

L 12808-63

ACCESSION NR: AP3000762

exclusively. If space groups do not refer to such a category, then dipole and nondipole structures are uniquely determined if the position of the constituents in the unit cell are known in relation to the symmetry elements. "The author thanks V. A. Koptsik for his discussions and valuable remarks."

ASSOCIATION: Institut kristallografi AN SSSR (Institute of Crystallography, AN SSSR); Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 20Jul62

DATE ACQ: 21Jun63

ENCL: 00

SUB CODE: PH

NO REF SOV: 006

OTHER: 001

Card 2/2

L 12806-63 EWT(L)/EMP(q)/EMT(m)/BDS/ES(s)-2 AFFTC/ASD/SSD Pt-4 CG/LJP(C)/JD  
ACCESSION NR: AP3000764 S/0070/63/008/003/0328/0332 73  
63

AUTHOR: Zheludev, I. S.; Lyubimov, V. N.

TITLE: Features of structural changes during phase transitions in antiferroelectric materials

SOURCE: Kristallografiya, v. 8, no. 3, 1963, 328-332

TOPIC TAGS: antiferroelectric, ferroelectric, ferrielectric, superlattice, domain structure, ammonium dihydrophosphate, lead zirconate, lead hafnate, sodium niobate, tungsten oxide, hydrous ammonium iodate, hydrous silver iodate

ABSTRACT: The authors examine the crystallographic pattern that appears in the development of superlattice unit cells and in the formation of domain structures during antiferroelectric phase transitions. Their analysis is based on consideration of published data relative to phase transitions, and they find that differences between structures here considered (antiferroelectric, ferroelectric, and ferrielectric) are commonly associated simply with differences in type of twinning that develops during phase transition. They note also that disturbance in crystal structures during phase transition may be associated with growth of domain structure. Data on lead zirconate indicate that structural analysis permits only a partial explanation of the general structural picture of low-temperature transitions. The

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ACCESSION NR: AP3000764

entire picture, with due consideration of domain structure and of different associations, must be the same as for paraelectric materials. This makes it possible to state why a number of crystals with good dielectric properties have superlattice structures. These crystals include lead titanate, lead hafnate, sodium niobate, tungsten oxide, hydrous ammonium iodate, hydrous silver iodate, and numerous solid solutions. The authors conclude that it is necessary to make parallel investigations of macrostructures and microstructures of crystals having special properties if one is to make a complete explanation of the nature of their phase transitions. Orig. art. has: 3 figures.

ASSOCIATION: Institut kristallografi AN SSSR (Institute of Crystallography AN SSSR); Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 20Jul62

DATE ACQ: 21Jun63

ENCL: 00

SUB CODE: PH

NO REF SOV: 007

OTHER: 004

Card 2/2

LYUBIMOV, V.N.

Spatial symmetry of electric and magnetic dipole structures.  
Kristallografiia 8 no.6:674-706 (1974), (MIRA 10:10)

1. Fiziko-khimicheskiy institut, Ural'skiy nauchnyy tsentr, Sverdlovsk.

LYUBIMOV, V. N.

"The Calculations of the internal electric fields and electric-field gradients in the perovskite-type compounds with special dielectric properties."

report presented at the Symposium on Phase Transitions in Solids, 6th General Assembly, Intl. Union of Crystallography, Rome, Italy, 16-18 Sep 1963.

(Karpov Institute of Physical Chemistry, Moscow, USSR)

LYUBIMOV, V. N.

4

VENEVITSEV, Yu. N., LYUBIMOV, V. N. , SOLOV'YEV, S. P., Viskov, A. S. and ZHDANOV, G. S.

"Calculation of Internal Electric Fields and Field Gradients in Perovskite Type Compounds with Special Dielectric Properties."

report presented at the Symposium on Ferroelectricity and Ferromagnetism, Leningrad, 30 May - 5 June 1963.

SOLOVYEV, S. P.; LYUBIMOV, V. N.; VENEVTSEV, Yu. N.; ZHDANOV, G. S.

"The calculations of the internal electric fields and electric-field gradients in the perovskite-type compounds with special dielectric properties.

report submitted for 6th Gen Assembly, Intl Union of Crystallography, Rome, 9 Sep 63.

Karpov Inst of Physical Chemistry, Moscow.

SAVITSKIY, Ye.M.; KEYS, N.V.; POPOV, V.F.; LYUBIMOV, V.N.; ZHUKOV, D.G.

Properties of Kh18Ni2M2t stainless steel containing rare-earth  
metal oxides. Metalloved. i term. obr. met. no.8:33-38 Ag '63.  
(MIRA 16:10)

1. Institut metallurgii im. Baykova i Chelyabinskiy  
metallurgicheskiy zavod.



LYUBIMOV, V.N.; ZHELUDEV, I.S.

Dipole and nondipole crystalline structures. Kristallografiia  
8 no.3:313-318 My-Je '63. (MIRA 16:11)

1. Institut kristallografii AN SSSR i fiziko-khimicheskiy in-  
stitut imeni L.Ya. Karpova.

ZHELJDEV, I.S.; LYUBIMOV, V.N.

Characteristic structural changes in phase transitions in  
antiferroelectric substances. Kristallografiia 8 no.3:328-  
332 My-Je '6e. (MIRA 16:11)

1. Institut kristallografii AN SSSR i fiziko-khimicheskii in-  
stitut imeni L.Ya.Karpova.

ACCESSION-NR: AP4030633

S/0048/64/028/004/0626/0629

AUTHOR: Lyubimov, V.N.

