Smoking and health. Liječn. vjesn. 86 no.11:1325-1340
N. 64.

1. Iz Skole narodnog zdravlja "Andrija Stampar" Medicinskog fakulteta u Zagrebu.
KESIOKI, A.

State of the chemical industry during the 2nd quarter 1962.
Przem chem 41 no.127733 D '62.
KESICKI, Apolinary

The execution of the planned tasks of the chemical industry during the first quarter of 1962. Przem chem 41 no.8:469-470 Ag '62.
KESICKI, Z.
The freezing of lubricating ducts and its prevention. p. 333.
(PRZEGŁAD KOLEJOWY MECZANICZNY. Vol. 8, no. 11, Nov. 1956, Warszawa, Poland)

S0: Monthly List of East European Accessions (EEAL) LC. Vol. 6, No. 12, Dec. 1957.
Uncl.
KESICKI, Z.; WOJCIECH, E.

Damages of locomotives under way. p. 115.

PŁEŚNIAŁ KOŁOWY MECHANIZMY. Warszawa, Poland, Vol. 10, no. 4, Apr. 1958.

Monthly List of East European Accessions (EEAI), LC, Vol. 8, no. 9, September, 1959. Uncl.
KESICKI, Zygfryd, ins.

Analysis of the carrying out of the repair plan of locomotives in the Polish Railroad Rolling Stock Repair Shops in 1960.

Przegląd kolej mechan 13 no.3:86-91 Mr '61.
KESICKY, J.


(Rudy, Vol.1, No.2/3, Apr. 1953, Praha.)

KESICKY, J.

"Sorting on a Rake Grader." p. 53 (Rudy, Vol. 1, No. 4, June 1953) Praha, Czechoslovakia

KESICKY, J.


SO: East European Accessions List, Vol. 3, No. 9, September 1954, Lib. of Congress
KESICKY, J.


Akins, A.

Kings mechanical spiral servers. P. 110.

CT: East European Accretions List, Vol. 1, No. 9, Sept. 1967, Lib. of Congress
KESICKY, J.

Methods and possibilities of processing minerals in Slovakia. p. 579.

KESICKY, J.

"Coal crusher." p. 6.


Monthly list of East European Accessions (EEAL), LC, Vol. 6, No. 8, August 1959.
Uncia.
Kessick, J.

"Flotation of nonsulfuric copper ores." p. 101


Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 9, Sept. 1959

Uncld.
KEŚICKY, J.

Grade of crushing by roll or jaw crushers, p. 259, TECHNICKÁ PRÁCA (Statne nakladeatelstvo technickej literatury) Bratislava, Vol. 7, No. 6, June 1955

KESICKY, J.

Measurement of froth in the cre-dressing process.

TECHNICKA PRACA. Czechoslovakia Vol. 7, No. 8, Aug. 1955

Monthly List of East European Accessions (EEAI), LC. Vol. 8, No. 9, September 1959 Uncl.
KESICKY, J.

Reports on ore processing in ore-dressing plants. p. 121

Various flotation methods in processing graphite. p. 122.

RUDY Vol. 4, no. 4, Apr. 1956

Czechoslovakia

Source: EAST EURO-EAN LISTS Vol. 5, no. 7 July 1956
KESICKY, J.

KESICKY, J. Contribution to wet mineral dressing. p. 102

Vol. 8, no. 3, Mar. 1956
TECHNICKA PRACA
TECHNOLOGY
Bratislava, Czechoslovakia

So: East European Accession Vol. 6, no. 2, 1957
KESICKY, J.

Maintenance of machinery and other installations of ore-dressing flotation plants.

P. 147, (Rudy) Vol. 5, no. 4, Apr. 1957, Praha, Czechoslovakia

SO: Monthly Index of East European Acquisitions (EEAI) Vol. 6, No. 11 November 1957
KESICKY, J.

Output of spherical drum mills without sleeves used for wet milling.

P. 254, (Rudy) Vol. 5, no. 7, July 1957, Praha, Czechoslovakia

SO: Monthly Index of East European Acessions (EEAI) Vol. 6, No. 11 November 1957
KESICKY, J.

"Calculating some functional elements in drum mills. p. 20."


Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 6, Jun 59, Unclas.
KESIK, A.


KUJIK, A.

In the kingdom of canyons. p. 10.
No. 8, Aug. 1955. TYRYSTA. Warsaw, Poland.

So: Eastern European Accession. Vol 5, no. 4, April 1956
KESIK, A.

KESIK, A. Bend of the Kamienna River near Bältow.
p. 7, No. 12, Dec. 1956
Warszawa, Poland
Turysta

SOURCE: East European Accessions List (EXAL) Vol. 6, No. 4—April 1957
KESIK, Jozsef, mernok

Some problems of disseminating technical knowledge in Győr-Sopron County. Term tud közl 6 no.,101477 0 '62.

1. Tudományos Ismeretterjesztő Tarsulat Győr-Sopron megyei műszaki szakosztályának titkara.


(MYOCARDIUM metab)
(QUNINE pharmacol)
(QUNIDINE pharmacol)
(PROCAINE pharmacol)
(PROCAINE AMIDE pharmacol)
KESIK, M.; MAZUROWA, A.; MAZUR, M.

Experimental studies on the effect of quinine, quinidine and procaine amide on ECG and on oxygen consumption by the heart muscle. Polskie arch. med. wewn. 31 no.4:469-479 1961.


(ELECTROCARDIOGRAPHY pharmacol) (MYOCARDIUM metab)
(QUININE pharmacol) (QUINIDINE pharmacol)
(PROCAINE pharmacol) (PROCaine AMIDE pharmacol)


(PARAAMINOBENZOIC ACID) (AMINO ALCOHOLS) (PROCAINE) (ESCHERICHIA COLI)
K. SPAIL, J.

The birds which winter in Central Estonia (by the springs of Sopa-Norra and Varangu), p. 93

ESTI LEEMIS. (Eesti NSV Teaduste Akadeemia) Tartu, Estonia. No. 2, Mar. 1929.


Uncit.
KUSZTÉNY, F.

FOR- ES CIOTECHNIKA. (Peripari Tudományos Egyesület mint a Magyar Tudományos Egyesületek Szövetsége Taggyesülete) Budapest.

Recent features: News of the Association;
Index for 1955.
Index for 1956.

Enzyme steeping of furs. p. 190.

Vol. 8, No. 6, Dec. 1958.

KESKENY, F.

