SHORYGIN, P. P. and YEGOROVA, Z. S.

"On Relation of Spectra to Angle of Twist of Methoxy and Dimethylamino Groups with respect to Benzene Ring Plane."

report presented at the 4th International Meeting of Molecular Spectroscopy, Bologna, Italy, 7-12 Sept 1959.

Institute of Physical Chemistry, the University of Moscow.

SHORYGIN, P.P.; ALAUNE, Z.B. [Alaune, Z.]

Optical research of the interference of atomic groups in the
molecules of organic compounds. Liet ak darbai B no.4:57-69 '59.
                                                  (EEAI 9:3)
1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR i
Institut khimii i khimicheskoy tekhnologii AN Litovskoy SSR.
            (Organic compounds) (Molecules)
                    (Atoms)

5(4), 5(3)

AUTHORS: Shorygin, P. P., Alaune, Z. B.   SOV/76-33-3-33/41

TITLE: Investigation of   Solutions of Aromatic Amines in Organic
                Acids (Issledovaniye rastvorov aromaticheskikh aminov v
                organicheskikh kislotakh)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 3, pp 717-721
                (USSR)

ABSTRACT: In the case of aromatic compounds which possess an electronega-
                tive group in the para-position to the amino group, a salt forma-
                tion leads to a noticeable variation of the absorption spectrum.
                Similar variations may be stated by comparing the Raman spectra
                of nitro-benzene solutions with p-nitro-dialkyl aniline. Accord-
                ing to these data the authors of a previous paper (Ref 1) as-
                sumed that in acetic acid solutions aniline (I) forms no salt
                but a compound with the solvent. In this case the authors studied
                the spectra of the solutions of (I) and dimethyl aniline (II)
                as well as the corresponding para-nitro compounds. The absorp-
                tion spectra were obtained by means of the photoelectric spectro-
                photometer SF-4 with a concentration of 10^{-2} - 10^{-4} moles/l of

Card 1/3   the substances under investigation. The Raman spectra were photo-

SOV/76-33-3-33/41

Investigation of   Solutions of Aromatic Amines in Organic Acids

graphed by means of the three-prism spectrograph ISP-51 with the excitation of the Hg line 4358 Å (concentrations of (I) and (II) being about 10%, that of p-nitrodiethyl aniline (III) being $< 1\%$). On the basis of the absorption spectra obtained from (I) in acetic acid (IV), heptane and HCl solutions (Fig 1) it is assumed that a salt was formed by about 95% (I) in 80% acetic acid. Since (I) is acetylated already at room temperature, the Raman spectra of the system (I) + (IV) cannot be clearly interpreted. (II) is not acetylated and it was possible to determine the coefficients of the line intensity of the benzene ring (I_{1600}/I_{1000}) for (II) (Table). The absorption curves of the solutions of (II) (Fig 2) indicate that up to 90% of salt is formed in 100% acetic acid. The above-mentioned spectroscopic data, however, do not exclude the formation of complex compounds. The absorption spectra of (III) show (Fig 3) that no special salt formation occurs in acetic acid, whereas in a benzene solution of trichloro acetic acid 99% of (III) pass into a salt. There are 3 figures, 1 table, and 3 Soviet references.

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SOV/76-33-3-33/41

Investigation of the Solutions of Aromatic Amines in Organic Acids

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physical and
               Chemical Institute imeni L. Ya. Karpov)

SUBMITTED: September 11, 1957

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.5 (4)

AUTHOR: Shorygin, P. P.   SOV/76-33-7-6/40

TITLE: Mutual Influence of Substituents in the Molecules of the
p-Disubstituted Derivatives of Benzene

ABSTRACT: All experiments failed which have hitherto been made for the
purpose of describing chemical and physical properties of the
benzene derivatives by independent constants or increments
(which characterize the substituents, as, for example, data on
absorption spectra (Ref 1)). In order to form an idea of the
properties of aromatic compounds with two substituents, the au-
thor compared here the results of an investigation of three
types of compounds ($X-C_6H_5$, $NO_2-C_6H_4-X$, and $X-C_6H_4-NR_2$) (Table).

He referred to data available in publications on dipole moments
and spectra as well as to data published in the preceding papers
(Refs 3,5) and (Ref 4). The table shows the influence exercised
by the NO_2- and NR_2 group upon the frequency of oscillation of
the individual substituents X. The latter are divided into

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Mutual Influence of Substituents in the Molecules of   SOV/76-33-7-6/40
the p-Disubstituted Derivatives of Benzene

4 groups (in the table), one group with distinctly marked
electronegative properties and another with electropositive
properties. These considerations led to the following conclu-
sions: The difference in the ability of the substituents X to
act as electron donors is greater in the dipole moments of
p-$XC_6H_4NO_2$, smaller in the dipole moments of C_6H_5X, and still
smaller in the dipole moments of p-$XC_6H_4NR_2$. The ability to
act as electron donors of the substituents depends on the kind
of mutual influence of the groups of atoms and cannot be char-
acterized by an independent increment. The introduction of the
individual substituents X results almost in all cases in an
approximation and intensification of the neighboring intense
absorption waves. The influence exercised by the substituents
upon the physical and chemical properties of p-XC_6H_4Y molecules
is stronger if one of the substituents is electronegative and
the other electropositive, and it is considerably weaker if
both substituents are electropositive or electronegative. The
sequence of the substituents in the order of their influence

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Mutual Influence of Substituents in the Molecules of   SOV/76-33-7-6/40
the p-Disubstituted Derivatives of Benzene

upon the individual properties of the molecules offers many
general data, a definite relationship, however, is not to be
expected. Some discussions are given concerning the reasons
for the differences in this sequence. There are 5 figures,
1 table, and 14 references, 4 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii AN SSSR, Moskva (Institute of
Organic Chemistry of the AS USSR, Moscow)

SUBMITTED: September 11, 1957

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5.3610,5.3100   77082
                                              SOV/62-59-12-26/43

AUTHORS: Shorygin, P. P., Shkurina, T. N., Shostakovskiy, M. F.,
                Sidel'kovskaya, F. P., Zelenskaya, M. G.

TITLE: Spectroscopic Investigation of N-Vinyllactams and
                Anilides

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh
                nauk 1959, Nr 12, pp 2208-2212 (USSR)

ABSTRACT: Spectra of N-vinyllactams and anilides were studied, and
                the mutual influence of groups was investigated. Vinyl-
                lactams contain the system $C{=}C{-}N{-}C{=}O$; the examination
                of the interaction of atoms and groups can be simplified,
                to the first approximation, by considering the effect of
                the N-atom on $C{=}C$ and $C{=}O$ bonds, as well as the mutual
                interaction of the double bonds. Raman and UV-spectra
                of vinylpyrrolidone, vinylpiperidone, vinylcaprolactam,
                of various anilides (formanilide, acetanilide, etc.),
                and of simpler molecules containing an N-atom and a
                carbonyl group (pyrrolidone, N-butylpyrrolidone,
Card 1/3   caprolactam, dimethylacetamide were taken. Spectrograph

Spectroscopic Investigation of N-Vinyllactams   77082
and Anilides   SOV/62-59-12-26/43

ISP-51 and PRK mercury lamp were used to obtain Raman
spectra, and spectrograph SF-4 to obtain UV-spectra.
Spectra of vinyllactams in the double bonds region
showed lines characteristic for $C{=}C$ and $C{=}O$ bonds.
It was found that the presence of the N-atom at the
double bond influenced considerably the spectral
characteristics: the frequency of the $C{=}O$ bond was
lowered nearly as much as in molecules containing
$>N{-}C{=}O$ bonds. Values of the extinction . coefficient
of $C{=}O$ bond line in vinylpiperidone and vinylcapro
lactam were quite high, and close to those of vinylamine.
The intensity of $C{=}C$ line of vinylpyrrolidone was
substantially higher, and that of $C{=}O$ line in all
three vinyllactams was many times higher than in com-
pounds with $>N{-}C{=}O$ bonds. This anomaly in the
intensity of the $C{=}O$ bond in Raman spectrum was the
most peculiar characteristic of vinyllactams which
distinguished them from molecules with $C{=}C{-}N{<}$ and
$>N{-}C{=}O$ bonds. It can be explained by the influence
of the $C{=}C$ bond, through the N-atom, on the carbonyl
group (in the bond system $C{=}C{-}N{-}C{=}O$). Similar

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Spectroscopic Investigation of N-Vinyllactams   77082
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relationships were also observed in anilide spectra.
It was noted that the alkylation of N in anilides
weakened the indications of conjugation of N with the
benzene ring, and strengthened those of conjugation
with the carbonyl group. It can be assumed, therefore,
that a $C_6H_5NRCO \cdot X$ molecule loses the coplanarity of the
system C_6H_5-N-C and the system C—N—COX becomes more
planar. There are 3 tables; 1 figure; and 6 references,
1 U.S., 1 U.K., 1 German, 3 Soviet. The U.S. and U.K.
references are R. Bowden, E. Braude, E. Jones, J. Chem.
Soc., 1946, 948; E. Corey, J. Amer. Chem. Soc., 75, 2301
(1953).

