicillium stipitatum. VII. The Formation of Polyketide Lactones and Other Nontropolone Compounds as a Result of Ethionine Inhibition"  
R. Bentley and P. M. Zwitkowits  
J. Am. Chem. Soc. 89, 676 (1967)

"Acidity of Hydrocarbons. XXIV. Proton Exchange of 9-Substituted Fluorenes with Methanolic Sodium Methoxide. Stabilization of 9-Trifluoromethylfluorenol Anion by Inductive Effects"  
A. Streitwieser, Jr., A. P. Marchand, A. H. Pudjaatmaka  
J. Am. Chem. Soc. 89, 693 (1967)

"Photochemical Rearrangement of o-Divinylbenzene"  
M. Pomerantz  
J. Am. Chem. Soc. 89, 694 (1967)

"Photoisomerization of o-Divinylbenzene"  
J. Meinwald, P. H. Mazzocchi  
J. Am. Chem. Soc. 89, 696 (1967)

"The Absolute Configuration of Methyl Allyl Sulfoxide. Stereochemistry of the Grignard Synthesis of Optically Active Sulfoxides"  
P. Beckart, M. Axelrod, J. Jacobus, K. Mislow  
J. Am. Chem. Soc. 89, 697 (1967)

"The Degenerate 9-Homocubyl Cation"  
P. von R. Schleyer, J. J. Harper, G. L. Dunn, V. J. DiPasquo and J. R. E. Hoover  
J. Am. Chem. Soc. 89, 698 (1967)

"Stereochemistry of Macroyclic Complex. Chelate Ring Conformations and Unusual Isomers"  
L. G. Warner, N. J. Rose, D. H. Busch  
J. Am. Chem. Soc. 89, 703 (1967)

"Reaction of Diazomethane with Silyl Ketones"  
A. G. Brook, W. W. Limburg, D. M. MacRae, S. A. Fieldhouse  
J. Am. Chem. Soc. 89, 704 (1967)

""Anomalous" Chemical Shifts in the Nuclear Magnetic Resonance Spectra of the 1,3,5-Trimethylcyclohexanes"  
A. Segre and J. I. Musher  
J. Am. Chem. Soc. 89, 706 (1967)

"On the Stability of the O-T Linkage in 17-Hydroxy-progesterone"  
J. Holtzman, J. R. Gillette, H. M. Fales  
J. Am. Chem. Soc. 89, 708 (1967)

"Correlations of Nuclear Magnetic Resonance and Optical Rotatory Dispersion Spectra for Establishing the Absolute Configurational Assignment of Cobalt(III)-Chelated Optically Active Triethylenetetramine Homolog- $\alpha$ -Amino Acid Adducts"  
R. G. Asperger and C. F. Liu  
J. Am. Chem. Soc. 89, 708 (1967)

"Synthèse et fragmentation de bicyclo (3.1.0) hexanones-2 substituées. I. — Acides ( $\pm$ ) iso cis chrysanthème-dicarboxylique"  
S. Julia et G. Linstrumelle  
Bull. Soc. Chim. France 3490 (1966)

"Synthèse et fragmentation de bicyclo (3.1.0)hexanones-2 substituées. II. — Acides ( $\pm$ ) iso trans chrysanthémique et ( $\pm$ ) trans chrysanthémique"  
S. Julia, M. Julia et G. Linstrumelle  
Bull. Soc. Chim. France 3499 (1966)

"Conformation de dihydropyrimidinediones. III. — Structure demi-chaise du dihydrouracile, de la dihydro-thymine, de leurs dérivés hydroxylés, halogénés ou méthylés et de la méthyl-1 dihydrocytosine"  
P. Rouillier, J. Delmau et C. Nofre  
Bull. Soc. Chim. France 3515 (1966)

"Étude physico-chimique du cycle thiazolique. I. — Étude expérimentale des déplacements chimiques et des couplages en RMN"  
E. J. Vincent, R. Phan-Tan-Luu, J. Metzger et J. M. Surzur  
Bull. Soc. Chim. France 3524 (1966)

"Étude physico-chimique du cycle thiazolique. II. — Étude théorique et structurale"  
E. J. Vincent, R. Phan-Tan-Luu et J. Metzger  
Bull. Soc. Chim. France 3530 (1966)

"Étude physico-chimique du cycle thiazolique. III. — Essai de corrélation entre déplacements chimiques et charges"  
E. J. Vincent, R. Phan-Tan-Luu et J. Metzger  
Bull. Soc. Chim. France 3537 (1966)

"Étude de la réaction de Michael. Configuration et conformation des produits d'addition de la benzyl-phénylcétone sur la phényl-4 butène-3 one-2 trans"  
A.-M. Baradel, J. Dreux et R. Longeray, P. Laszlo, H. Rivière  
Bull. Soc. Chim. France 3543 (1966)

"Les complexes- $\pi$  des métaux de la colonne IV A avec le cyclopentadiène l'indéne et le fluorène"  
E. Samuel  
Bull. Soc. Chim. France 3548 (1966)

"Préparation d'époxydes par réduction condensatrice de dérivés carbonylés"  
J. F. Normant  
Bull. Soc. Chim. France 3601 (1966)