Remarks about Laszio Wiedner and Ferenc Kolos' article "New Liiming Processes."

SOURCE: East European Accessions List (EEAL), Library of Congress,
KIEKÉNY, F.; Morval, L.

Fur industry in the Soviet Union, p. 123.


The wage system which excludes equalization. Sots. trud 7 no. 12: 118-123 (MIRA 16:2)

1. Zamestitel' nachal'nika otdela truda i zarabotnoy platy Noril'skogo gornometallurgicheskogo kombinata (for Protasov). Starshiy inzh. otdela truda i zarabotnoy platy Noril'skogo gornometallurgicheskogo kombinata (for Kesko).

(Noril'sk—Wages—Nonferrous metal industries)
AUTHOR: Keskela, R. (Tallin)

TITLE: UR2KAA. A New-Year Questionnaire (Novogodnya anketa)

PERIODICAL: Radio, 1957, Nr 1, p 15 (USSR)

ABSTRACT: In 1956, the author's most remote contact was with New Zealand, a distance of 18,000 km. On October 19, 1956, contact was established with the Soviet North Pole station, and a few minutes later with the Soviet South Pole station; then the author helped the two polar operators to find each other and establish a direct contact. During the last months of 1956 the author worked shortwave hams in 150 countries.

AVAILABLE: Library of Congress
A disadvantage of the use of aqu. alc. KOH is that the mother liquor is less stable so that the isolation of the xanthate remaining in solid is more difficult. Sulfation of the laur fraction is not to be recommended because in this manner a product was obtained having a high content of free alkali. In general, the yields were better when the excess of the original materials. The product I was best separated by centrifuging and dried at 40–50°.

For the production of 1000 kg xanthate using ground KOH (95%), 95% alc. and technical CS with an alc. KOH ratio of 1, about 800 kg. KOH, 500 kg alc. and 588–600 kg. CS were required. Cast iron, wrought iron, or Cr–Ni-plated iron are suitable for construction of the equipment required. Na xanthate could be prepared as simply as the K salt. The reaction was carried out with the smallest possible excess of alc. and CS (1:1 mol of each per mol Na(NH)). The homogeneity of Na(NH) in alc. was lost after, and the CS added at such a rate that the temp. was kept at 30–35°. After all the CS had been added, the mixture was stirred until it became solid.

The raw product was dried in thin layers in the air at 15–20° for 24 hrs. and then for 2–3 days at temp. up to 70°. In this way 99–95% of a product conta. 90–94% Na xanthate was obtained. In the presence of alk. surfactants such as benzene or CCL, the reaction occurred even at 10–20° and with better yields but the loss of solvent was large.

W. A. Mower
Potassium and sodium selenates of the higher alcohols.
J. V. Kesekalya, S. B. Grassman, Ch. I. Kondrat'ev,

The preparation of K- and Na-selenates can be prepd. from
the alcohols listed below and from tech. selenic acid.

The potassium selenate (KSeO₄) is a white, crystalline
solid, mp 300°C, and is stable in air. The sodium selenate
(Na₂SeO₄) is a yellowish-red, crystalline solid, mp 155°C,
and is also stable in air.

The following are the properties of these selenates:

- **Potassium selenate (KSeO₄)**:
  - Color: White
  - Melting Point: 300°C
  - Stability: Stable in air

- **Sodium selenate (Na₂SeO₄)**:
  - Color: Yellowish-red
  - Melting Point: 155°C
  - Stability: Stable in air

These compounds are used in various applications, including
in the production of selenide compounds and as a source of selenium.

Further details and specific applications can be found in the
original source or additional scientific literature on the subject.

W. A. Moore
Inspection of welds on a thick-walled reactor vessel with a betatron

Control of castings with the Czechoslovak 15 MeV betatron. 
Strojirenstvi 14 no.7:532-536 Jl '64.

1. OJE, Zavody V.I. Lenin National Enterprise, Plzen.
Tests were done on a neuromuscular preparation (sciatic nervestragaster and semitendinosus muscles) of a frog. The nerve touched the polarizing electrode in two places, and between them - induction electrodes. The excitability was studied at the polarization point of constant current (CC). At the anode point of polarization the excitability was considerably lowered. In control tests, lowering of excitability was also noted in the regions of an electrotonus at an 0.5 cm distance from the point of polarization, but in a smaller degree than at the point of polarization. In macrointervals at the cathode point of polarization, no significant changes in excitability were noted. When opening impulses of inductive current were sent to the nerve, surpassing somewhat the strength of the rheobase, then right after the shut-off of CC there was some increase in the excitability, of the order of 1 - 2 cm. Evidently, in the nerve at the point of polarization after the first few seconds of CC action, there occurred adaptation. In the region of cath-electrotonus at the distance of 0.5 cm, from the point of polarization, an increase in excitability was noted. -- F. I. Amuladze
Some derivatives of phthalazine and pyridazine as potential hypotensive agents. S. Hrnčíř, A. Hřebočka, J. Češka, V. Bízek, B. Korte, and L. Hrnčířová (Institute of Toxicology, Prague, Czechoslovakia).—Hypotensive agents less toxic than 1-hydrizinophthalazine (I) hydrochloride are sought.

1. N-Carboxy-4'-phthalazinone-pyridazine (II) hydrochloride. N-deriv., cf. 1. N-Carboxy-4'-phthalazinone-pyridazine (II) hydrochloride, m. 212° (decomp.), and 1,4-dinitro-4'-phthalazinone-pyridazine (III) hydrochloride, m. 207° (decomp.) are prepared from 1 and 1,4-dihydrizinophthalazine (IV) resp. Condensation in pyridine soln. of aldehydes (V) and with 3-hydroxy-2-nitro-1,4-benzodiazepine (VI) with N,N-diethylcarbamoyl chloride (VII) HCl, H2O, m. 248° (decomp.), was prepared from 6-amino-3-chlorophthalimide (cf. Borche, et al., J. A. 28, 4009) by exchange of NH4Cl, bromination, hydrolysis, action of POCI3, and 2N HCl. The order of decreasing pharmacological activity is: 1-hydrizinophthalazine > VI > V > IV. VI in Me2NCH2COOMe soln. had transient hypotensive effects on animals. Toxicity of NH2 is 1/4 of that of I or IV. No exp. details are given. J. Stockl.
Anesthesia in coronary sclerosis. Khirurgia 35 no.6:12-16
Je '59.