TITLE: Contribution to the phenomenological theory of electric and magnetic structures. Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1963/7

SOURCE: AN SSSR. Izv.Ser.fiz., v .28, no.4, 1964, 626-629

TOPIC TAGS: ferroelectricity, ferromagnetism, ferroelectromagnetism, phenomenological ferroelectromagnetism theory

ABSTRACT: A phenomenological theory of combined ferroelectric and ferromagnetic phenomena is constructed in analogy with the Weiss theory of ferromagnetism. The molecular magnetic field is assumed to be the sum of the magnetic field and a term proportional to the magnetization, as in Weiss' theory, and an additional interaction term proportional to the electric polarization. Similarly, the molecular electric field is the sum of the electric field, the Lorentz term proportional to the polarization, and an interaction term proportional to the magnetization. The coefficient of the magnetization in the expression for the molecular electric field is

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ACCESSION NR: AP4030633

equal to that of the polarization in the expression for the molecular magnetic field. This addition to polar and axial vectors is justified by a footnote to the effect that it should be valid at least for those crystallographic classes that do not admit of reflection or time reversal as symmetry operations. By calculations that are presumably identical to those of Langevin and Weiss, expressions were derived for the transition temperatures, the three susceptibilities (magnetic, electric and mixed), and the spontaneous polarization and magnetization. These expressions reduce to those of Weiss' theory when electrical effects are absent, and to those obtained by W. Mason in his theory of Rochelle salt (Phys.Rev.72,854,1947) when magnetic effects are absent. Various interaction effects occur. For example, if the electric transition temperature is greater than the magnetic transition temperature, a weak spontaneous magnetization appears at intermediate temperatures. A Hamiltonian is written for a double lattice having magnetic dipoles at half the sites and capable of electric polarization at the remaining sites. This Hamiltonian contains Ising's term for the interaction energy of the magnetic dipoles, an analogous term for that of the electric dipoles, a term for the interaction energy of the electric with the magnetic dipoles, and an elastic energy term that limits the electric polarizability. An approximate partition function was derived from this Hamiltonian by Bogolyu-

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ACCESSION NR: AP4030633

bov's statistical variational principle, and expressions are deduced for the parameters of the phenomenological theory in terms of those appearing in the Hamiltonian. "I convey my deep gratitude to V.V.Tolmachev for his guidance and constant interest in the work." Orig.art.has: 20 formulas

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 30Apr64

ENCL: 00

SUB CODE: EM

NR REF SOV: 005

OTHER: 003

Card 3/3

ACCESSION NR: AP4030634

S/0048/64/028/004/0630/0635

AUTHOR: Venevtsev, Yu.N.; Lyubimov, V.N.; Solov'yev, S.P.; Zhdanov, G.S.

TITLE: Calculation of the internal electric fields and their gradients in perovskite compounds with distinctive dielectric properties [Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1962]

SOURCE: AN SSSR. Izv.Ser.fiz., v.28, no.4, 1964, 630-635

TOPIC TAGS: internal field , crystal internal field , perovskite structure, ferroelectricity, ionic ferroelectricity model, ferroelectric compound

ABSTRACT: For a number of years the authors have been engaged in calculating the internal electric fields in compounds having the perovskite structure and peculiar dielectric properties. The methods of calculation and the results have been reported in a series of papers appearing in Kristallografiya (Crystallography) and Fizika tverdogo tela (Solid State Physics) from 1958 to 1962. The results of these calculations are discussed in the present paper. The calculations were based on the ionic model of a crystal with known or assumed structure. The charges and polarizabilities of the point ions were treated as given quantities, but the induced dipole moments

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ACCESSION NR: AP4030634

were calculated. Calculations were performed for several values of the charge, polarizability, and radius of the ions; reasonable variations of these parameters did not alter the qualitative picture of the fields in the six compounds investigated (lead, barium, calcium and cadmium titanates, sodium tantalate, and lead zirconate). Good agreement was obtained between observed and calculated values of the spontaneous polarization with the value 0.5 for the ionic charge factor. The results of the calculations indicate that  $\text{NaTaO}_3$  and  $\text{CdTiO}_3$  are ferrielectric materials and that  $\text{PbZrO}_3$  is a ferrielectric material with nearly antiferroelectric properties. The internal field at the position of the Ti ion was found to vanish in  $\text{CaTiO}_3$  but to be large in  $\text{BaTiO}_3$  and  $\text{PbTiO}_3$ . This difference in the fields accounts for the different dielectric behavior of these materials. Because of the strong field at the Ti ion, the conclusion of H.D. Megaw (Acta crystallogr., 5, 739, 1952; Ibid., 7, 187, 1954) that the principal factor in ferroelectric transitions of  $\text{ABO}_3$  type materials must be a sharp increase in the covalent character of the B-O bond is regarded as inadequately grounded. It is concluded that further theoretical and experimental investigation of the possibilities of the ionic model is desirable, and improved calculations of field gradients are promised for the near future. Orig.art.has: 1 table.

Card 2/3

LYUBIMOV, V. N.

Spatial symmetry of electric and magnetic dipole structures.  
Izv. AN SSSR. Ser. fiz. 28 no. 4:658-659 Ap '64. (MIRA 17:5)



LYUBIMOV, V.N.

Symmetry of multipolar lattices. Kristallografiia 10 no.3:  
405-407 My-Je '65. (MIRA 13:7)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova.

I 61800-65 EWT(1)/T LSP(c) - 60

ACCESSION NR: AP5018720

UR/0070/65/010/004/0520/0524

AUTHOR: Lyubimov, V. N.