ASSOCIATION: N. D. Zelinskiy Institute of Organic Chemistry, Academy
                of Sciences, USSR (Institut organicheskoy khimii imeni
                N. D. Zelinskogo Akademii nauk SSSR)

SUBMITTED: April 7, 1958

Card 3/3

24(7)

AUTHOR: Shorygin, P.P., Professor   S/030/60/000/01/022/067
                                                 B015/B008

TITLE: 4th International Conference on Molecular Spectroscopy

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, Nr 1, pp 68-70 (USSR)

ABSTRACT: The Conference was convened by the International Association
              for Theoretical and Applied Chemistry in Bologna (Italy) in
              September 1959. More than 500 scientists attended, among them
              14 from the Soviet Union. More than 200 reports were received
              which dealt with a wide range of problems of molecular
              spectroscopy. The Soviet scientists gave reports dealing with
              the individual trends developed in Soviet spectroscopic
              laboratories. On the recommendation of the Scientific Faculty
              of Bologna University, the medal G. Ciamiciano was awarded to
              A.N. Terenin, Soviet Scientific Academician, for outstanding
              studies in the field of spectroscopy. An exposition of optical
              instruments was combined with the Conference, among which the
              double beam spectrophotometer of type CF-4 (see figure) and the
              double beam vacuum appliance of type IR-7 (see figure) are
              specially mentioned. The Conference stressed the increasing
Card 1/1   significance of molecular spectroscopy. There are 2 figures.

5.3100

68849

AUTHORS:
Shorygin, P. P., Geyderikh, M. A.,
Ambrush, T. I.
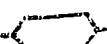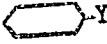
S/076/60/034/02/011/044
B010/B015

TITLE:
The Effect of Substituents on the Properties of Aromatic Nitriles
and Sulfones

PERIODICAL:
Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 2, pp 335-342 (USSR)

ABSTRACT:
The Raman spectra, ultraviolet absorption spectra, and dipole
moments of the para-derivatives of benzonitrile and methylphenyl-
sulfone were examined and compared. The frequency values of the
-C≡N-group valence oscillation of the para-derivatives of the
benzonitrile Raman spectrum, of the coefficients of integral in-
tensity I_{CN} of the CN line in the Raman spectrum, of the intensity
i_{CN} of the CN absorption band in the infrared spectrum, of the
wave lengths of the most important maxima of the intensive ab-
sorption bands in the ultraviolet spectrum (measured with the SF-4
spectrophotometer), and the dipole moments (measured by V. N.
Vasil'yeva and Z. S. Yegorova in benzene and dioxane) are shown by
table I. Table 2 shows the frequency difference of the groups Y
in the molecule X -⬡-Y and ⬡-Y (Y = NO_2, COR, CN, SOOR,OE),
as well as the corresponding wave length difference $\Delta\lambda$ of the

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The Effect of Substituents on the Properties of   S/076/60/034/02/011/044
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absorption bands, and the difference between the measured dipole
moment for X-⟨‾‾‾⟩-Y and the vector sum of the moments for
X-⟨‾‾‾⟩ and ⟨‾‾‾⟩-Y $\Delta\mu$. The effect of substituents exerted on the
investigated properties of the nitro compounds, ketones, nitriles,
and sulfones is of the same character. The order of substituents
(corresponding to the effect on the mentioned properties) is ap-
proximately the same for the four types of compounds mentioned.
In this respect, sulfones do not differ from nitro compounds. The
effect of substituents is, however, strongest with nitro compounds,
and weakest with sulfones (Table 2). The electropositive substi-
tuents reduce the frequency of NO_2, CN, CO, and SO_2, increase,
however, that of OH. The OR group influences the optical proper-
ties of the compounds investigated more strongly than the OH group
whereas the dipole moments and dissociation constants of phenols
and acids are more strongly influenced by the OH group. The as-
sumption put forward in publications that the SO_2 group is in-
capable of forming a conjugation is unfounded. The difference in
the I_{CN} values of some nitriles is in qualitative agreement with
the difference in the i_{CN} values. V. A. Petukhov took some of the

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The Effect of Substituents on the Properties of   S/076/60/034/02/011/044
Aromatic Nitriles and Sulfones   B010/B015

> absorption spectra. There are 2 figures, 3 tables, and 9 re-
> ferences, 2 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii AN SSSR (Institute of Organic
Chemistry of the AS USSR)

SUBMITTED: April 26, 1958

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Shorygin, P.P.

S/020/60/133/02/23/068
B019/B060

AUTHORS: Shorygin, P. P., Krushinskiy, L. L.

TITLE: On the Theory of Combination Scattering of Light?[1]

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2,
            pp. 337-340

TEXT: By way of introduction, the authors derive the classical formula
(1) and the quantum-theoretical formula (3) for the calculation of the
spectral lines of combination scattering. The applicability of these
formulas is discussed, and formula (1) is graphically illustrated in
Fig. 1. This diagram holds for the classical model of a diatomic molecule
with excited states of short lifetime. Similar results are obtained for
the quantum-theoretical model, as follows from the analogous diagram in
Fig. 2. From the discussion of the formulas derived here and from the
diagrams shown the authors conclude that with a decrease in the
attenuation of the higher harmonic an approach occurs to that intensity
distribution which is observed with resonance fluorescence. Some
experimental data are discussed, and it is shown that the intensity of

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On the Theory of Combination Scattering
of Light

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B019/B060

the lines does not, as often stated, change proportionally with absorption. The observation of a resonance Raman spectrum is said to be restricted by the large absorption losses of light (up to 99% and more). However, the authors note from formulas (1) and (3) that in the region of the strongest absorption bands the conditions for the observation of a resonance scattering are considerably more favorable than in the region of weaker bands. There are 3 figures and 2 Soviet references.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

PRESENTED: March 3, 1960, by I. V. Obreimov, Academician

SUBMITTED: February 29, 1960

Card 2/2

5.3400

AUTHORS: Shorygin, P. P., Shkurina, T. N., Shostakovskiy, M. F., and
             Gracheva, Ye. P.

TITLE: Spectra and structure of vinyl ethers

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh
             nauk, no. 6, 1961, 1011 - 1015

TEXT: A study has been made of the influence of various functional groups
on the properties of vinyl compounds and on the state of the double bond
$C=C$. In the case of vinyl ethers, the influence exerted by the alkoxy
group upon the double bond becomes evident in chemical properties, such as
increased reactivity in addition reactions, in hydrolysis, and in polymeri-
zation and copolymerization processes. Not much material is available in
the literature with regard to the influence of the alkoxy group upon the
strength of the double bond $C=C$ and upon the optical properties. The
present paper deals with studies concerning the Raman spectra and the
ultraviolet absorption spectra in vacuo for a series of vinyl ethers
containing alkyl, naphthene and aromatic radicals. Most vinyl ethers

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Spectra and structure of...

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S/062/61/000/006/001/010
B118/B220

have several lines in the frequency range of the stretching vibrations
C=C. The splitting depends on the branchings of the alkyl group and on the
presence of an α-substituent. The influence of temperature upon the inten-
sity of the lines $\sim$1610 and $\sim$1640 cm^{-1} of vinyl butyl ether indicates their
relation to the two rotational isomers. The influence of the group OAlk
on $\omega_{C=C}$ may be regarded qualitatively as a tendency to reduce the frequen-
cy. The wavelength of the first absorption band and the intensity of the
C=C line in the Raman spectra are greater for vinyl ethers than for
alkenes of similar structure. The influence of solutions and temperature
on the structure of the C=C band was studied. Thus, the geometric con-
figuration of the molecules of vinyl ethers may be important to both the
physical and chemical properties. The Raman spectra were taken with the
ИСП-67 (ISP-67) spectrograph with the Hg line 4358Å. The absorption
spectra were taken with spectrophotometers of types СФ-4 (SF-4) and СП-41
(SP-41) with the assistance of V. A. Petukhov. There are 2 figures,
1 table, and 3 references: 1 Soviet-bloc and 2 non-Soviet-bloc. The
1 reference to English-language publication reads as follows: Y. Mikawa,
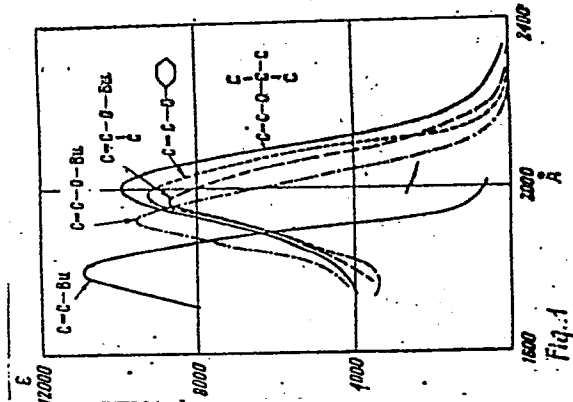Bull. Chem. Soc. Japan 29, 110 (1956).