Iz Instituta klinicheskoy i eksperimental'noy khirurgii (dir. -
dots. B. Shpachek), Praha-Krch.
(CORONARY DISEASE, surg.
anesth. in surg. of insuff. (Rus))
RESLER, C. N.

DUBININ, N. P.; SHCHERBAKOV, V. K.; KESLER, G. N.


I. Institute of Biological Physics, Academy of Sciences of the U.S.S.R., Moscow.
DUBININ, N.P.; SHCHERBAKOV, V.K.; KESLER, G.N.; SUYKOVA, L.A.

Specificity of the object in induced mutagenesis, Dokl. AN SSSR
165 no.1:210-213 N '65.

1. Institut biologicheskoj fiziki AN SSSR. 2. Chlen-korrespondent
AN SSSR (for Dubinin).
DUBININ, N.P.; SICHENINOV, V.K.; KESLEN, G.K.

Chromosome mutation spectrum at different levels of natural cell mutation. Dokl. AN SSSR 161 no.6:1434-1436 Ap '65. (MIRA 18:5)

1. Institut biologicheskoy fiziki AN SSSR. 2. Chlen-korrespondent AN SSSR (for Dubinin).
KESLER, I.

Some problems from the theory of the ratio detector. p. 591.
(Archivum Elektrotechniki, Warszawa, Vol. 5, no. 4, 1956.)

Yugoslavia. From the paper "E. M. 609", 1968. Details are description is given of a simple apparatus. Capacity is determined with a precision of 0.01 pF.

N. Pavlovć
KESLER, Kh.


Report presented at the Symposium on Concepts of Conformation in Organic Chemistry which took place in Moscow at the IOKh AN SSSR (Institute of Organic Chemistry, AS USSR) from September 30 to October 2, 1958.

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, No. 3, 561-564.
AUTHORS: Kesler, Kh., Pentin, Yu.A., Treshchova, Ye.S. and Tatevskiy, V.M.


PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 3, pp 301-310 (USSR)

ABSTRACT: The paper reports a study of the infrared absorption spectra of nine hydrocarbons at temperatures from room temperature (liquid phase) and at low temperatures (solid phase). The study was undertaken to find out the changes in the spectra which occur on solidification.

The hydrocarbons studied were normal alkanes (n-heptane, n-octane), branched alkanes (3-methylheptane, 2,3-dimethylheptane, 2,4-dimethylpentane, 2,5-dimethylhexane, 2,2,5,5-tetramethylhexane) and branched alkanes (2-methylheptane-2, 3,3-dimethylheptane-1). All these hydrocarbons were prepared and their properties determined in outside laboratories (acknowledgments are made to Prof. R. Ya. Levina and to A.V. Iogansen in this connection). Table 1 gives the degree of purity, the melting and crystallization points and the refractive index at 20°C (nD 20) of the nine hydrocarbons listed above. The infrared spectra were recorded in the region from 700 to 1800 cm⁻¹ by means of a two-beam infrared spectrometer IKS-2 with a NaCl prism. The optical slit width was 7-10 cm⁻¹.
Investigation of the Infrared Absorption Spectra of Hydrocarbons at Various Temperatures Both in the Liquid and Solid Phases

For liquids, cells with effective layer thickness from 0.03 to 0.45 mm were used. At low temperatures a special cell was employed; its construction ensured the constancy of the layer thickness of a liquid or solid in it. Measurements were carried out at temperatures from +20°C to -172°C. In order to obtain good crystals and to avoid vitrification, the hydrocarbons were cooled slowly. Figs 1-3 show absorption spectra of the nine hydrocarbons at various temperatures. Tables 2-4 give the observed absorption maxima for the liquid and solid phases. The results obtained show that in the case of 2,4-dimethylpentane and 2,5-dimethylhexane only one (the most symmetrical) isomer exists in the crystal phase, but more than one rotational isomer is present in the liquid phase. The authors suggest that only those substances crystallize out which have one rotational isomer of sufficiently high symmetry necessary to form a correct molecular crystal lattice. There are 3 figures, 4 tables and 10 references, 3 of which are Soviet and 7 English.

SUBMITTED: November 26, 1958

Card 2/2
Hg-Pd, D. Erdemir, N. Grigoras, and M. Recher, "Acta C.N.R. 21, 37 (1971); 22, 50 (1975)."

Pd (50 g) and 40 g Hg were heated to 10 hrs in a sealed tube of high melting glass in an atm. of CO. At the bottom the tube was kept at 389-399°C and in the center at 257°C. Cooling took 2-3 hrs. The low part of the tube contained Hg/Fe (10%) of theory). Hg, Hg, and red-crystal amorphous Pd. Well-developed crystals were obtained occasionally when the process was repeated with 1/4 of the above amounts. The compon. cannot be analyzed according to the Volhard method; the Soper-Carl-Liebig method was used. HgPd can be prepd. also from 2 g Pd and 8 g Hg in a sealed glass tube by heating for 10 hrs.

The crystals are monoclinic. The unit cell and space lattice group were detd. from oscillation photographs taken with filtered CuKα radiation. α = 12.07, β = 12.41, and γ = 17.16 A; ε = 120.2°. As the density is 7.09, the unit cell must contain 12 stoichiometric units of HgPd; thus the space lattice group is C2h - P21c.

Werner Jacobson
YUGOSLAVIA/Flitting Out of Laboratories - Instruments. Their Theory, Construction, and Use.

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 6678

Author : Kesler, M., Pregernik, A.
Inst : None
Title : A Simple Apparatus for Determining Dielectric Constants


Abstract : The apparatus described is constructed entirely from commercial radio parts. Particular attention has been paid to the elimination of interference by the mutual capacitance between the conductors and in the oscillator circuit. A sharper resonance curve has been obtained by the utilization of a coil with a ferromagnetic core. The accuracy of the capacitance measurements attains 0.01 μf.

Card 1/1

YUGOSLAVIA/Physical Chemistry. Molecule. Chemical bond.

Abs Jour : Ref Zhur - Khimiya, No 7, 1957, 22017

Author : Kesler, M.
Inst : None
Title : Dipole moment and molecular structure of phthalylurea


Abstract : Dipole moment of phthalylurea was determined. Comparison with dipole moment calculated for formula I and II was made

\[ \begin{align*}
\text{I } & \text{C}_6\text{H}_4 \text{CONH} \quad \text{CO} \quad \text{and II } \text{C}_6\text{H}_4 \text{CONH} \quad \text{CO} \quad \text{NCONH}_2
\end{align*} \]

The calculated dipole moments are very different, whereby the value calculated for II is in good agreement with the experimental, which equals to 4.65 D.