42

27

3

TITLE: Interaction of the polarization and magnetization in crystals

SOURCE: Kristallografiya, v. 10, no. 4, 1965, 520-<sup>5</sup>624

21,44,

TOPIC TAGS: ferroelectric property, ferromagnetic property, crystal symmetry, crystal structure, phase transition, electric polarization, magnetization

ABSTRACT: The change in the magnetic symmetry is investigated for phase transitions to the ferroelectro-magnetic state, using as an example the cubic  $m\bar{3}m$   $I$  group to which the nonpolarized perovskite type  $ABO_3$  structure belongs. The crystallographic conditions for the existence of the piezomagnetolectric effect are investigated and group theory is used to determine the number of independent constants describing its tensor in the magnetic-symmetry classes. A center of

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L 61800-65

ACCESSION NR: AP5018720

15

symmetry and the  $\perp$  operation are found to be the only limitations from the point of view of symmetry which prohibit the existence of the piezomagnetolectric effect. Hence all 13 ferroelectro-magnetic classes permit this effect. In all this effect is possible in 69 magnetic crystallographic groups and 10 limiting groups. Simultaneous absence of a center of symmetry and of the  $\perp$  operation is a necessary and sufficient condition for the possibility of the existence of the effect. "I express my deep gratitude to V. V. Tolmachev, Yu. N. Venyutsev, I. S. Zheludev, and V. A. Kcptsik for useful discussions of the problems considered above." Orig. art. has: 8 formulas and 2 tables.

ASSOCIATION: Fiziko-khemicheskiy institut im. L. Ya. Karpova  
(Physicochemical Institute)

SUBMITTED: 04Aug64

ENCL: 00

SUB CODE: SS

NR REF SOV: 017

OTHER: 004

Card

281  
2/2

L 57033-52 EWT(1)/EPA(s)-2/EWT(m)/EED(s) Pt=1/E1-A IJF(c) JD/JW/GG  
ACCESSION NR: AP5016110 UR/0048/65/029/006/0887/0889

AUTHOR: Lyubimov, V.N.; Tolmachev, V.V.

43  
42  
B

TITLE: Contribution to the theory of dipole structure (Report, 4th  
All-Union Conf. on Ferroelectricity held in Rostov-on-the-Don 12-18  
Sept 1964/

SOURCE: AN SSSR.Izvestiya. Ser.fizicheskaya, v.29, no.6, 1965, 887-889

TOPIC TAGS: ferroelectricity, ferromagnetism, dipole interaction,  
statistical thermodynamics, many body problem

ABSTRACT: One of the authors has discussed a dipole structure con-  
sisting of two sublattices with the aid of Bogolyubov's statistical  
variational principle (V.N.Lyubimov, Izv.AN SSSR.Ser.fiz.28, 626, 1964).  
In the present paper this treatment is extended to the case of three  
sublattices of which two can be polarized along one axis and the  
third along an axis perpendicular thereto. A number of results pre-  
viously obtained otherwise by various authors are derived in a simple  
and unified way. These include the formula of A.F.Devonshire (Adv.

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L 57033-65

ACCESSION NR: AP5016110

Phys.3,85,1954) for the polarization in the anharmonic oscillator model. It is shown how expressions in terms of molecular quantities can be derived for the phenomenological parameters of W.Mason's thermodynamic theory of ferroelectricity. The present method makes it possible to include the effects of short-range order. It is found that when these effects are included the heat capacity does not drop to zero at the right of the transition point but remains finite and temperature dependent. It is concluded that the many-body approach enables one simply to derive results of various theories of dipole structures and, moreover, to construct theories for dipole structures for which theories have not previously been available. Orig.art.has: 15 formulas.

ASSOCIATION: Fiziko-khemieskiy institut im.L.Ya.Karpova (Physico-chemical Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: SS,EM

NR REF SOV: 006

OTHER: 004

30  
Card 2/2

L 15194-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ESD(gs) MJW/JD/JG/WB/MLK  
ACCESSION NR: AT4048716 S/0000/64/000/000/0214/0217

AUTHOR: Savitskiy, Ye. M. (Professor, Doctor of chemical sciences), Popov, V. F.,  
Keys, N. V., Lyubimov, V. N. <sup>13</sup>

TITLE: The effect of rare earth metals and their oxides on the plasticity and anti-  
corrosive properties of stainless steels. <sup>6</sup>

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. Voprosy\*  
teorii i primeneniya redkozemel'nykh metallov (Problems in the theory and use of rare-  
earth metals); materialy\* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 214-217

TOPIC TAGS: rare earth metal, rare earth oxide, steel plasticity, steel corrosion  
resistance, steel macrostructure, steel mechanical property, austenite grain, grain  
boundary

ABSTRACT: Improvement of the stainless steels Kh18N12M2T and 1Kh18N9T, whose  
ingots had been marred by surface blisters and eddies, was sought by the addition of  
0.05-0.18% rare earth metals (REM) or 0.08-0.12% REM oxides (polyrite) under manu-  
facturing conditions (described). The REM oxides were added into the ladle at tempera-  
tures of 1540-1570C; the metal remained in the ladle for 10-15 minutes before being  
poured. Test specimens were evaluated for macrostructure, the content of alpha phase,

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L 15194-65

ACCESSION NR: AT4048716

corrosion resistance and mechanical properties; plasticity was determined by the torsion test at high temperatures, the size of the austenite grains was determined microscopically. The additions were found to have a favorable effect on the technological properties of the 2 steels, resulting in an improved ingot surface due to better steel flowability, improved toughness, and disappearance of gross fissures at corners and planes of the bars, which reduced cleaning expenditure by 30-40%. Both the macrostructure and corrosion resistance improved, due to purification at the grain boundaries. Strength and plasticity increased while the anisotropy of the mechanical properties decreased. In the torsion tests at 1200C, the number of rotations required for breaking increased from 10 to 24 and from 13 to 23, respectively. The addition of REM oxides rather than the pure metal or a metal mixture affords considerable savings in the modifier cost. The austenite grain was smaller in the Kh18N12M2T steel after oxide addition. The optimal additions found under these experimental conditions are given. Orig. art. has: 1 table and 1 figure.