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Spectra and structure of...

25039
S/062/61/000/006/001/010
B118/B220

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii
nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy of the
Academy of Sciences USSR)

SUBMITTED: June 1, 1959

Fig. 1: Ultraviolet absorption
spectra of octene-1 and vinyl
ethers (solutions in heptane).
Legend: bu-butyl group;
- ‾‾‾ >-cyclohexyl group.

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SHORYGIN, P.P.; SHOSTAKOVSKIY, M.F.; PRILEZHAYEVA, Ye.N.; SHKURINA, T.N.; STOLYAROVA, L.G.; GENICH, A.P.

Structure and spectra of vinyl sulfides. Izv. AN SSSR. Otd.khim.nauk
no.9:1571-1577 S '61.   (MIRA 14:9)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
                        (Vinyl sulfide--Spectra)

KRUSHINSKIY, L.L.; SHORYGIN, P.P.

Theory of line intensities in light scattering spectra. Part 1. Quantum model (Condon approximation). Opt.i spektr. 11 no.1:24-34 Jl '61.

(MIRA 14:10)

(Raman effect)   (Quantum theory)

KRUSHINSKIY, L.L.; SHORYGIN, P.P.

Theory of the line intensities in Raman spectra. Part 2.
Quantum model (Taking anharmonicity and deviations from the
Condon approximation into account). Opt. i spektr. 11
no.2:151-160 Ag '61.   (MIRA 14:8)
                    (Raman effect)
                    (Quantum theory)

S/076/61/035/002/002/015
B124/B202

AUTHORS: Shorygin, P. P., Roshchupkin, V. P., Petukhov, V. A., and Yegorova, Z. S.

TITLE: Effect of substituents on the properties of molecules containing a system of conjugate π bonds

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 2, 1961, 258-268

TEXT: The authors study the group of para-derivatives of nitrobenzene $X - \langle \rangle - NO_2$ with different substituents X. To characterize the compounds the following values are given in Table 1: 1) difference ($\Delta \omega_s$, in cm^{-1}) between the values of symmetrical stretching vibrations of the nitro group of the compound $X - \langle \rangle - NO_2$ and those of non-substituted nitrobenzene on the basis of the Raman spectra of benzolic solutions; the accuracy is $\pm 0.5 - 1 cm^{-1}$ (the values with asterisks are obtained from the infrared spectra). In the case of doublets the mean value of the frequency which has the symbol $\sim$ is given. The frequency

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Effect of substituents on the properties...   S/076/61/035/002/002/015
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ω_s of the nonsubstituted nitrobenzene in benzene is 1347.5 cm^{-1}; 2) the difference ($\Delta\omega_{as}$ in cm^{-1}) between the values of the frequency of the antisymmetric stretching vibration of the nitro group of compound

X -⬡- NO_2 and of those of nitrobenzene on the basis of the infrared absorption spectra of the benzolic solutions; accuracy ± 2 cm^{-1}. The frequency ω_{as} of nitrobenzene is 1533 cm^{-1}; 3) the coefficient of the total intensity (I_s) of the Raman bands with the frequency ω_s; 4) characteristics of the intense absorption bands in the UV range for solutions in heptane; the wavelengths are given in parentheses in A; at the values $\epsilon/1000$, ϵ denotes the (decimal) molar absorption coefficient in the maximum of the bands; 5) difference (λ_1, in A) between the λ_1-values

of the compounds X -⬡- NO_2 and those of nitrobenzene from the values measured in benzene; 6) difference ($\Delta\mu$) between the dipole moment μ of

compound X -⬡- NO_2 and the sums of the vectors of the moments

X -⬡ and ⬡- NO_2 (in debyes) which also characterize the interaction

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Effect of substituents on the properties...

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of the groups concerned, and 7) Hammett constants σ_{para} characterizing the effect of the substituents X on the reactivity of the groups Y in the molecules X - ◯- Y. The electropositive and electronegative substituents influence the oscillation frequency of the nitro group as well as the deviations of the dipole moments from the additivity and the reactivity mainly in opposite direction, whereas they influence the optical properties (intensity of Raman bands of the NO_2 group, polarizability, position and intensity of the absorption bands) in the same direction. In all cases, the effect of the electropositive substituents in the molecules X -◯- NO_2 is considerably stronger than that of the electro- negative substituents, whereas the opposite holds for the molecules. Ramified and not ramified alkyl groups influence the physical properties of the nitro compounds in the same way. The effect of methylation on the influence of the substituents increases in the following order: $CH_3 < OH < SH < NH_2$. The effect of the substituents C_6H_5 and $CH_2:CH_2$ on the dipole moments, frequency of the nitro groups, and the chemical properties is relatively low, on the optical properties, however, it is strong. This holds for substituents of the type $CH:CH \cdot Z$, $\cdot C_6H_4 \cdot Z$ and $\cdot N:N \cdot Z$. The

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interaction of two atom groups on their chemical bonds is reduced with increasing length of the chain of the π bonds which separate these groups from one another. The effect of the substituents on the optical properties is the stronger the longer the chain of the conjugate bonds. Heavy atoms which are connected with the system of π bonds over a CH_2 bridge considerably influence the system concerned, i.e., mainly the parameters of the electron excitation levels. T. I. Ambrush, M. A. Geyderikh, Ye. A. Smirnov, A. V. Dombrovskiy, E. I. Budovskiy, G. S. Ter-Sarkisyan, U. I. Khurgin, A. Kh. Khomenko, A. N. Nesmeyanov, R. V. Golovnya, B. V. Lopatin, V. N. Vasil'yeva, and V. G. Vasil'yev are mentioned. There are 6 figures, 1 table, and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. 1 reference to English language publications reads as follows: C. Curran, F. Palermiti, J. Amer. Chem. Soc. 73, 3733, 1951.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov); Institut organicheskoy khimii AN SSSR (Institute of Organic Chemistry AS USSR)

SUBMITTED: April 11, 1957

Card 4/9

Effect of substituents on the properties...

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Валентные колебания нитро-группы

Группа X в O_2N-	$\Delta\omega_s$	$\Delta\omega_{as}$	I_s	$\lambda_i \left(\dfrac{\varepsilon_i}{1000}\right)$	f_i
$-O-$	-5	-9	4000	2930 (15)	0,37
$\cdot$Ph	$-1,5$	-8	5500	2940 (18)	0,45
$\cdot$NHCOR	-1	-18	—	3000 (15,4)	0,44
$\cdot$NRCHO	-10	—	6000	3040 (12)	0,35
$\cdot$SH	$-7,5$	-12	6000	3050 (12,7)	0,32
$\cdot$SR	-8	-5	17000	3260 (15)	0,30
	-4		18000	3530 (9)	0,18
$\cdot C:N-$		-10	—	2900 (10,5)	0,35
				3900 (4)	0,06
$-$ ферроцен	-8	-16	20000	3120 (16,5)	0,37
$\cdot$NH$_2$	-12	0	—	3200 (16)	0,37
$\cdot N:N-$	-3	-9	22000	3250 (24)	0,64
$\cdot C:C\cdot C:C$	$-6,5$			3300 (22)	0,60
				3130 (21)	
$\cdot C:C$	-6	-10	22000	3300 (18,7)	0,52
$\cdot$NH$\cdot$NH$\cdot$Ph	-16	-18	38000	3300 (15,7)	0,47
$\cdot$NH$\cdot$NH$_2$	-19	-15	45000	3350 (19)	0,47
$\cdot C:C\diagdown$Ph	-6	-10	66000	3450 (20)	0,50
$\cdot$NHR	-21	-20	75000	3400 (18)	0,39
$\cdot$NHPh	-26	-27	—	3530 (21)	0,42
$\cdot$NR$_2$	-28		240000	3540 (20)	0,41
$\cdot$NEt$_2$	-29	-24	400000	3620 (22)	0,40
$\cdot C:C-C:O$	-6	—	200000	3740 (35)	0,8
$N\cdot O$					0
$\cdot(C:C)_2$Ph	-8	-10	—	3940 (50)	1,2
$\cdot C:C-$NH$_2$	-0	—	—	3830 (26)	0,6
$\cdot C:C=$NR$_2$	-8	—	$5\cdot10^4$	4130 (28)	0,62
$\cdot C:N-$NR$_2$	-5	—	—	4350 (22)	0,5
$\cdot N:N-$NR$_2$	-9	-5	—	4430 (32)	0,67

Effect of substituents on the properties...