Card 1/1

Zagreb, Yugo.
KESLER, H.

The bond angle of sulfur in alkyl mercuric sulfides determined by the dipole moment method. Croat chem acta 34 no.2:123-126 '62.

1. Laboratory of General and Inorganic Chemistry, Faculty of Science, University of Zagreb, Zagreb, Croatia, Yugoslavia.
KESLER, M.


1. Laboratory of General and Inorganic Chemistry, Faculty of Science, University of Zagreb, Zagreb Croatia, Yugoslavia.
KESLER, M.

Structural investigations of alkyl mercury sulphide, alkyl mercury oxide and alkyl mercury halide by dipole moment method. Croat. chem. acta 36 no.3:165-168 '64.

1. Institute of General and Inorganic Chemistry of the Faculty of Mathematics and Natural Science of the University of Zagreb, Zagreb. Submitted February 28, 1964.
Experimental hypertension produced by stenosis of the thoracic aorta. Khirurgia no.8:35-38 Aug '54.

1. Iz Fiziolohicheskogo instituta (dir. prof. P.Balint) i Kliniki usovershenstvovaniya khirurgov (dir. prof. I.Litman) Budapeshtskogo universiteta.

(HYPERTENSION, experimental, prod. by stenosis of thoracic aorta) (AORTA, stenosis, exper. prod. of hypertension)
Radiology

BULGARIA

ZOGRAFOW, D., BAEV, I., and KESLEV, D., Institute of Radiology and Radiation Hygiene (Institut po radiologiya i radiatsionna khigiena) (Docent I. Nikolov, Director)

"Intraperitoneal Administration of a Bone Marrow Suspension in Acute Radiation Sickness"

Sofia, Rentgenologiya i Radiologiya, Vol 5, No 1, 1966, pp 32-40

Abstract: On irradiation of rats with X-rays in a dose LD97.5, intraperitoneal administration of homologous bone marrow was less effective (35% survival) than intravenous injection (65% survival). Study of the peripheral blood, bone marrow, and inclusion of Fe59 in erythrocytes indicated that there was no significant difference in the regeneration of hemopoiesis between animals treated by the two methods. On transplantation by intraperitoneal injection of rat bone marrow to irradiated mice, granulocytes containing alkaline phosphatase (i.e., rat granulocytes) were not found in the bone marrow of the mice. This indicated that donor elements were not implanted in the bone marrow of recipient animals after intraperitoneal introduction. The rapid regeneration after intraperitoneal administration of bone marrow is explained by humoral stimulation, while the high therapeutic effect on intravenous administration is ascribed to development of donor cells in the bone marrow of recipient animals. The

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fact that donor cells were implanted in the bone marrow in the latter case was confirmed by the results of experiments in which rat bone marrow was injected intravenously to mice. Table and graphs, 23 references (2 Bulgarian, 21 Western). Russian and English summaries. [Manuscript received Sep 64]
KRASHENINNIKOV, A.N., kand. tekhn. nauk; KESLI, E.O., inzh.

Properties of an air-entrained concrete mix and of air-entrained concrete before steaming. Bet.1 zhel.-bet. 8 no.91418-422 S '62. (MIRA 15:12)

(Air-entrained concrete—Testing)
SKIBA, L.o.A.; KESLINA, Ye.Z., starshiy nauchnyy sotrudnik

Warping of filaments should be shifted to the synthetic fiber plants. Tekst. prom. 21 no. 3:67-68 Mr '61. (MIRA 14:3)

1. Zaveduyushchiy laboratoriyey ekonomicheskikh issledovaniy UkrNIIPV (for Skiba).
(Synthetic fabrics)
SKIBA, L.A. [Skyba, L.A.]; KESLINA, Ye.Z. [Keslina, IE.Z.]

Avilage and oiling are factors improving the characteristics of rayon before knitting. Leh. prom. no.4; 67-69 0-D '62. (MIRA 16:5)

1. Ukrainskiy nauchno-issledovatel'skiy institut po pererabotke iskusstvennogo i sinteticheskogo volokna. (Rayon) (Knit goods)
YESHAYI, Y.


KESMINAS, A.

The problem of determining the optimum depth of wear of a dam for a hydroelectric power station. Liet ak darbai B no.2:191-201 '60.

1. Lietuvos TSR Mokslu akademinio Energetikos ir elektrotechnikos institutas
   (Hydroelectric-power stations) (Dams)
ZOLOTAREV, T.L., doktor tekn.nauk, prof.; KESMINAS, A.P., inzh.

Forecasting of the annual distribution of stream flow. Trudy MEI no 351, 157-164 '61. (Water power) (Hydroelectric power stations)
Determination of carbon dioxide in the atmosphere.


1958, Abstr. No. 51979.---A transportable app. for the detn.

d of CO₂ in the air is described. The basic parts of the app.

are the reservoir which consists of joined tubes parallel to

each other and of an inner diam. 10 mm., of a membrane, a

pump, and a washer with a Ba(OH)₂ soln. (0.02 N Ba(OH)₂

in a 1% BaCl₂ solution). At a 0.01-0.7% concn. of CO₂ in

the air an app. with 350 ml. tube vol. is used, but at 0.02-

0.2% CO₂ an app. with 1 l. tube vol. washed after entering

the pipes the air sample circulates at least 8 times

through the tubes, the pump, and the washer. After the

absorption of CO₂ (7-10 min. of pumping operation) the

soln. in the washer is titrated with a 0.02 N H₂C₂O₄ soln. or

with HCl, with phenolphthalein as indicator. The Ba-

(OH)₂ soln. is stored in a rubber balloon. The washers are

filled with this soln. without any contact with the air.

The results are very precise.

G. G. Tsvetin
KESNER, Oldrich, inz.

KESNER, Vjekoslav (Zagreb)


1. Clan Redakcionog odbora, "Nonmetalit"
KESHER, Vjekoslav

Ore deposits in the region of Zagreb, and possibilities of their exploitation. Kemi Ind 12 no. 11: 861-863  N '63.
KESOVA, S.K.

USSR/General Problems of Pathology - Allergy.

Abs. Jour : Ref Zhur - Biol., No 3, 1956, 12548


Inst. : Not given

Title : The Treatment of Bronchial Asthma by Intrathoracic Injection of Blood.