ASSOCIATION: None

SUBMITTED: 13Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 008

OTHER: 001

Card 2/2

SAVITSKIY, Ye.M.; KEYS, N.V.; POPOV, V.F.; LYUBIMOV, V.N.; ZHUKOV, D.G.;  
MALINOVSKAYA, T.I.

Effect of rare-earth metals on the properties of stainless steel.  
Izv. AN SSSR. Otd. tekhn. nauk. Met. i gor. delo no. 1:133-137 Ja-F '63.  
(MIRA 16:3)

(Steel, Stainless—Metallurgy)

(Rare earth metals)



L 14956-63 EWP(a)/EWT(m)/BDS AFFTC/ASD JD/JG  
ACCESSION NR: AP3004786 8/0129/63/000/008/0033/0038

AUTHOR: Savitskiy, Ye. M.; Keys, N. V.; Popov, V. F.; Lyubimov, V. N.; Zhukov, D. G.

TITLE: Properties of Kh18Ni2M2F stainless steel containing oxides of rare-earth metals

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 8, 1963, 33-38

TOPIC TAGS: Kh18Ni2M2F stainless steel, AISI 316F steel, rare-earth metal oxide addition, optimum amount, steel tensile strength, room-temperature ductility, hot ductility, formability microstructure

ABSTRACT: The effect of 0.08 and 0.12% additions of rare-earth metal (REM) oxides on properties of Kh18Ni2M2F [AISI 316F] stainless steel has been investigated in three production-scale heats. The oxides were put in a 40-ton preheated ladle 5-8 min before tapping the furnace and casting the steel into 4.5-ton ingots. Test specimens were cut from the top, middle, and bottom sections of the ingots. Ductility characteristics of rolled metal were measured both along and across the direction of rolling. Steel ingots with REM oxides were found to have a

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L 14956-63  
ACCESSION NR: AP3004786

dense flawless surface requiring only slight surface conditioning and a fine dense macrostructure without traces of segregation. Rolled blooms also had no surface defects. The amount of ferrite in REM-oxide-treated steel was 50 to 75% smaller than in untreated steel, and its distribution along the ingot height was more uniform. Addition of REM oxides improved steel formability and resistance to intercrystalline corrosion and increased the yield by about 0.5%. An addition of 0.08% REM oxides increased the room-temperature tensile strength by 11.5% and the yield strength by 15.4%; no further improvement was observed when the REM oxide content was raised to 0.12%. While the hot ductility of the steel without REM oxides gradually improved as the test temperature increased to 1000 and 1200C, it increased by 1.5-2 times with an addition of 0.08% of REM oxides. In hot ductility torsion tests, steel specimens with 0.08% REM oxides withstood 18 and 28 turns at 1000 and 1200C, respectively, while specimens of untreated steel failed after 8-10 and 12-15 turns. The REM-oxide-treated steel also had a finer austenite grain, lower anisotropy of the mechanical properties, and higher ductility, particularly across the direction of rolling. In general, addition of REM oxides is especially effective in casting large ingots and shaped castings. Orig. art. has: 5 tables.

ASSOCIATION: Inst. of Metallurgy Chelyabinsk Metallurgical Plant

Card 2/52

L 1068-66 EWT(1)/EWA(m)-2 IJP(c) AT

ACC NR: AT6001394

SOURCE CODE: UR/3180/64/009/000/0116/0120

AUTHOR: Vanyukov, M. P. (Candidate of physico-mathematical sciences); Isayenko, V. I.; Lyubimov, V. V.

ORG: none

27  
BT1

TITLE: Spatial instability of the luminous element of high-pressure pulse lamps operating under repeated flash conditions

SOURCE: AN SSSR. Komissiya po nauchnoy fotografii i kinematografii. Uspekhi nauchnoy fotografii, v. 9, 1964. Vysokoskorostnaya fotografiya i kinematografiya (High-speed photography and cinematography), 116-120

TOPIC TAGS: flash lamp, spark gap, electric discharge

21  
ABSTRACT: A photoelectric method was developed for measuring the probability distribution of the position of spark discharge channels in space when the gap is cut in under repeated discharge conditions. The spatial distribution of the channels depends on the shape of the electrodes. The width of the distribution is 0.35 mm for conical electrodes and increases to 1-2 mm for electrodes in the shape of a hemisphere or frustum of a cone. The widths of channel distribution in ISSh-type high-pressure pulse lamps range from 0.5 to 1.5 mm. Methods are described for improving the spatial stability of the channel by introducing two auxiliary electrodes into the

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L 11068-66

ACC NR: AT6001394

0

spark gap when the gap is flushed with a stream of gas having a low breakdown capacity and when a surface discharge on a ceramic surface is used. Orig. art. has: 6 figures, 1 table.

SUB CODE: 20,13 SUBM DATE: 00/ ORIG REF: 000/ OTH REF: 002

Card <sup>m</sup> 2/2

KONTORSHCHIKOV, P.V.; KARACHEV, A.S.; LYUBIMOV, V.P.