S/076/61/035/002/002/015
B124/B202

Card 6/9

① УФ спектры поглощения

λi $\left(\frac{\varepsilon_i}{1000}\right)$	λвi $\left(\frac{\varepsilon_i}{1000}\right)$	Δλ	Δμ	σпара ⑦
2180 (12)	1830 (12)	420	0,6	-0,3
2220 (12)		440	0,3	0
2240 (12)		520		0
2240 (9)		540		0,1
2240 (8)		560	0,6	-0,05
2200 (8)		780		
2550 (13)				
2800 (11)				-0,65
2260 (8,5)	1940 (19)	820	1,0	
2140 (13)		740	0,4	
2340 (14)		760		
2380 (12)	1985 (34)	720	0,5	-0,65
2280 (12)		890		
2250 (11)		870		
2400 (17)		930		
2220 (8)	1960 (21)	1050	1,2	-0,7
2350 (8)		1130	0,8	-0,65
2280 (8)		1180	1,4	-0,7
2320 (8)		1280		
2070 (11)		1200		
3000 (19)	2450 (15)	1430		
2750 (11)		1380		
2890 (12)	1960 (31)	1680		
2690 (24)		18?0		
2780 (12)		2050		

S/076/61/035/002/002/015
B124/B202

Effect of substituents on the properties...

Card 7/9

① Валентные колебания нитрогруппы
④ Группа X в-

Группа X	$\lambda_i \left(\frac{\alpha_i}{1000}\right)$	I_s	$\Delta\omega_{as}$	$\Delta\omega_s$	f_i
.H	2520 (9,6)	700	0	0	0,27
.SO₂R, .CONH₂	2470 (11,5)	800	8	3	0,34
.F	2520 (12,5)	—	—	—	—
.COOEt	2580 (8,5)	900	-2	0	0,23
.CHO	2540 (14)	1000	2	-2	0,36
.CH₂Cl	2580 (17)	1000	4	-1	0,41
	2580 (12)	1100			0,31
.CCl₃	2550 (14,5)	—	—	-1	—
.OCOR	2640 (10,2)	1200	-1	-1	0,29
.Cl	2670 (11)	1400	3		0,29
	[2600 (15)]	—	—	—	—
.CH₂–NH–R (ring)	2650 (10,2)	1450	-9	-4	0,28
.CR, .CH₂NR₃	2650 (10,5)	1500	-8	-2	0,29
.Br	2620 (10,5)	1550	-8	-2	0,30
	2700 (12)	1600	-2	-3	0,30
.CO–NR (ring) .OR	[3000 (5)]	2000	-9	-1	—
.J	2880 (12,5)	2700	-2	0	0,32
.CH₂J	2660 (12,5)	2800	-5	-3	0,40
.OH	2850 (10,5)	3200	-10	-5	0,26
.C:C	2900 (18)	3500	-16	-2,5	0,4
.OR	2920 (12)	4000	-16	-5	0,29
.OEt	2950 (12,3)	4200	-18	-6	0,30

Effect of substituents on the properties...

Card 8/9

УФ спектры поглощения

σ_{para}	$\Delta\mu$	$\Delta\lambda$	$\lambda_i\left(\dfrac{\varepsilon}{1000}\right)$	$\lambda_i\left(\dfrac{\varepsilon}{1000}\right)$
0	0	0	1960 (20), 1745 (30)	[2100 (10)]
0,6	—	-1	—	—
0,3	—	0	—	—
0,05	-0,1	-80	—	1870 (28)
0,5	—	-50	—	1925 (23)
0,4	-0,1	-80	—	[2150 (10)]
0,2	—	-80	2000 (16), 1820 (25)	—
0,4	—	-50	—	2160 (11)
0,1	0,15	120	2000 (14), 1810 (24)	2450 (18)
0,2	—	130	—	2130 (8,5)
—	—	—	—	—
-0,15	0,1	130	2000 (13), 1770 (26)	2130 (8)
-0,2	-0,15	130	—	—
0,25	—	120	—	—
—	0,4	170	—	2410 (15,3)
0,3	0,2	340	1940 (32), 1750 (24)	[2200 (10)]
—	0,7	160	—	2190 (9)
-0,35	0,35	390	1880 (21)	2200 (9)
0	0,45	400	—	2200 (9)
-0,25	—	460, 480	—	—

Effect of substituents on the properties.....

$S/076/61/035/002/002/015$
$B124/B202$

Legend to Table 1:   1) group X in, 2) stretching vibrations in the nitro group, 3) UV absorption spectra..., 4) σ_{para}, 5) ferrocene.

The methyl group is designated with R in the formulas, the H-atoms at the carbon are omitted in most of the formulas; the hexagon or Ph denote the benzene ring. λ, ε and f (oscillator output) are given for solutions in heptane and $\Delta\lambda_1$ for solutions in benzene; λ_1 of the non-substituted nitrobenzene in benzene is 2620 A approximately; + are the absorption bands with fine structure; the tables give the values λ and ε of the most intense component.   The position of the inflection point of the absorption curve is given in brackets.

Card 9/9

89729

24.4500

AUTHORS: Krushinskiy, L. L. and Shorygin, P. P.

TITLE: Consideration of the Oscillating Structure of the Electron
                Excitation Levels of Molecules in the Quantum Theory of
                Light Scatter

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3,
                pp. 577-580

TEXT: An important part of the quantum theory of light scatter by
molecules is taken up by the analysis of the contribution of oscillation
sublevels in the polarizability matrix elements determining the line
intensities in the spectrum. If as contribution of the v-th sublevel of
the electron excitation level of the investigation to the polarizability
matrix element a^{mn} (corresponding to the vibrational transition $m \longrightarrow n$)
the quantity

$$A_v^{mn} = F(\nu, v) \langle v|M_{oe}(r)|m\rangle \langle v|M_{oe}(r)|n\rangle \qquad (1) \quad \text{is considered, where}$$

Card 1/5

89729

Consideration of the Oscillating Structure   S/020/61/136/003/012/027
of the Electron Excitation Levels of Molecules   B019/B056
in the Quantum Theory of Light Scatter

$$F(\nu,v) = \frac{2\nu_{ev} - \nu_k + 2i\gamma_{ev}}{\nu_{ev}^2 - \nu^2 - \gamma_{ev} + 2i\gamma_{ev}\nu_{ev} - \nu_k(\nu_{ev} - \nu + i\gamma_{ev})}$$

is a frequency factor, ν_{ev} - the frequency of transition to the v-th
sublevel of the excited state from the m-th sublevel of the ground state,
γ_{ev} - the width of the v-th sublevel, ν_k the frequency change of a
photon in scattering, γ - the frequency of the exciting light, $M_{oe}(r)$ -
the momentum matrix element, developed from the electron wave function,
and r the internuclear distance. Thus, the polarizability matrix element

may be given with $a^{mn} = \frac{1}{hc}\sum_v A_v^{mn}$ (2). The relation (2) may be obtained
from the Kramers-Heisenberg formula, if the complete wave function of a
bi-atomic molecule is investigated in adiabatic approximation. The
authors confine themselves for simplicity's sake to an excitation level

Card 2/5

89729

Consideration of the Oscillating Structure   S/020/61/136/003/012/027
of the Electron Excitation Levels of Molecules   B019/B056
in the Quantum Theory of Light Scatter

and investigate only the diagonal elements of the polarizability tensor.
In first approximation

$M_{oe}(r) = M^o_{oe}(1 + \eta r)$ (6) is obtained, and thus from formula (1) the

expression $A^{mn}_v = F(\nu,v)(M^o_{oe})^2 \left\{ (v,m) + \eta(v,rm) \right\} \left\{ (v,n) + \eta(v,rn) \right\}$ (7)

is derived, where $(v,rm) = \langle v|r|m \rangle$. For the contributions of the

sublevels in the equation $A^{mn}_v = F(\nu,v)M^2_{oe}B^{mn}_v$ the following expressions
are obtained by Condon approximation:

$$B^{oo}_v = \frac{1}{v!}\left(\frac{\alpha \Delta^2}{2}\right)^v \exp\left(- \frac{\alpha \Delta^2}{2}\right) \left\{ (1 + \eta \bar{r}_0) - \frac{\eta}{\alpha \Delta} v \right\}^2$$

$$B^{o1}_v = \frac{1}{v!}\left(\frac{\alpha \Delta^2}{2}\right)^{v-1/2} \exp\left(- \frac{\alpha \Delta^2}{2}\right)\left(\frac{\alpha \Delta^2}{2} - v\right) \cdot \left\{ (1+\eta \bar{r}_0)(1+\eta \bar{r}_0 + \frac{\eta}{\alpha \Delta}) \right\}$$