Orig Pub : Sb. tr. Azerb. n.-i. in-ta kurortol. i fiz. metodov leche-
niya, 1956, vyp. 2, 115-119.

Abstract : These are the results of intrathoracic instillation of
blood into 7 patients, most of whom had severe cases of
long duration. 5-10 ml of compatible donor's blood, or
the patient's own blood, to which 1.5-2 ml of 10% CaCl2
solution had been added as a preservative, was introduced
intrathernally each week with an average of 8 transfu-
sions in all per patient. Sixty-six patients were cured.

Card 1/2

"Paleogeographic Conditions of the Life of Men in the Desert."

Report to be submitted for the Intl. Geographical Union, 10th General Assembly and
KESS, J.; CIchocka, E.; P.WLODZKA, Z.

Characteristics of synthetic fibers and their application to the production of protective clothing. p. 13.


Monthly list of East European Accessions (EEAI) LC. Vol. 6, No. 9, Sept. 1559 uncla.
KESS, J.

Modern protection of the head against blows. p. 31

OCHRONA PRACY. (Centralna Rada Związków i Centralny Instytut Ochrony Pracy)
Warszawa, Poland
Vol. 38, no. 6, June 1959

Monthly list of East European Accessions (EEAI) LC Vol. 8, no. 9
Sept 1959
Uncl.
KHLEBOV, R., inzh.; KESSEL', A., inzh.

New pebble remover. Mek.-elec. prom. 26 no. 11:25-27
N '60.

1. Gor'kovskiy mashinostroitel'nyy zavod im. Vorob'yeva.
(Grain--Cleaning)
KESSEL', A., insh.

ZSK-20, a new grain-cleaning separator. Mekh.-elev. prom., 27
no. 10.13-14 o '61.

1. Nachal'nik eksperimental'nogo byuro Gor'kovskogo mashinostroitel'nogo zavoda im. Vorob'eva.

(Grain-Cleaning)
KESSEL', A., inzh.; UKHAM', Z., inzh.; PATRIN, Yu., inzh.;
DEMSKIY, A., inzh.

New machines for flour and groat mills. Mek.-elev., prom. 28
no.1:10-13 Ja '62. (MIRA 16:7)

1. Gor'kovskiy mashinostroitelnyy zavod im. Vorobj'eva
(for Kessel', Ukhan', Patrin). 2. Gor'kovskiy mashinostroiteln-
nyy zavod im. Vorobj'eva (for Demskiy).
(Grain-milling machinery)
Resonance Absorption of Ultrasound on Nuclei
(Rezonansnoye pogloshcheniye ultrazvuka na yadrakh)

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 5, pp 1451-1456 (USSR)

On a paramagnet located in a magnetic field $H_0$, sound of the
frequency $\nu$ is subjected to resonance absorption if $h\nu = g\beta H_0$
($g$ - splitting factor, $\beta$ the Bohr magneton). Al'tshuler (Ref 1)
developed the theory of this phenomenon and also developed a
formula for the resonance absorption coefficient $\sigma$; he also
computed $\sigma$ for a number of substances. It was shown experi-
mentally that nuclear spin transitions may be caused by ultra-
sonic waves. On In$^{115}$-nuclei ultrasonic resonance absorption
has already been found by direct observation. The author of the
present paper develops a theory of ultrasonic resonance absorp-
tion on paramagnetic nuclei of atoms with simple cubic lattice.
He bases on the assumption that spin-lattice interaction is
determined by the nuclear quadrupole forces.
Resonance Absorption of Ultrasound on Nuclei

First, formulas are derived for the spin-lattice interaction operators, next for the matrix elements of spin-lattice interaction and the absorption coefficient, first for sound propagation vertical, and then parallel to the magnetic field. For some substances the parameters are numerically computed and then tabulated (Tables 1, 2). For the spin transitions $\Delta m = 1$ and $\Delta m = 2$ expressions are derived for the absorption coefficient at any direction of sound propagation and arbitrary polarization of sound waves. Comparison with the experiment is possible only for In$^{115}$ in InSb; at $\nu = 9.976$ Megacycles, $H_0 = 10.69 \times 10^3$ G and 5.35 $\times 10^3$ G for $\Delta m = 1$ and $\Delta m = 2$ respectively, the author, who carried out the experimental investigation, obtained the value 0.66 for the ratio of the absorption maxima of the transitions $\Delta m = 1$ and $\Delta m = 2$. Theoretically, 0.41 is obtained, but in that case it was assumed that the line width of the signals is the same, whereas actually the line width of the signal $\Delta m = 2$ is somewhat narrower, which would mean that the ratio obtained would become somewhat higher.

The author thanks Professor S. A. Al'tshuler for his valuable advice and for his interest in this work. There are 2 tables and 12 references, 6 of which are Soviet.

ASSOCIATION: Kazanskiy gosudarstvenny universitet
(Kazan' State University)

SUBMITTED: November 5, 1959
The Spin-echo Effect Stimulated by Ultrasonic Waves

Quantum-mechanical studies of the spin-echo effect have shown that it is caused by transitions between magnetic levels of material particles, which are due to pulses of a radio-frequency field. As was shown by S. A. Al'tshuler, ultrasonic waves of resonant frequency cause transitions between magnetic levels of material particles. As usual, the sound absorption coefficient is large as compared to the absorption coefficient of the radio-frequency field. Besides, modern emitters can generate sound fluxes of the same order of magnitude as electromagnetic energies which are used for spin-echo observations. All this indicates that an ultrasonic stimulation of the spin-echo effect should be possible. The author of the present paper briefly discusses some formulas for a crystal of cubic symmetry with a nuclear spin I = 3/2.
The Spin-echo Effect Stimulated by Ultrasonic Waves

observable effect can be increased by prolonging the time of spin-spin relaxation, $T_2^*$. As the paper of Ref. 4 shows, this can be brought about by means of a rotating magnetic field (increase by about one order of magnitude). A study of the spin-echo effect stimulated by ultrasonic waves may give information about the relaxation times as well as the sound absorption coefficient, $\sigma$, and the nature of crystal fields. The effect can be observed only in solids, and not in liquids whose sound absorption coefficient is much smaller than that of solids:

$\sigma_{\text{liq}} / \sigma_{\text{sol}} \sim 10^{-6}$. The author thanks S. A. Al'tshuler for discussions, as well as R. A. Dautov and U. G. Konvilev for their advice and their interest in this work. There are 4 references: 1 Soviet, 2 US, and 1 British.