"Hétérocycles oxygénés. VI. — Recherches spectrographiques dans le domaine d'éthers semiaromatiques tricycliques"  
D. Cagniant, C. Charaux et P. Cagniant  
Bull. Soc. Chim. France 3644 (1966)

"Contribution à l'étude des hétérocycles sulfurés condensés. XXXIV. — Clivages d'halogénés, clivages et migrations de radicaux ramifiés sous l'action de catalyseurs acides utilisés pour la cyclisation de composés sulfurés acides ou cétoniques"  
P. Cagniant et D. Cagniant  
Bull. Soc. Chim. France 3674 (1966)

"Analyse Isotopique en Chimie Organique"  
R. Viallard  
Bull. Soc. Chim. France 3695 (1966)

"Étude par résonance magnétique nucléaire de dérivés à cycle dioxaphospholane"  
D. Gagnaire, J.-B. Robert et J. Verrier, R. Wolf  
Bull. Soc. Chim. France 3719 (1966)

"Recherches dans la série des azoles. XIII. — Spectres RMN de pyrazoles"  
J. Elguero, R. Jacquier et H. C. N. Tien Duc  
Bull. Soc. Chim. France 3727 (1966)

"Étude des signes relatifs des couplages en résonance magnétique nucléaire. III. — Couplages <> benzyliques ortho et para"  
D. Gagnaire et Trinh-Huu-Ich.  
Bull. Soc. Chim. France 3763 (1966)

"Préparations et structures d'alcoyl-tétraphenylcyclopentadiènes"  
G. Rio et G. Sanz  
Bull. Soc. Chim. France 3775 (1966)

"Composés soufrés hétérocycliques (I). Action du pentasulfure de phosphore sur quelques esters  $\beta,\beta'$ -dicétioniques"  
C. Trébaul et J. Teste  
Bull. Soc. Chim. France 3790 (1966)

"Sur une préparation d'oxacylanes. III. — Mécanisme de la cyclisation d'éthers méthyliques et halogénés en présence d'acides de Lewis: isolement de sels d'oxonium intermédiaires"  
A. Kirrmann et L. Wartski  
Bull. Soc. Chim. France 3825 (1966)

"Dérivés alleniques du phosphore. Détermination des signes relatifs des couplages phosphore-proton en résonance magnétique nucléaire"  
M. P. Simonnin et B. Borecka  
Bull. Soc. Chim. France 3842 (1966)

"Composés acéténiques du Bore. II.—Bisalkyl, bisdialkylamino et bisalcoxyalcynylbores"  
J. Soulie et P. Cadiot  
Bull. Soc. Chim. France 3846 (1966)

"Orientation stérique de l'époxydation en série stéroïque. II. — Conformation et réactivité de nor-19 stéroïdes et de des-D dinor-18, 19 stéroïdes"  
M. Mousseron-Canet et J.-C. Guilleux  
Bull. Soc. Chim. France 3858 (1966)

"Stéroïdes fluorés. Conformation du  $6\beta$  fluoro  $3\beta$  acétate de Westphalen"  
M. Mousseron-Canet et J.-C. Brial  
Bull. Soc. Chim. France 3867 (1966)

"Photoxydation sensibilisée de quelques composés apparentés à la déhydro  $\beta$  ionone, Synthèse de l'ester méthyle de la ( $\pm$ ) abscisine"  
M. Mousseron-Canet, J.-C. Mani, J.-P. Dalle et J.-L. Olivé  
Bull. Soc. Chim. France 3874 (1966)

"Alcoylation des cétones par l'intermédiaire de l'amylate tertiaire de sodium (16<sup>e</sup> mémoire) Stéréochimie de l'alcoylation des  $t$ -butyl-4 cyclohexanones 1<sup>re</sup> partie"  
J.-M. Conia et P. Briet  
Bull. Soc. Chim. France 3881 (1966)

"Alcoylation des cétones par l'intermédiaire de l'amylate tertiaire de sodium (17<sup>e</sup> mémoire). Stéréochimie de l'alcoylation des  $t$ -butyl-4 cyclohexanones : 2<sup>e</sup> partie"  
J.-M. Conia et P. Briet  
Bull. Soc. Chim. France 3888 (1966)

"Contribution à l'étude de thio-6 xanthines"  
J. Seyden-Penne, L. Thi Minh et P. Chabrier  
Bull. Soc. Chim. France 3934 (1966)

"Condensation d'aldoénamines cyclaniques avec l'acrylate de méthyle et l'acrylonitrile"  
H. Christol, D. Lafont et F. Plénat  
Bull. Soc. Chim. France 3947 (1966)

"Composés organiques sulfurés. XIV. — Réarrangement d'alcools allyliques sulfurés"  
M. Saquet et A. Thullier  
Bull. Soc. Chim. France 3969 (1966)

"Synthèses de tertiotiobutyl-4 D 2 cyclohexylamines"  
G. Lamaty, C. Tapiero et R. Wylde  
Bull. Soc. Chim. France 4010 (1966)

"A Study of cis-trans Isomerism and Conformational Preferences of Thioanilides"  
I. D. Rae  
Can. J. Chem. 45, 1 (1967)