Card 3/5

89729

Consideration of the Oscillating Structure
of the Electron Excitation Levels of Molecules
in the Quantum Theory of Light Scatter

S/020/61/136/003/012/027
B019/B056

$$- \frac{\eta}{\alpha \Delta} (2 + 2\eta \bar{r}_0 + \frac{\eta}{\alpha \Delta}) v + \frac{\eta^2}{\alpha^2 \Delta^2} v^2 \Big\}$$

$$B_v^{o2} = \frac{\sqrt{2}}{2} \frac{1}{v!} (\frac{\alpha \Delta^2}{2})^{v-1} \Big\{ (\frac{\alpha \Delta^2}{2})^2 - 2v \frac{\alpha \Delta^2}{2} + v(v-1) \Big\} \exp(- \frac{\alpha \Delta^2}{2})$$

$$\times \Big\{ (1 + \eta \bar{r}_0)(1 + \eta \bar{r}_0 + \frac{\eta}{\alpha \Delta}) - \frac{2\eta}{\alpha \Delta}(1 - \eta \bar{r}_0 + \frac{\eta}{\alpha \Delta})v + \frac{\eta^2}{\alpha^2 \Delta^2} v^2 \Big\} .$$

It is further stated that the representation of $M_{oe}(r)$ with (6) is
permitted only in a small interval r which, however, is sufficiently large
for calculating (v,rm). If the function $M_{oe}(r)$ within this range does not
change its sign, the Condon approximation represents the contribution of
the sublevels. In the opposite case, these contributions of the sublevels
change more or less considerably and a bifurcation of the absorption band
may occur. Thus, for instance, at $v = E \Big\{ (\alpha \Delta / \eta)(1 + \eta r''_0) \Big\}$ the expression

Card 4/5

89729

Consideration of the Oscillating Structure   S/020/61/136/003/012/027
of the Electron Excitation Levels of Molecules   B019/B056
in the Quantum Theory of Light Scatter

for $B_v^{oo} \cong 0$. These relations are finally discussed in detail. There are

1 figure and 6 references: 3 Soviet and 2 German.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Institute
                of Physics and Chemistry imeni L. Ya. Karpov)

PRESENTED: July 21, 1960, by A. N. Terenin, Academician

SUBMITTED: July 12, 1960

Card 5/5

SHORYGIN, P.P.; POPOV, Ye.M.

Unusual manifestations of the mutual influence of atomic groups in
spectra of complex molecules. Dokl. AN SSSR 146 no.5:1132-1135
O '62.   (MIRA 15:10)
            (Chemical bonds) (Organic compounds—Spectra)

SHORYGIN, P.P.; KRUSHINSKIY, L.L.

"LICHTSTREUNG, FLUORESZENZ UND ERSCHEINUNGEN DES ZWISCHENTYPS."

Report presented at the Spectrascopicum, 11th Intl. Colloquium,
Belgrade, Yug, 30 Sep - 4 Oct 63.

.......Y, L. L.; SHORYGIN, P. P.

"Sur la Correspondance des Resultats de la Theorie de L'Effect Raman Classique et Quantique."

report submitted to 11th Intl Spectroscopy Colloq, Belgrade, 30 Sep-4 Oct 63.

Inst Organic Chemistry, AS USSR, Moscow.

SHORYGIN, P.P.; IVANOVA, T.M.

Raman effect and the lifetime of an excited state. Opt. i spekt. 15
no.2:176-181 Ag '63.   (MIRA 17:1)

PETUKHOV, V.A.; MIRONOV, V.F.; SHORYGIN, P.P.

    Ultraviolet spectra and structure of unsaturated compounds of
the elements of group IV. Izv. AN SSSR Ser. khim. no.12:2203-2206
D '64
                             (MIRA 18:1)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN SSSR.

KRUSHINSKIY, L.L.; SHORYGIN, P.P.

Theory of line intensities in Raman spectra. Part 5. Opt. i spektr.
16 no.1:30-39 Ja '64.   (MIRA 17:3)

KRUSHINSKIY, L.L.; SHORYGIN, P.P.

Some aspects of the classical theory of the resonance transfor-
mation of light by molecules. Izv.AN SSSR.Ser.fiz. 27 no.4:
497-502 Ap '63.   (MIRA 16:4)
        (Oscillators, Electric) .. (Nuclear optical models)

L 10833-63   EWP(j)/EWT(1)/EWT(m)/BDS--AFFTC/ASD--Pc-4--RM
ACCESSION NR: AP3000747   S/0020/63/150/003/0533/0536   60
                                                                                59

AUTHOR: Shorygin, P. P.: Ivanova, T. M.

TITLE: Molecular light scattering and lifetime of excited states

SOURCE: AN SSSR. Doklady, v. 150, no. 3, 1963, 533-536

TOPIC TAGS: Raman effect, lifetime of excited states, band spectra, diphenyl-
polyenes, fluorescence of organic molecules

ABSTRACT: The purpose of this study was the elucidation of the interaction between
light and molecules. The Raman spectra of compounds with a large lifetime of
electron-vibrational energy levels can give the intensity of the fundamental fre-
quency and of overtones, the widths of the lines, and the degree to which the
normal vibrations are the same in the absorption-, scattering-, and fluorescent
spectra. The resonance Raman spectra of the diphenylpolyenes Ph-(CH=CH) sub n -Ph
were studied in this work, particularly those of diphenyldecapentaene Ph-(CH=CH)
sub 5 - Ph and diphenyldodecahexaene Ph-(CH=CH) sub 6 -Ph in an acetone solution
which were excited with Hg-lines of wave numbers of 24,705 and 22,938 cm sup -1.
The experimental curves for the absorption coefficient vs. the wave number as well
as the Raman and fluorescence spectra for these two compounds are given. The

Card   1/2

L 10833-63
ACCESSION NR: AP3000747

spectra were obtained at 25C; the absorption spectra at -70C and the secondary
spectra at -196C are also given. At a lower temperature, the intensity of these
Raman spectra changes much more than in the non-resonance spectra. This is attri-
buted to the increase of the lifetime of the corresponding levels and to the shift
of the absorption bands. Other peculiarities of the secondary spectra are also
described. Orig. art. has: one figure and two tables.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii Nauk SSSR
(Institute of Organic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 24Dec62   DATE ACQD: 21Jun63   ENCL: 00

SUB CODE: 00   NO REF SOV: 004   OTHER: 003

ch/CD
Card 2/2

L 49777-65   EWT(1)

ACCESSION NR: AR5012238

UR/0058/65/000/003/D015/D015

SOURCE: Ref. zh. Fizika, Abs. 3D104

AUTHORS: Kruchinskiy, L. L.; Shorygin, P. P.

TITLE: Concerning the correspondence between the results of quantum and classical theory of the intensity of Raman lines

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 162-169

TOPIC TAGS: optical center, quantum theory, classical theory, correspondence principle, Raman scattering, Raman line

TRANSLATION: Different optical center models used in the theory of Raman scattering are compared. The quantum model considered is a system with two electon-energy levels possessing a vibrational structure (the molecular wave functions are chosen in the Born-Oppenheimer approximation). The classical models used are linear operators: a) with periodically varying parameters; b) with adiabatically slowly varying parameters. The regions of correspondence between the quantum and classical

Card 1/2

L 49777-65
ACCESSION NR: AR5012238 O

results of the calculation of the intensities of Raman lines of first and second
orders are established.

SUB CODE: OP, GP   ENCL: 00

BJB

Card 2/2

L 12906-65   EWT(1)/EEC(b)-2   IJP(c)/AFWL/ASD(m)-3/SSD/ESD(gs)/ESD(t)

S/0051/64/017/004/0551/0557

ACCESSION NR: AP4047176

AUTHORS: Shory*gin, P. P.; Krushinskiy, L. L.   β

TITLE: Interrelation between light scattering and fluorescence, and transition phenomena

SOURCE: Optika i spektroskopiya, v. 17, no. 4, 1964, 551-557

TOPIC TAGS: light scattering, fluorescence, resonance spectrum, molecular spectrum, resonance scattering, nonresonant scattering

ABSTRACT: It is shown that the energy distribution in the spectrum of secondary radiation of light from molecules can be described both on the basis of quantum and on the basis of the classical model of a light-scattering molecule. The simple classical model is more suitable for the excitation of Raman spectra away from resonance, where it can explain adequately the connection between the intensity of the Raman lines and the main parameters of the electronic absorp-

Card   1/3

L 12906-65
ACCESSION NR: AP4047176   O

tion spectra. It is also suitable under resonance conditions, pro-
vided the oscillator attenuation constant (γ) is much larger than
the frequency ω of the nuclear oscillations. When $\gamma \gg \omega > \Gamma$ (the
half-width of the radiation incident on the molecule) resonance
scattering differs from the nonresonance scattering principally in
having a larger line intensity. When $\omega > \gamma > \Gamma$, it becomes necessary
to use the quantum approach. The line intensity distribution comes
closer to that of resonance fluorescence, but the line contours re-
tain the specific features of scattering. When $\omega > \gamma \simeq \Gamma$ the line
contours lose all similarity to the contour of the incident-light
line, and when $\Gamma > \gamma$ the radiation acquires all the features of
resonance fluorescence. When the quantum approach is used, such a
classical concept as the polarizability must be replaced by a con-
cept of a transfer function for the quantum oscillator. Orig. art.
has: 5 formulas and 2 figures.