ASSOCIATION: Kazanskiy filial AN SSSR (Kazan' Branch of the AS USSR)

SUBMITTED: January 25, 1960
TEXT: The resonance absorption of ultrasonics in paramagnetics predicted by A. A. Al'bashuly (Ref. 7) was proved experimentally. It has also become possible to measure the probabilities of transitions between sublevels of paramagnetic particles under the action of acoustic vibrations. For this purpose, the ultrasonic pulses were of such a duration that the matter could be assumed to be in a steady state. The present paper gives a theoretical study of the effect stimulated by ultrasonics. In the introduction, the author discusses the effect of ultrasonics on the rotation of the magnetic moment in a constant magnetic field, on the spin, and on the Larmor rotation. The effect of ultrasonics on a spin system (cubic crystal, nuclear quadrupole moment $Q$, nuclear spin $I$, constant...
Action of a Pulsed Acoustic Resonance on a Nuclear Spin System

A field $H_0$ is considered quantum-mechanically in Section 2; the acoustic vibrations of resonance frequency $\omega$ being of duration $t_\omega$. A few relations are derived for a single nucleus with $I > \frac{1}{2}$. Results relating to the time dependence of the average values of some spin components and nuclear quadrupole moments are given in Table 1 for $\Delta m = 1$ and $\Delta m = 2$. The total effect on all nuclei of a sample and a special case ($I = \frac{3}{2}, \omega_1 t_\omega = \omega_2 t_\omega = \pi/2$) are treated in Section 3. The results are finally discussed. Unlike the effect of an electromagnetic field on a spin system, a single acoustic pulse does not induce a free precession signal in the first approximation in $\hbar \omega/kT$. Two acoustic pulses produce a spin echo signal which equals that produced by electromagnetic pulses. The optimum conditions for this are given by $T_2 \omega_{1,2} \gg 1$ (see Ref. 8). The author thanks S. A. Al'tshuler and B. M. Kozharyev for discussions of the results, and R. A. Dautov for advice. There are 2 tables and 15 references: 4 Soviet, 9 US, 1 Japanese, and 1 British.
L 10031-63

SOURCE: RZh. Fizika, Abs. 4D416

AUTHOR: Kessel', A. R.

TITLE: On the theory of pulsed resonance action on the nuclear spin system


TOPIC TAGS: Nuclear magnetic resonance, pulsed, electromagnetic and sound signals

TRANSLATION: Pulsed excitation of a spin system by successive electromagnetic and sound signals is considered theoretically. The Schrödinger equation is used to determine the wave function of the system after eliminating the external generators, and the average values of the components of magnetization are calculated. The connection between the deformations due to the sound wave and the oscillations of the electric quadrupole energy of the nucleus is described phenomenologically by introducing a quadrivalent tensor. In the case of an axial
Crystal in the absence of a constant magnetic field, a single acoustic pulse does not give rise to a signal of free nuclear induction. However, the use of a 2-pulse magnetic-sound technique makes it possible to obtain various oscillating electromagnetic signals, characterizing the dynamic properties of the substance. An investigation of the solution of the Schrödinger equation for an axial crystal placed in a static magnetic field shows that excitation, by means of sound, of transitions in which the magnetic quantum number changes by plus or minus 1 and by plus or minus 2 make it possible to observe free-induction and spin-echo signals. U. Kopvillem

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH
Translation: In a manner similar to that used in the paper of Kubo and Tomita (RZhFiz 1959, no 11, 250-17) for the relaxation function of the magnetic moment, the author calculates the relaxation function of an arbitrary physical quantity in a system subjected to the action of external forces. These results are used to describe the properties of the spin system of a substance in which acoustic oscillations are generated. Expressions are obtained, suitable for the calculation of the coefficient of absorption of sound, the shape of the acoustic resonance line, and of nuclear magnetization stimulated by ultrasound.
KESSEL', A.R.

Theory of the spin echo. Zhur. eksp. i teor. fiz. 41 no. 4:1254-1257 0 '61. (MIRA 14:10)

I. Fiziko-tekhnicheskiy institut Kazanskogo filiala Akademii nauk SSSR.

(Nuclear spin)
24,7000 (II37, II43, II44)

AUTHOR: Kessel', A. R.

TITLE: Classical theory of nuclear acoustic resonance

PERIODICAL: Fizika tverdogo tela, v. 3, no. 11, 1961, 3342-3346

TEXT: Acoustic resonance of nuclei contained in a cubic crystal which is placed in an external constant magnetic field $H_0$ is investigated classically. From a solution of the classical kinetic equation the distribution function of nuclear orientation is determined. It is used to study the characteristics of nuclear spin systems under the influence of acoustic oscillations. In a system of spherical coordinates with the polar axis parallel to $H_0$, nuclear energy is described by

$$\mathcal{H}(t) = \mathcal{H}_0 + h_{\text{ext}}(t), \quad |\mathcal{H}_0| > |h_{\text{ext}}|,$$

where

$$\mathcal{H}_0 = -\hbar \omega_0 \cos \theta, \quad h_{\text{ext}}(t) = \sum \frac{F_j^2 \cos \omega t}{n},$$

$$F_j^2 = \hbar \omega_1 \sin kR f_0(\theta', \varphi'), \quad f_0 = 3 \cos^2 \theta' - 1, \quad f_1 = \sin \theta' \cos \theta'.$$
Classical theory of nuclear...

\[ \omega_1 = \frac{3(7^2 + 1)}{4k(2I_1 - 1)}, \quad X_0 = \cos^2 \theta - \frac{1}{3}, \quad X_1 = 4 \sin \theta \cos \theta \cos \varphi, \quad (1) \]

\[ X_3 = \sin^2 \theta \cos 2\varphi \]