Study of power consumed in core drilling of geological exploratory wells. Razved. i okh. nedr 23 no.4:34-41 Ap '57. (MIRA 11:1)

1. Sverdlovskiy gornyy institut imeni V.V. Vakhrushева.  
(Boring)

BLINOV, N.I., prof.; KONTORSHCHIKOV, P.V., starshiy prepodavatel';  
LYUBIMOV, V.P., dots.; SALAMATOV, M.A., assistant; VERSHININ, Yu.I.,  
assistant

Increasing the durability of shot boring bits. Izv.vys.ucheb.zav.;  
gor.zhur. no.4:57-66 '58. (MIRA 11:11)

1. Sverdlovskiy gornyy institut.  
(Boring machinery)

SOV 132-58-12-4/14

AUTHORS: Blinov, N.I., Kontorshchikov, P.V., Lyubimov, V.P., Solomatov, M.A. and Vershinin, Yu I.

TITLE: To Increase the Durability of Shot Boring Bits (Povysheniye stoykosti drobovykh koronok)

PERIODICAL: Razvedka i okhrana nedr, 1958, <sup>№</sup> Nr 12, pp 24-31 (USSR)

ABSTRACT: The Sverdlovsk Mining Institute conducted extensive tests with different shot boring bits to establish the main factors which increase the resistance to wear of the bits under different geological conditions. These factors are: 1) the influence of the hardness of shot boring bits on the drilling speed, 2) the influence of the chemical composition of these bits on their resistance to wear and on the drilling speed; and 3) the influence of the shape of the bits on their resistance to wear and on the drilling speed (See Graphics 1 to 7). The following conclusions were reached: 1) in the drilling of bore holes with tempered steel shots, the boring bits must have vertical rectangular indentations. They are most simple to manufacture, maintain constant pressure on the rock and increase drilling speed; 2) the drilling speed depends on the shape of the indentation, its width and height

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To Increase the Durability of Shot Boring Bits

SOV/132-58 12-4/14

and also on the thickness of the walls and the hardness of the metal of the bit. Bits with a rectangular indentation and with 10 - 12 mm thick walls give the best results. 3) the basic parameters of the bit must be as follows: a) a rectangular 150 - 200 mm high and 1/4 - 1/8" D wide indentation; b) the walls of the bit must be 10 - 12 mm thick; c) the total height of the bit must be 250 - 300 mm; 4) the shot boring bits must be made from steel of the brands U12S, 30KhG3, 40Kh and 45, tempered for a metal strength of 25 - 30 HRC.

There are 7 graphs, 1 table and 10 Soviet references.

ASSOCIATION: The Sverdlovskiy gornyy institut (The Sverdlovsk Mining Institute)

Card 2/2





AL'BENSKIY, A.V.; VASIL'YEV, M.Ye.; KONDRAKOV, B.V.; KONDRAT'YEV, M.S.;  
TARASENKO, A.N.; ZAKHAROV, B.S.; LYUBINOV, V.I.

This is what scientists say about shelterbelts. English  
27 no.10:24-27 O 1955. (MIRA 18-19)

1. Direktor Vsesoyuznogo nauchno-issledovatel'skogo instituta  
agrolesomelioratsii. (Chief-korrespondent Vsesoyuznoy akademii  
sel'skokhozyaystvennykh nauk imeni Lenina (for Al'benskiy).
2. Melnogradskiy sel'skokhozyaystvennyy institut (for  
Vasil'yev).
3. Direktor Iovolzhskoy agrolesomeliorativnoy  
opytnoy stantsii (for Kondrakov).
4. Kraenoyarskiy sel'skokhozyaystvennyy institut (for Kondrat'yev, Tarasenko).
5. Novoshekerkaskiy nauchno-issledovatel'skiy institut (for  
Zakharov, Lyubimov).

ANISTRATOV, Yu.I., gornyy inzh.; IL'IN, S.A., gornyy inzh.; LYUBIMOV, V.S.,  
gornyy inzh.

Width of a juu when truck haulage is used. Gor. zhur. no.3:38-39  
Mr '62. (MIRA 15:7)

1. Moskovskiy gornyy insitut.  
(Strip mining)

L 10078-63 EWA(k)/EWT(1)/ENF(a)/FDD/BDS/T-2/3W2/EEG(b)-2/ES(t)-2--  
AFFTC/ASD/ESD-3/RADC/AFGC/AFWL/SSD--P1-l/Pc-l--GG/JHB/WH/WG/IJP(C)/K/EH  
ACCESSION NR: AP3000594 S/0051/63/014/005/0734/0736

AUTHOR: Vanyukov, M. P.; Isayenko, V. I.; Lyubimov, V. V. 86

TITLE: Time variation of the spectral composition<sup>21</sup> of the emission of the  
ruby laser<sup>25</sup>

SOURCE: Optika i spektroskopiya, v. 14, no. 5, 1963, 734-736

TOPIC TAGS: ruby laser emission, ruby laser spectrum

TEXT: Time-sequence photographs of the emission line spectrum of the ruby laser have been obtained. The spectral lines were separated by a Fabry-Perot interferometer and detected by an electron-optical image converter. Various ruby samples were used in the laser, and the interferometer base was varied from 4 to 25 mm. The pumping energy of the laser was also varied. Photographs show that the energy of the laser pulse can consist of one, two, or three lines and that emission wavelength can vary from

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L 10078-63

ACCESSION NR: AP3000594

pulse to pulse within an interval of 0.2 Angstrom, with no apparent regularity. The results coincide with those obtained by Hughes and by McMurtry and Siegan. Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 20Oct62

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: 00

NO REF SOV: 000

OTHER: 005

*bm/26*  
Card 2/2

AID Nr. 984-5  
Lyubimov, V.V.  
6 June

## TIME VARIATION OF SPECTRAL COMPOSITION OF Nd-DOPED GLASS LASER OUTPUT (USSR)

Vanyukov, M. P., V. I. Isayenko, and V. V. Lyubimov. Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 4, Apr 1963, 1151-1152  
S/056/63/044/004/006/044

The variation of the spectral composition of the output of a neodymium-doped glass laser with time is investigated. A glass cylinder 60 mm long and 8 mm in diameter containing 2% Nd<sub>2</sub>O<sub>3</sub> was used. A spectral dispersion of 14 Å/mm was accomplished by a diffraction spectrograph, and the time variation was registered by an electron-optical converter. The time resolution was ~15 sec. The results, with superthreshold pumping powers of a) 20%, b) 40%, and c) 70%, are shown in the illustration. The simultaneous production of several lines with superthreshold pumping power is explained as due to the establishment of population inversion for several pairs of sublevels at the same time.