ASSOCIATION: None

Card   2/3

L 12906-65
ACCESSION NR: AP4047176

SUBMITTED: 01Aug63   ENCL: 00

SUB CODE: OP, NP   NR REF SOV: 007   OTHER: 000

Card   3/3

SIROTIN, I.I.; POPOV, Ye.M.

Characteristics of the mechanical properties of chemical bonds
in polyatomic molecules. Zhur. fiz. khim. 38 no.6:1429-1433
Je '64.   (MIRA 18:3)

1. Institut organicheskoy khimii AN SSSR.

ACCESSION NR: AP4013327   S/0020/64/154/003/0571/0574

AUTHORS: Shory*gin, P.P.; Krushinskiy, L.L.

TITLE: Light scattering, florescence, and transient phenomena

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 571-574

TOPIC TAGS: Light scattering, fluorescence, Roman scattering, quantum theory, intermediate optical phenomena

ABSTRACT: The authors point out that the secondary emission can be described either in terms of quantum or classical theory, and in many cases it is advantageous to use a combination of elements of both theories. The applicability of the conceptions depends upon the relationship between the electron oscillator damping γ, the frequency of molecular vibrations ω, and the vibration damping Γ. Outside the resonance, the Roman scattering is well described by the classical model in which the molecular polarizability is a linear function of the nuclear coordinates. It is still applicable under resonance conditions if $\gamma \succ \omega \succ \Gamma$. When $\omega \succ \succ \gamma \succ \Gamma$, the distinction between the free and the forced oscillations becomes

Card 1/2

ACCESSION NR: AP4013327

questionable. Under these conditions, the polarizability conception
is no more useful. Instead, a more general "transitional function"
can be introduced which is used in radio electronics and in theory
of oscillations. This function describes the general features of
the spectra. Orig. art. has: 2 figures.

ASSOCIATION: Institut organicheskoy khimii Akademii Nauk SSSR
(Institute for Organic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 10Jul63   DATE ACQ: 26Feb64   ENCL: 00

SUB CODE: PH   NO REF SOV: (006   OTHER: 000

Card 2/2

SHORYGIN, P.P.; ROSHCHUPKIN, V.P.; KHOMENKO, A.Kh.

Regularities in the mutual influence of atomic groups adjoinging
the methylene bridge. Dokl. AN SSSR 159 no.2:391-394 N '64.
(MIRA 17:12)

POPOV, Ye.M.; KHOMENKO, A.Kh.; SHORYGIN, P.P.

Splitting of the vibration frequencies of multiple bonds of
symmetrical molecules. Izv. AN SSSR Ser. khim. no.1:51-58
'65.   (MIRA 18:2)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.

L 34880-65   EWT(1)/EWT(m)/EPF(c)/EWP(j)/EEC(t)   Pc-4/Pr-4/Peb   IJP(c)   RM
ACCESSION NR: AP5005034   S/0051/65/018/002/0206/0211

AUTHOR: Ivanova, T. M.; Yanovskaya, L. A.; Shorygin, P. P.

TITLE: Spectra of resonant Raman scattering of polyene compounds having structural absorption bands

SOURCE: Optika i spektroskopiya, v. 18, no. 2, 1965, 206-211

TOPIC TAGS: Raman scattering, Raman spectrum, polyene compounds, diethyl ether, absorption band

ABSTRACT: This is a continuation of earlier work by two of the authors (Shorygin and Ivanova) on resonant Raman spectra of substances with large lifetimes of effective electron-vibrational levels. In the present article the authors report an investigation of Raman spectra of the vinylogous series of diethyl ethers of polyene a,ω-dicarboxylic acids $C_2H_5OOC(CH=CH)_nCOOC_2H_5$, n = 1--8, whose absorption bands have a pronounced vibrational structure. As n increases and the exciting frequency approaches the absorption band, the lines that become particularly strong in intensity in the Raman spectra are those with frequencies ~ 1140 and ~ 1550 cm^{-1}

Card 1/2

L 34880-65
ACCESSION NR: AP5005034   0

Near resonance, progressions of the ~ 1140 and ~1550 cm^{-1} vibrations and their different combinations appear in the scattering spectra, and under certain conditions of excitation, the intensity of the overtones exceeds the intensity of the fundamentals; in this respect, the scattering spectrum becomes similar to that of resonance fluorescence. It is shown that the frequency dependence of the line intensities of the resonant Raman spectrum in the region of the structural absorption band is characterized by several maxima. Orig. art. has 1 figure and 4 tables.

ASSOCIATION: None

SUBMITTED: 28Nov63   ENCL: 00   SUB CODE: OP, OC

NR REF SOV: 006   OTHER: 004

Card 2/2

L 5424-66   EWT(1)/T   IJP(c)

ACCESSION NR: AP5019766   UR/0051/65/019/002/0289/0291
                                                   535.338.001.1
AUTHOR: Morozov, V. A.; Shorygin, P. P.

TITLE: Contribution to the theory of radiative width of spectral lines

SOURCE: Optika i spektroskopiya, v. 19, no. 2, 1965, 289-291

TOPIC TAGS: spectral line, line width, photon, spectral energy distribution, light emission

ABSTRACT: This is a continuation of earlier work [Abstracter's note: the reference to the earlier paper has been omitted from the source as a result of a printer's error], where a system of equations for the U matrix was derived with account of exchange of virtual photons between overlapping intermediate levels. The present paper considers the influence of this phenomenon on the change in the spontaneous-emission line shape. The spontaneous-emission line contours are calculated for a molecule with two close excited levels remote from the ground level, first neglecting and then taking into account an exchange of photons between the excited levels. Allowance for the exchange is shown to produce a noticeable shift in the line peak and a strong distortion of its symmetry. Orig. art. has: 3 figures and 15 formulas.

Card 1/2

L 5424-66

ACCESSION NR: AP5019766   *O*

ASSOCIATION: none

SUBMITTED: 30Nov64   ENCL: 00   SUB CODE: OP

NR REF SOV: 000   OTHER: 001

Card 2/2

L 2127-66   EWT(1)

ACCESSION NR: AP5025301

UR/0051/65/019/004/0562/0574
535.375.001.17

AUTHOR: Krushinskiy, L. L.; Shorygin, P. P.

TITLE: The theory of line intensities in Raman spectra

SOURCE: Optika i spektroskopiya, v. 19, no. 4, 1965, 562-574

TOPIC TAGS: Raman scattering, line intensity, harmonic oscillator

ABSTRACT: This paper is the sixth in a series dealing with the Raman scattering
theory published by the authors since 1961. A comparison is made between the
quantum and classical theories of the line intensities of Raman scattering in
different excitation regions. It is shown that away from the resonance the results
of the two theories practically coincide. Near the absorption band the quantum
treatment leads to a slightly different frequency dependence of the line intensity
than does the classical approximation. In the resonance region a satisfactory
coincidence of the results occurs only for large attenuation constants (exceeding
the half-width of the vibrational structure of the absorption) of the electronic
oscillator. For smaller constants, the classical model of the linear oscillator
with periodically varying parameters leads to a rough qualitative agreement with
the results of quantum mechanical calculations. Some of the conclusions obtained
Card 1/2

L 2127-66
ACCESSION NR: AP5025301   0

in the present paper are compared with the results of the theory developed by
A. C. Albrecht (Journal of chemical physics, v. 34, 1961, p. 1476). It is shown
that Albrecht's theory is based on the same physical assumptions as Platchek's
polarization theory. Orig. art. has: 34 formulas and 4 figures.   [CS]

ASSOCIATION: none

SUBMITTED: 21Jul64   ENCL: 00   SUB CODE: OP

NO REF SOV: 016   OTHER: 005   ATD PRESS: 4117

Card 2/2.