Since it depends on spin orientation, the angles \( \Theta \) and \( \varphi \) of momentum direction, or \( I_x, I_y, I_z \) (\( \hbar I \) is the nuclear momentum) may be taken as generalized coordinates. In doing so:

\[
\begin{align*}
\frac{dL_s}{dt} &= \omega_1 L_s - 2\omega_1 I - I_s \left[ \frac{f_0 + f_1}{2} \right] \sin \theta \cos \varphi, \\
\frac{dL_y}{dt} &= -\omega_1 L_y + 2\omega_1 I - I_s \left[ \frac{f_0 + f_3}{2} \right] \sin \theta \sin \varphi, \\
\frac{dL_z}{dt} &= 4\omega_1 I - I_s \left[ \frac{f_0 + f_2}{2} \right] \cos \theta, \quad \omega_1 = \omega_1 \sin kR.
\end{align*}
\]

is found, a system which is analogous to Bloch's equations but nonlinear and therefore not solvable. \( Q \) denotes the nuclear quadrupole moment \( \gamma \) the gyromagnetic ratio, \( Q \) the axis of symmetry whose direction is determined by \( \Theta^1, \Phi = \theta, 2A \) - amplitude and \( k \) the wave vector of the standing waves, \( R \) the nuclear coordinate, eq. 1 - derivative of electric field gradient with respect to sound-induced relative deformation. The system (2) is used to determine the distribution function \( \Psi(t) = \Psi_0 \left[ 1 + \Psi_1 e^{i\omega t} \right] \). \( \Psi_0 \) is distribution where there are no deformations occur,

\[
\Psi_0 = e^{i\omega t}, \quad c^{-1} = \int^\infty_0 \sin \theta d\varphi, \quad n = \frac{\hbar \omega}{kR} \]

A general solution is found as

\[
\begin{align*}
\Psi(t) &= \Psi_0 \left[ 1 - \frac{n}{\omega} \frac{1}{\sin \theta} \sin \left( \omega_1 t - \frac{1}{3} \right) \right] \\
&\quad + \left[ \omega_1 (\cos^2 \theta + \frac{1}{3} \omega_1 - \omega_1 \cos \theta \cos \varphi) \right] e^{-i\omega_1 t} \\
&\quad + \frac{4 + mp}{4 + p^3} f_1, \quad a_1 = \frac{4 + mp}{4 + p^3}, \quad a_2 = \frac{m}{p} f_0, \quad a_3 = \frac{1 + mp}{1 + p^3} f_3, \quad a_4 = \frac{4 + mp}{1 + p^3} f_1, \quad a_5 = \frac{4 + mp}{1 + p^3} f_1, \\
m = \frac{1}{\omega_0}, \quad n = \frac{\omega_0}{\omega}, \quad p = m + in.
\end{align*}
\]
Classical theory of nuclear...

For $\beta = 0$, $g_0(\nu) = \tau \left[ 2 \tau^2 + 1 \right]^{-1}$, and $\alpha_0$ is the non-resonance sound absorption coefficient of the spin system. The shape of the resonance absorption curve is given by

$$g_0(\nu) = \frac{(\beta^2 \nu^2 + \omega^2)^{-1}}{[1 + (\omega^2 - \nu^2)^{-1}]^2 + 4 \alpha^2 \nu^4}$$


ASSOCIATION: Fiziko-tekhnicheskii institut Kazanskogo filiala AN SSSR (Physicotechnical Institute of Kazan Branch AS USSR)

SUBMITTED: June 1, 1961

Card 5/5

Quantum phonon counter. Fiz. tver. tela 4 no. 8: 2283-2286

Ag '62.

(MIR 15:11)

1. Fiziko-tekhnicheskii institut Kazanskogo filiala AN SSSR. (Electroacoustics) (Quantum theory)
AUTHOR: Kessel', A.R.
TITLE: The effect of motion on acoustic resonance
PERIODICAL: Fizika metallov i metallovedeniya, v.13, no.6, 1962, 801-807

TEXT: It is shown that the statistical method of the quantum theory of irreversible processes put forward by R.J. Kubo (Phys. Soc. Japan, 1957, 12, 570) is convenient for treating acoustic resonance. It is argued that the effect of motion on acoustic resonance should be stronger than on paramagnetic resonance because in AR the electromagnetic fields arise as a result of forced vibrations of magnetic dipoles and electric charges in the substance under investigation, and depend on the motion which is not associated with the sound-waves. Although the Kubo method was used by the author in a previous paper (Izv. Kazanskogo filiala AN, ser. obshchaya, No.1, 1961, p.37) to compute the nuclear magnetization in ionic crystals in the presence of stationary acoustic vibrations, the results of that paper did not fully describe the effect of molecular motion on AR. It is now shown that in determining the form of an AR absorption line it is Card 1/2.
On nuclear acoustic resonance in metals

The author's theory of acoustic resonance (FMM, v.13, no.6, 1962) is used to calculate nuclear acoustic resonance in metals. The absorption coefficients and NAR line profiles are computed for alkali metals. Allowance is made for the thermal motion of the lattice, magnetic dipole interactions between nuclei, nuclear exchange through conduction electrons and the "contact" interactions between electrons and nuclei. Numerical estimates for Na indicate that NAR may be detected in metals with existing experimental techniques. Observations of NAR in metals and analysis of absorption line profiles provide interesting information about internal forces in crystals. For example, line-width ratios may be used to differentiate between magnetic dipole and exchange interactions between nuclei. Consideration of the temperature dependence of line widths leads to the conclusion that the region of temperatures where self-diffusion is inappreciable is most favourable for the observation of NAR in metals. Professor S.A. Al'tshuler is thanked for discussing the results of the work.

ASSOCIATION: Fiziko-tekhnicheskii institut Kazanskogo filiala AN SSSR (Physicotechnical Institute of the Kazan Branch AS USSR)

SUBMITTED: December 11, 1961
TITLE: Statistical theory of acoustical resonance


TRANSLATION: In a manner similar to that used in the paper of Kubo and Tomita (RZhFiz 1959, no 11, 25017) for the relaxation function of the magnetic moment, the author calculates the relaxation function of an arbitrary physical quantity in a system subjected to the action of external forces. These results are used to describe the properties of the spin system of a substance in which acoustic oscillations are generated. Expressions are obtained, suitable for the calculation of the coefficient of absorption of sound, the shape of the acoustic resonance line, and of nuclear magnetization stimulated by ultrasound.
The probability and line shape of magneto-acoustic two-quantum transitions (cf. N. S. Shiren, Phys. Rev. Lett., 6, 168, 1961) are calculated on the basis of approximate linear theory of irreversible processes. Such a theory is applicable when the actions of the two external fields are weak enough to be replaceable by one effective field. The two-quantum transition probability is calculated for the discrete spectrum of a system of N identical noninteracting particles with spin $S$, whose Hamiltonian is