Card 1/2

AED Nr. 984-5 6 June

TIME VARIATION OF SPECTRAL COMPOSITION [Cont'd]

S/056/63/044/004/006/044



Card 2/2

[BB]

L 1381-66 EWP(e)/EWT(m)/EWP(i)/EWP(t)/EWP(b) IJP(c) JD/JG/WH

ACCESSION NR: AP5021491

UR/0368/65/003/002/0171/0172  
535.89

AUTHOR: Vanyukov, M. P.; Isayenko, V. I.; Lyubimov, V. V.

57  
B

TITLE: Polarization of the stimulated radiation of neodymium-activated glass

15.44

SOURCE: Zhurnal prikladnoy spektroskopii, v. 3, no. 2, 1965, 171-172

TOPIC TAGS: light polarization, polarized light, polarization, stimulated radiation, resonator, laser, neodymium doped glass, glass, neodymium

17

ABSTRACT: The high losses caused by the polarizer can be avoided by using instead a glass plate whose angle to the axis of the instrument can be varied. The glass plate, which is placed between the neodymium glass rod and the output window, affects the efficiency of the resonator by determining the polarization plane of light oscillations. During experiments, the emerging beam was split by a half-transparent mirror, and the intensity of the two components was compared on a two-channel oscillograph. The measurements showed that if the glass plate is inclined at a small angle to the axis of the resonator, an almost complete polarization of the stimulated radiation can be obtained without involving great losses of energy. Orig. art. has: 2 figures.

[ZL]

Card 1/2



L 1381-66

ACCESSION NR: AP5021491

ASSOCIATION: none

SUBMITTED: 12Jan65

NO REF SOV: 001

ENCL: 00

OTHER: 001

SUB CODE: EM, OP

ATD PRESS: 4099

Card <sup>KE</sup> 2/2

L 63382-65 EWA(k)/PBD/EWT(1)/ENP(e)/EWT(m)/EEC(k)-2/ENP(1)/T/EP(k)/ENP(b)/  
 EWA(m)-2/EWA(h) SCTB/LJP(c) WG/WH

ACCESSION NR: AP5019765

UR/0051/65/019/002/0286/0287  
 621.375.9:535

AUTHOR: Vanyukov, M. P.<sup>44</sup>; Isayenko, V. I.<sup>44</sup>; Kalinin, V. P.<sup>44</sup>; Lyubimov, V. V.<sup>44</sup> 44 B

TITLE: Effect of mirror misalignment of a Fabry-Perot resonator on the resonator loss

SOURCE: Optika i spektroskopiya, v. 19, no. 2, 1965, 286-287

TOPIC TAGS: solid state laser, neodymium laser, Fabry Perot resonator, resonator loss, laser optics

ABSTRACT: Data are presented on the loss arising in a laser resonator when the mirror tilt angle is relatively large (1-2'). The tests were made on a neodymium-glass laser with bleached ends, using rods of various diameters and lengths. The loss was determined by comparing the dependence of the threshold pump energy on the mirror misalignment and on the mirror reflection coefficient. The results are presented in the form of plots of  $\log(1 - \rho)$  vs  $\alpha$  ( $\rho$  = relative loss,  $\alpha$  = tilt angle), so that the resultant curves are straight lines. An empirical formula  $-\log(1 - \rho) = 10^{-2} \alpha^{0.42}$  ( $l$  = length of rod in meters) is derived on the basis of the results. The results show also that at certain rod orientations the inhomogeneities in the rod cancel out in part the effect of the misalignment. Orig. art. has: 2 figures and 1 formula. [02]

Card 1/2

L 63382-65

ACCESSION NR: AP5019765

ASSOCIATION: none

SUBMITTED: 24 Jul 64

NG REF SOV: 000

ENCL: 00

OTHER: 002

SUB CODE: Ec, of

ATD PRESS: 4080

dm  
Card 2/2

AP6018895

SOURCE CODE: UR/0237/66/000/006/0046/0046

AUTHOR: Vanyukov, M. P.; Venchikov, V. A.; Zhulay, V. Ya.; Isayenko, V. I.; Lyubimov, V. V.

56  
B

ORG: none

TITLE: Two-channel single-pulse laser with an energy of 180 joules

SOURCE: Optiko mekhanicheskaya promyshlennost', no. 6, 1966, 46

TOPIC TAGS: solid state laser, laser emission, neodymium glass

ABSTRACT: An investigation was made of a laser in which high emission energy of the light pulse was obtained by the use of neodymium glass rods. Cylindrical specimens of glass (45 mm in diameter and 250 mm long) activated with neodymium were connected in series-parallel. Each specimen was optically pumped by six direct pulse lamps placed in a multielliptical illuminator. The laser consisted of two identical channels, each containing three rods assembled on one axis. Q-modulation was done by two prisms fixed on a common shaft rotating at 18,000 rpm. The light diameter of the prism (30 mm) was coordinated with the light diameter of the operating rod by means of a Galileian tube. The experiments showed that for effective pumping of an operating body 45 mm in diameter the content of Nd<sub>2</sub>O<sub>3</sub> should not exceed 4%. In this way it is possible to obtain an amplification coefficient of one rod equal to 3 and provide a yield energy of 25—30 joules from one specimen. Connecting the rods