L 41695-65   EWT(m)/EPF(c)/EPR/EWP(j)/EWA(c)   Pc-4/Pr-4/Ps-4   RPL   WW/RM
                                                 S/0076/65/039/003/0605/0612
ACCESSION NR: AP5008909

AUTHOR: Shorygin, P. P.; Roshchupkin, V. P.; Stolyarova, L. G.

TITLE: Effect of substituents on systems of Pi bonds via a methylene bridge

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 3, 1965, 605-612

TOPIC TAGS: methylene bridge, Pi bond, ultraviolet absorption spectrum nitrile

ABSTRACT: The spectroscopic parameters of molecules of the type $X-CH_2C\equiv N$, $X-CH_2-CH_2-C\equiv N$ and $X-\bigcirc -C\equiv N$ were compared in order to establish the similari- ties and differences in the influence of substituents (X) transmitted through dif- ferent types of bridges between the groups X and CN. In addition, molecules with methylene bridges were compared: $X-CH_2-C\equiv N$, $X-CH_2-CH=CH_2$, $X-CH_2-CO-R$ (general formula $X-CH_2-\pi$) and also certain compounds of the type $X-CH_2-Ph$. In the $X-CH_2-\pi$ molecules, atom Z (the atom of group X directly adjacent to the methylene bridge) either (1) is not a heavy atom or does not have low electronegativity; (2) has low electronegativity; or (3) is a heavy atom. The influence of each type of substit- uent in each type of molecule is discussed on this basis in terms of the electron- donor and electron-acceptor capacity of the various groups. Orig. art. has: 3 tables and 2 figures.

Card 1/2

L 41695-65
ACCESSION NR: AP5008909

ASSOCIATION: Institut organicheskoy khimii, Akademiya nauk SSSR (Institute of Organic chemistry, academy of sciences of the SSSR)

SUBMITTED: 02Aug63   ENCL: 00   SUB CODE: OC ,GC
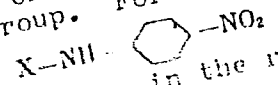
NO REF SOV: 007   OTHER: 003

Card 2/2 CW

SOURCE CODE: UR/0076/65/039/012/2868/2876

L 36960-66   EWT(m)/EWP(j)   WW/JW/RM

ACC NR: AP6014889

AUTHOR: Shorygin, P. P.; Lopatin, B. V.

ORG: AN SSSR, Institute of Organic Chemistry (AN SSSR, Institut organicheskoy khimii)

TITLE: Spectroscopic investigation of aromatic nitroamides

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 12, 1965, 2868-2876

TOPIC TAGS: spectrophotometric analysis, aromatic nitro compound

ABSTRACT: The following reasons can be advanced for the splitting of the bands of the nitro group: 1) in the solutions there exist two forms of the molecules, to which correspond somewhat differing frequencies of the nitrogroup (associated and non-associated molecules; rotational isomers); 2) the same type of molecule has two forms of vibration, with the significant participation of the nitro group (in a special case-- the Fermi resonance); and, 3) one of the components does not belong to the vibrations of the nitro group. For compounds of the type

X—NH ◯ —NO₂

a characteristic is the presence in the range of frequencies of the ... nitr... the r ... betwe ... compo ... these ... influence of the intensity ... ...ution of the intensity to a c ... medium indicates that both another vibr... group. A more probable explanation of ... of the spectrum is a change in the vibrations due ... ...nce of the frequencies of the "nitro group vibration" and vibrations in n-amino derivatives of nitrobenzene is substantially lower than in nitrobenzene and n-alkyl derivatives; in this case, alkalation of the amino group has a greater effect on the frequency of the nitro group than does NH₂. Orig. art. has: 2 figures and 2 tables.

UDC: 543.42

Card 1/2

Card 2/2

L 24306-66   EWT(1)   IJP(c)   WW/GG

ACC NR: AP6006995   SOURCE CODE: UR/0051/66/020/002/0214/0223

AUTHORS: Morozov, V. A.;   Shorygin, P. P.

ORG: none

TITLE: Contribution to the theory of resonant transformation of light by molecules with consideration of two intermediate energy levels

SOURCE: Optika i spektroskopiya, v. 20, no. 2, 1966, 214-223

TOPIC TAGS: light scattering, secondary emission, molecular interaction, light absorption, quantum electrodynamics, quantum field theory

ABSTRACT: The transformation of light by molecule is examined, taking into account four of its energy levels (two intermediate levels), on the basis of the Heitler-Ma solution of the Schrodinger equation in the energy representation for a system consisting of a molecule and a quantized radiation field interacting with it (Proc. Roy. Ir. Ac. v. 52, 109, 1949). Interest in this problem has lately been increas-

Card   1/2   UDC: 535.375.001.1

L 24306-66

ACC NR: AP6006995   ∂

ing in connection with the study of secondary emission modulation
effects. Expressions. are obtained for the intensity and shape of
the absorbed and secondary radiation lines with allowance for virtual
photon exchange between overlapping intermediate levels. In cases
where this exchange is negligible, the resulting formulas coincide
with similar ones of V. Weisskopf (Ann. Physik. v. 9, 23, 1931).
The technique employed is compared with other quantum electrodynamic
methods of considering this transformation of light by molecules.
The relationship between absorbed and secondary radiation is dis-
cussed. The authors thank L. L. Krushinskiy and L. N. Ovander for
a discussion of the results. Orig. art. has: 5 figures and 41 for-
mulas.

SUB CODE: 20/ SUBM DATE: 30Nov64/ ORIG REF: 007/ OTH REF: 010 .

Card   2/2

SHORYGIN, S. A.

"Annotated index of a astronomical literature published in August and September 1938
Astron. Zhur., 16 No. 1, 1939. (submitted 14 Oct 1938)

Report U-1510, 23 Oct. 1951.

SHORYGIN, S. L.

"Annotated index of astronomical literature published in the USSR in Oct. Nov and Dec 1938," Astron. Zhur., 16 No. 2, 1939. (Submitted 4 Feb 1939)

Report U-1512, 23 Oct. 1951.

CHORTVIN, S. A.

"Annotated index of astronomical literature published in the USSR during Jan,
Feb and Mar 1939." Astron. Zhur., 16 no. 3, 1939.

Report U-1331, 23 Oct. 1951.

SHCHICIN, S. A.

"Annotated index of astronomical literature published in the USSR in Apr and May 1939.
Astron. Zhur. 16, No. 4, 1939, (Submitted 19 May 1939)

Report U-1518, 23 Oct 1951.

"Annotated index of astronomical literature published in the USSR in Jun-Jul 1939."
Astron. Zur., 1 No. 5, 1939. (submitted 3 Aug 1939, Moscow)

Report U-1518, 23 Oct 1951.

"Annotated Index of astronomical literature published in the USSR in Aug–Sept 1939."
Aston. Zhur. 16 No. 6, 1939. (Submitted 8 Oct 1939, Moscow)

Report H-151, 23 Oct 1951.

SHORYGIN, S. A.

"Annotated index of astronomical literature published in the USSR in Oct-Nov 1939,"
Astron. Zhur., 17, No. 1, 1940.

Report U-1510, 23 Oct 1951.

Su...........

"Annotated index of astronomical literature published in the USSR in Dec 1939 and
Jan 1940," Astron. Zhur., 17, No. 2, 1940 (submitted 17 Feb 1940, Moscow)

Report U-1510, 23 Oct 1951

SHCHIGIN, S. A.

Annotated index of astronomical literature published in the USSR in Feb-Mar 1949, Astron. Zhur., 17, No. 3, 1949.

Report U-101, 10 Oct 1951.

SHORYGIN, S. A.
"
"Annotated index of astronomical literature published in the USSR in Apr-May 1940,"
Astron. Zhur., 17, No. 4, 1940. (submitted 1 Jun 1940, Moscow)

Report U-1715, 23 Oct. 1951.

SHKLYARIN, S. K.

"Annotated index of astronomical literature published in the USSR in Jun-Jul 1940,"
Astron. Zhur., 17, No. 5, 1940. (submitted 29 Aug. 1940. Moscow)

Report U-1616, 22 Oct 1951.

SHORYGIN, S. A.

"Annotated index of astronomical literature published in the USSR Aug-Sep 1940,"
Astron. Zhur., 17, No 6, 1940. (submitted 14 Oct 1940, Moscow)

Report U-1516, 23 Oct 1951.

SHCHEGOLEV, S. A.

"Annotated index of astronomical literature published in USSR in Oct-Nov 1940,"
Astron. Zhur., 1?, No. 1, 1941. (submitted 1 Dec 1940, Moscow)

Report U-1512, 23 Oct 1951.

SHCHYOTT, T. A.

"Annotated index of astronomical literature published in the USSR Apr-May 1941,"
Astron. Zhur., 1 , Nos 4-5 1941. (submitted 19 Jun 1941, Moscow)

Report U-1510, 23 oct 1951.