$$\mathcal{H}_0 = \sum_{j=1}^N p_j \mathcal{H}_j.$$ The result is

$$\mathbb{W}_{13} = \frac{1}{16\hbar^2} \sum_{n,m} \left| \langle \mathcal{H}_j \rangle_n \right|^2 \left| \langle \mathcal{H}_k \rangle_m \right|^2 \langle \omega \rho_{nm} \rangle^{-1} \left| \langle \mathcal{H}_l \rangle_n \right|^2 \left| \langle \mathcal{H}_m \rangle_m \right|^2 \times \right.$$  

$$\times (\omega - \omega_m)^{-1} - 2 \Re \left( \langle \mathcal{H}_j \rangle_n \langle \mathcal{H}_l \rangle_m \langle \mathcal{H}_k \rangle_n \langle \mathcal{H}_m \rangle_m \right) \times$$

$$\times \left( (\omega - \omega_m) (\omega - \omega_m) \right)^{-1} \left( \delta (\omega - \omega_m, \omega_m, \omega_m) + \delta (\omega - \omega_m, \omega_m, \omega_m) \right) \times$$

$$+ \delta (\omega - \omega_m, \omega_m, \omega_m) + 2 \delta (\omega - \omega_m, \omega_m, \omega_m) \delta (\omega - \omega_m, \omega_m, \omega_m) \right).$$

Card 1/3
Theory of two-quantum ...

\[ W_{1 \rightarrow 2} = \lim_{t \rightarrow 0} \frac{1}{t} W_{1 \rightarrow 2}(t). \]

\[ W_{1 \rightarrow 3}(t) = [\mathcal{L}_3(t)]^2. \]

\( \mathcal{L}_3(t) \) is the evolution operator (R. P. Feynman, Phys. Rev. 84, 108, 1951).

The transition between the levels \( E_1 \) and \( E_2 \) \((E_1 < E_2)\) takes place under the action of the field \( H(t) = H_1 \cos \omega_0 t \) and the acoustic deformations \( \xi(t) = \xi_0 \cos \omega_0 t \).

\( E_a \) and \( E_1 \) are intermediate levels, \( \delta(\nu) \) Dirac's delta function and \( \delta_{\nu,0} \) the Kronecker symbol. If the line width is taken into account, the \( \delta(\nu) \) functions in (7) have to be replaced by the form factor \( g(\nu) \).


\[ P(\omega) = \sum_{\nu} \frac{\langle k(\omega, \nu) \rangle^2}{4E(\omega, \nu)} \left( 1 - \sum_{\nu' \neq \nu} \frac{s_{\nu'}^2}{s_{\nu}^2} \right) \frac{1}{2\pi \omega \nu} \exp \left( - \frac{\omega - \omega_0 + \sum_{\nu' \neq \nu} s_{\nu'}^2}{s_{\nu}^2} \right) + \sum_{\nu} \sum_{\nu' \neq \nu} \frac{\langle k(\omega, \nu) \rangle^2}{4E(\omega, \nu)} \frac{s_{\nu'}^2}{s_{\nu}^2} \delta(\omega - \omega_0 - \omega) \]

\[ s_{\nu}^2 = \frac{\langle \langle [k(\omega, \nu), \mathcal{X}'(\omega)] [\mathcal{X}'(\omega), k(-\omega)] \rangle \rangle}{\mathcal{M} \langle \langle k(\omega, \nu) \rangle \rangle}. \]
The region of applicability of the system of Bloch equations in paramagnetic resonance is bounded by two factors: (1) They may be obtained by expanding spin-spin and spin-lattice interactions into a series with respect to the energy; in the case of solids this expansion is generally insufficient. (2) When this expansion is possible the following additional conditions have to be satisfied: the particle spectra have to be equivalent; \( \omega_o \ll kT \), where \( \omega_o \) is the resonance frequency for \( S > 1/2 \); the contribution of the quadrupole interactions to the line width (for \( S > 1 \)) should be negligible. Since the Bloch system does not describe quadrupole and acoustic resonances it is applicable without restriction only for \( S = 1 \). Here a method is proposed that allows of dropping the conditions (2). For arbitrary \( S > 1/2 \) a system of \( n \ll 4S(S+1) \) linear differential equations are derived which generalize the Bloch system. Similar generalizations may be...
obtained by any other way of taking the internal interactions G into account. The possibility of observing quadrupole induction is pointed out, i.e. it is possible to measure the alternating electric field of resonance frequency which is generated by the precession of the electrical quadrupole moment of the electron shell of the paramagnetic atoms participating in paramagnetic resonance.

ASSOCIATION: Fiziko-teknicheskii institut Kazanskogo filiala AN SSSR (Physicotechnical Institute of the Kazan' Branch AS USSR)

SUBMITTED: October 26, 1962
AUTHOR: Kessel', A. R. and Morocha, A. K.

TITLE: The effect of the electric quadrupole induction during the electron resonance

PERIODICAL: Zhurnal eksperimental'noy i tekhnicheskoy fiziki, v. 44, no 3, 1965, 113-115

TEXT: Whenever the resonant magnetic field causes transitions between levels where magnetism is not entirely due to spin, the motion of the orbital magnetic moment is accompanied by changes in the distribution of the electron charge. In particular, the motion of the electrical quadrupole moment of the electron shell induces a magnetic field which can be measured (A. R. Kessel', Ref. 1: FTT, 5, 1055, 1955). In this letter the authors investigate the various possible signals and present formulas giving their respective amplitudes. There is 1 figure and 1 table.

ASSOCIATION: Fiziko-tekhničeskij institut Kazanskogo filiala Akademii nauk SSSR (Physico-Technical Institute of the Kazan' Section of the AS USSR)

SUBMITTED: December 12, 1962
The authors use group theory to introduce equations such as the Bloch function for effective spin. Previous works have employed a great number of equations, but the authors show that this number may be greatly reduced by employing the symmetry of the problem and by introducing effective spin. They illustrate the method with the rare earths, examining all cases of practical importance. They have found solutions to the equations and have obtained general expressions for relaxation time, including all possible mechanisms of interaction between ions and their environment. They show that after two impulses there occurs a separation, with time, of signal echoes from magnetic dipole induction and electrical quadrupole induction. There is possibly also a separation according to frequency. Orig. art. has 15 formulas.

Effect of electric dipole induction in electron resonance. Fiz. tver. tela 5 no.8:2364-2365 Ag '63. (HIRA 1619)

1. Fiziko-tekhnicheskiy institut AN SSSR, Kazan'.
   (Dipole moments)
   (Paramagnetic resonance and relaxation)