Card 1/2

UDC: 621.378.324:621.376

L 29565-66

ACC NR: AP6018895

in series reduces the amplification of optical pumping, owing to the appearance of free generation of the whole channel. This difficulty can be eliminated by introducing, between the rods, optical decoupling filters made of uranyl glass. The filters, together with the operating rods, are placed in the laser illuminators and are pumped simultaneously with the rod. The optical density of the filter is selected in such a way that at maximum pumping no free generation appears in the laser channel; when the filters are illuminated at the moment when maximum Q for the resonator is reached, one light pulse is generated. By introducing optical decoupling, emission with an energy of 90 joules at  $10^{-7}$  sec duration was obtained from one channel of the laser. The angular distribution of generated radiation improves as the optical pumping increases. Synchronous inclusion of two laser channels was obtained by appropriate adjustment of the laser elements. The time spread of the pulses emitted by both channels did not exceed  $10^{-8}$  sec. With the simultaneous inclusion of two channels, a light pulse with an energy of 180 joules (corresponding to an emission intensity of 1.5 to 2 hw) was generated. [JA]

SUB CODE: 20/ SUBM DATE: 07Apr66/ ORIG REF: 001/ ATD PRESS: 5014

Card 2/2 CC

L 20618-66 FBD/EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/ETC(f)/EPF(n)-2/ENG(m)/T/EWP(k)/  
ACC NR: AF6012184 EWA(h) IJP(c) SOURCE CODE: UR/0386/66/003/008/0316/0318

WG/AT/WH  
AUTHOR: Varyukov, M. P.; Isayenko, V. I.; Lyubimov, V. V.; Serebryakov, V. A.; 96  
Shorokhov, O. A. B

ORG: none

TITLE: Use of a laser operating in the spike mode to obtain a high-temperature plasma 2/

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 8, 1966, 316-318

TOTPIC TAGS: laser application, laser pulsation, neodymium glass, high temperature plasma, discharge plasma, gas ionization

ABSTRACT: Since the use of a laser for gas ionization or production of a high-temperature plasma is usually limited to light pulses of duration  $10^{-7}$ — $10^{-8}$  sec, and for certain applications, say to accelerate chemical reactions, it may be of interest to obtain longer action of the electromagnetic field of the light wave on the plasma, the authors have experimented with ionization of air with the aid of radiation from a laser operating in the spike mode, with total generation duration of about one millisecond. The neodymium-glass laser used in the investigation yielded light pulses with energy 800—1400 J. Neodymium-glass rods of 45 mm diam-

Card 1/2

L 20618-66

ACC NR: AF6012184

eter and 600 mm long were used, with 2 and 4 per cent concentration of  $\text{Nd}_2\text{O}_3$ . An elliptic illuminator with six conjugate ellipses and straight pump flash lamps was used. The average laser radiation power, at a flash duration 0.8--1.2 msec, was 1--2 Mw, but, taking into account the off-duty factor between spikes, the maximum radiation power could reach 10--30 Mw. When this radiation was focused in air with a 100 mm focus lens a power density 1--3  $\text{Gw/cm}^2$  and a field intensity of the order of  $10^7$  v/cm were obtained, enough to produce a high-temperature plasma in air. Photographs show that the plasma produced by the gas breakdown is optically opaque and that the laser emission of  $1.06 \mu$  wavelength is absorbed in the thin front layer of the cloud. Orig. art. has: 1 figure. [02]

SUB CODE: 20/ SUBM DATE: 24-Feb66/ ORIG REF: 001/ OTH REF: 001  
ATD PRESS: 4225

Card 2/2 BK

L 45146-66 EWT(1)/EEC(k)-2/T/EWP(k) LJP(c) WG  
ACC NR: AP6026975 SOURCE CODE: UR/0051/66/021/002/0224/0227

38  
B

AUTHOR: Lyubimov, V. V.

ORG: none

TITLE: The critically-narrow directivity of laser beams 25

SOURCE: Optika i spektroskopiya, v. 21, no.2, 1966, 224-227

TOPIC TAGS: laser theory, laser r and d, laser resonator, resonator tuning, laser beam, beam directivity

ABSTRACT: A theoretical study was made of the allowable deviation of resonator mirrors from parallelism and the degree of inhomogeneity of an active medium and the magnitude of losses which must be introduced for extra-axial modes in order to narrow the directivity of a real laser resonator. The theoretical results were in agreement with the experimental. A resonator 6 mm in diameter and 2800 mm long was used. A 5" misadjustment of the resonator mirrors increased the angular beam distribution from 40" to 1'20". Orig. art. has: 13 formulas. [YK]

SUB CODE: 20/ SUBM DATE: 09Mar65/ ORIG REF: 001/ OTH REF: 005

UDC: 621.375.9:535.01

Card 1/1 *auw*



ACC NR: AF7004143

SOURCE CODE: UR/0051/67/022/001/0123/0126

AUTHOR: Kalinin, V. P.; Lyubimov, V. V.