SHORYGIN, S. A.

USSR/Physics
Astronomy
Bibliography

"Annotated Index No 54 of Astronomical Literature,"
B. A. Shorygin, 8 pp

"Astron Zhur" Vol XXV, No 3

Lists astronomical works published in USSR in Feb and Mar 1948: (a) books, pamphlets and collections of articles, (b) syllabuses, (c) ephemeral, (d) periodicals and publications of institutes and observatories, (e) articles in journals of general character, and (f) bibli- ographies.

May/Jun 1948

USSR/Physics (Contd)

Nucleus ~2 .   Even this model is unsatisfactory, however, since it does not explain energy output of giant stars.   One must suppose that in red giants, as distinct from stars, there is no main series of con- vective nuclei.

May/Jun 1948

76T102

SHORYGIN, S. A.   FA 14/49T107

USSR/Physics   Jul/Aug 48
    Astronomy
    Bibliography

"Astronomical Literature, Published in USSR in April
and May 1948," S. A. Shorygin, 4 pp

"Astron Zhur" Vol XXV, No 4

Lists author, title, date and price of each work.

14/49T107

SHORYGIN, S. A.

PA 56/49T8

USSR/Astronomy
    Literature
    Jet Planes

Nov/Dec 48

"Index No 57 of Astronomical Literature Published in
the USSR in August and September 1948," S. A. Shory-
gin, 6 pp

"Astron Zhur" Vol XXV, No 6

Includes: "Astronomic Report on the Eclipse of
9 May 1948," by the Irkutsk Astr Obs and the Irkutsk
Oblast Sec of VAGO (All-Union Astr Geod Soc), B. V.
Lyapunov's pamphlet, "From the Rocket to the Jet
Plane," and I. F. Polak's "The Planet Mars and the
Plane,"

56/49T8

USSR/Astronomy (Contd)   Nov/Dec 48

Question of Life on It." Also lists circulars
from various observatories.

56/49T8

SHORYGIN, S. A.

"Annotated Index No. 30 of Non-periodic Literature on the Physical Sciences Published in the First Half of 1947." USPEKHI FIZ. NAUK, 34, No. 1, 1948.

SHORYGIN, S. A.

PA 12/49T102

USSR/Physics   Apr 48
    Bibliography

"Annotated List No 33 of Literature on Physical
Sciences, Published in the USSR in January and
February 1948," S. A. Shorygin, $13\frac{1}{4}$ pp

"Uspekhi Fiz Nauk" Vol XXXIV, No 4

Lists works under headings "Books and Pamphlets,"
"Publications of Institutes and Universities," and
"Articles in Journals."

12/49T102

SHOPYGIN, S. A.

"Annotated List No. 34 for Literature Dealing with Physical Sciences which were Published in the USSR in March 1949." 35, No. 1, 1949.

SHORYGIN, S. A.

"Annotated List No. 35 for Literature Dealing with Physical Sciences which was Published in the USSR in April 1948." 35, No. 2, 1948.

SHORYGIN, S. A.

"Annotated List No. 36 for Literature Dealing With Physical Sciences which was Published in the USSR in April 1948." 35, No. 3, 1948.

SHORYGIN, S. A.

"Annotated List No. 3 of Literature Dealing with Physical Sciences which was Published
in the USSR in May 194?." 35, No. 4, 1948.

SHORYGIN, S. A.

PA 48/49T3

USSR/Academy of Sciences
    Physics
    Publications

Sep 48

"Annotated Index No 38 of Literature on the
Physical Sciences, published in the USSR in July
1948," S. A. Shorygin, 12 pp

"Uspekhi Fiz Nauk" Vol XXXVI, No 1

List of some 140 articles, books and pamphlets on
physics includes: Ya. I. Levinson's "Physical
Fundamentals of Aerodynamics at High Speeds,"
K. F. Teodorchik's "Auto-Oscillating Systems,"
P. V. Shmakov's "Color Television," "Collected

48/49T3

USSR/Academy of Sciences   (Contd)

Sep 48

Works of the Institute of Natural History," and
several articles by Teander, Ivanenko, Avak'yants
and Gelanin on various aspects of the atom.

48/49T3

SHORYGIN, S. A.

"Annotated Index No 39 on Literature of Physical Sciences, Published in USSR in August 1948,"
S. A. Shorygin, 12 pp

"Uspekhi Fiz Nauk" Vol XXXVI, No 2

Lists 116 articles, books, and pamphlets in physics published in August 1948. Among authors mentioned are: S. Z. Belen'kiy ("Shower Processes in Cosmic Rays"), M. V. Belyakov ("Action of Meteorological Conditions on the Propagation of Ultrashort Waves"), and B. V. Lyapunov ("History of Aviation From the Simple Rocket to the Jet Plane"). Lists instruments and equipment, and an explanation of their character-istics, manufactured by the "Fizelektropribor" Factory.

33/49T103

SHORYGIN, S. A.

26296 Annot[...]cheskoi literatury, opublikovannoy v
SSSR v aprele I maye 1949 G. Astron furnal, 1949, VYP. 4, s. 26[...]

SO: LETOPIS' NO. 35, 1949

.1435.   HOLYGIN, . .

Annotirovannyy ukazatel' No. 62 astronomicheskoy Literatury, opublikovannoy v SSSR v iyune i iyule 1949 g. Astron. zhurnal, 1949, Vyp. 5, s. 324-28

SHORYGIN, S. A.

   "New Books on Physics and Astronomy (bibliographical index including 78 titles of
books and articles with 17 annotations), Fizika v Shkole, Vol. IX, No. 6, PP 84-87, 1949.

SHORYGIN, S. A.

37868   annotirovannyy ykazatel' No. 63. astromonicheskoy literatury,
opublikovannoy v sssr v avguste i sentyabre 1949 g. astron.
zhurnal, 1949, vyp. 6, s. 378-82.

So.   Letopis' Zhurnal'nykh Statey, Vol. 47, 1949

PA 42/49T3

SHORYGIN, S. A.

Mar/Apr 49

USSR/Astronomy
    Bibliography

"Annotated Index No 59 of Astronomical Literature
Published in the USSR in December 1948 and January
1949," S. A. Shorygin, 5 pp

"Astron Zhur" Vol XXVI, No 2

Lists 67 articles, books and brochures on astron-
omy. Gives notice of a series of informative
bulletins based on data obtained at Soviet
observatories. Mentions article by Izotov,
"Essay on the Study of the Shape of the Earth,"
in "Fizika v Shkole" (Physics in School), No 5,
1948.

42/49T3

SHORYGIN, S. A.

58/49T5

USSR/Astronomy
Planets

May/Jun 49

"Conference on the Physical Aspects of Planets,
15 - 16 December 1948," S. A. Shorygin, 2 3/4 pp

"Astron Zhur" Vol XXVI, No 3

Conference convened by Astr Council, Acad Sci
USSR, at the Astr Obs, Leningrad State U 1meni
A. A. Zhdanov, was attended by representatives
of various astronomical institutions. Seven-
teen specialists participated. Prof V. V.
Sharonov, chairman of conference, emphasized
importance of Soviet studies of planets.

58/49T5

USSR/Astronomy (Contd)   May/Jun 49

Necessity for establishing systematic large-
scale studies of planets was emphasized. Many
reports on cosmic studies, observation of
planets, etc., were made.   Gives text of
resolutions adopted.

58/49T5

SHORYGIN, S. A.

USSR/Astronomy
Literature

May/Jun 49

"Annotated Index No 60 of Astronomical Literature Published in the USSR During February and March 1949," S. A. Shorygin, $5\frac{1}{2}$ pp

"Astron Zhur" Vol XXVI, No 3

Lists various books on astronomy, giving author, title, publisher, and price. Among others: Prof B. A. Vorontsov-Vel'yaminov's "Gaseous Mists and New Stars," Ye. L. Krinov's "Meteorites," and O. Yu. Shmidt's "Four Lectures on the Origin of the World,"

58/49T3

60/4915

SHORYGIN, S. A.

USSR/Astronomy
    Literature

Jul/Aug 49

"Bibliography of Astronomical Literature Published
in the USSR, April-May 1949," S. A. Shorygin; 5 pp

"Astron Zhur" Vol XXVI, No 4

Includes a translation of G. Gertner's book,
"Transparency of Cloudy Atmosphere for Infrared
Waves," N. N. Sytinskaya's book, "Absolute Photom-
etry of Scattered Stellar Objects," and V. S.
Sukhorukikh's "The Microscope and the Telescope."

60/4915

SHORYGIN, S. A.

"Astronomical Index No. 62 of Books, Brochures, Symposia, Ephemerids, Periodicals,
Articles and Bibliographies Published June-July 1949" 26, No. 5, 1949. -c1949-.