ORG: none

TITLE: Influence of misalignment of laser cavity mirrors on the angular distribution of laser emission

SOURCE: Optika i spektroskopiya, v. 22, no. 1, 1967, 123-126

TOPIC TAGS: solid state laser, neodymium glass laser, electrooptic effect, image converter, laser cavity, beam divergence

ABSTRACT: The authors measured the laser beam divergence angle and the deviation of the beam from a perpendicular direction to the plane of the mirror, as functions of the misalignment of the mirrors for different resonator lengths (500 - 2800 mm) and different resonator diameters (2.6 - 15 mm). A neodymium-glass laser was used. The laser emission was photographed through an electrooptical converter whose cathode was placed in the focal plane of the lens. In the case of small misalignment (not exceeding  $\alpha_0 = 2\lambda^2 l / d^3$ , where  $l$  is the length and  $d$  the diameter of the cavity and  $\lambda$  is the wavelength), the broadening of the angular distribution varies linearly from  $\lambda/d$  at zero misalignment to  $2\lambda/d$  at a misalignment angle  $\alpha_0$ ; this is in good agreement with theoretical results by one of the authors (Lyubimov, Opt. i spektr. v. 21, 224, 1966). In the case of larger misalignment angles the radiation becomes distributed over individual discrete directions, the angle distance between which is equal to

Card 1/2

UDC: 621.375.9: 535

ACC NR: AP7004143

double the misalignment angle. A plot of the angular distribution against the relative misalignment shows that the former increases like the cube root of the relative misalignment angle. The deviation of the beam from the direction normal to the surface of the mirror is approximately equal to  $(d\alpha/l)^{1/2}$ . All the results agree well with the earlier theoretical studies and with earlier experiments by the authors (Opt. i spektr. v. 19, 286, 1965). Measurements of the beam deviation make it possible to estimate the losses in the resonator, and these results agree with calculations by L. A. Vaynshteyn (ZhETF v. 44, 1050, 1963). Orig. art. has: 4 figures.

[WA-14] [02]

SUB CODE: 20/ SUBM DATE: 18Aug65/ ORIG REF: 004/ OTH REF: 001

Card 2/2

LYUBIMOV, V. V.

AUTHOR: BERMAN S.D., LYUBIMOV V.V. 42-5-5/17

TITLE: Groups Admitting an Arbitrary Displacement of the Factors of Their Composition Series (Gruppy dopuskayushchiye lyubnoye perestankovku faktorov kompozitsionnogo ryada)

PERIODICAL: Uspekhi Mat.-Nauk, 1957. Vol. 12, Nr. 5, pp. 181-184 (USSR)

ABSTRACT: Let  $G$  be a group with a composition series of the length  $s$ ; let

$$(1) \quad \bar{1}, \bar{2}, \dots, \bar{s}$$

be the factors of this composition series.  $G$  admits an arbitrary displacement of the factors of the composition series if to an arbitrary permutation  $\bar{1}, \bar{2}, \dots, \bar{1}_s$  of the factors (1) there corresponds a composition series  $G = G_1 \supset \dots \supset G_{s+1} = 1$  such that  $G_j/G_{j+1} \cong \bar{1}_j$  ( $j=1, \dots, s$ ). A group with a composition series all the factors of which are isomorphic to the same simple group  $\bar{1}$  is called a  $\bar{1}$ -group.

Theorem: The group  $G$  with a composition series admits an arbitrary displacement of the factors of the composition series then and only then if it can be represented as a direct product of  $\bar{1}$ -groups.

Card 1/2

Groups Admitting an Arbitrary Displacement of the Factors of Their Composition Series 42-5-5/17

Let  $\mathcal{M} = \{ \pi_1, \dots, \pi_k \}$  be a finite set of pairwise not isomorphic simple groups. A group with a composition series is called an  $\mathcal{M}$ -group if the set of the different factors of the composition series is identical with  $\mathcal{M}$ .

Theorem: Let  $G$  be an  $\mathcal{M}$ -group and let  $\mathcal{M}_1, \dots, \mathcal{M}_r$  be subsets of  $\mathcal{M}$  ( $\bigcup_{i=1}^r \mathcal{M}_i = \mathcal{M}$ ) being pairwise free of common elements.

The composition series of  $G$  admits an arbitrary displacement of the subsets  $\mathcal{M}_1, \dots, \mathcal{M}_r$  then and only then if  $G$  is a direct product of the  $\mathcal{M}_i$ -groups ( $i=1, \dots, r$ ).

One Soviet reference is quoted

SUBMITTED: October 15, 1956  
AVAILABLE: Library of Congress

1. Groups (Mathematics)-Theory

GORODENSKIY, S.N.; KATETSKAYA, A.P.; KRYLOV, V.I.; LUKIN, I.I.;  
LYUBIMOV, V.V.; MAKSIMOV, N.V.; SAVVIN, L.G.; TIMOSHIN, A.V.;  
SHEVELEV, P.N.

Professor G.I. Shturman; on his 60th birthday. Elektri-  
chestvo no.11:87 N '63. (MIRA 16:11)

VOROVICH, I.I., doktor fiz.-matem. nauk, prof.; LYUBIMOV, V.Ya.; SAFRONOV,  
Yu.V., kand. fiz.-matem. nauk, dotsent; SOFRONOV, Ye.I., kand.  
tekhn. nauk; USTINOV, Yu.A., kand. fiz.-matem. nauk

Reliability of fitting rim bands on gear-wheel centers. Vest.  
mashinostr. 45 no.7:23-26 J1 '65. (MIRA 18:10)

MCROZOV, B.A.; VASIL'YEV, V.V.; LYUBIMOV, V. Ya.

Increasing the strength of fillet joints of cylinders and  
flanges. Kuz.-shtam. proizvod. no.4:31-32 Ap '61. (MIRA 14:3)  
(Flanges)

LYUBIMOV, Ya.I., inzh.

Perfectly organized plant. Inform. biul. VDNKH no.10:  
3-5 '63. (MIRA 18:5)



LYUBIMOV, Ye., inzhener.

A powerful swing chute. Mast. ugl. 4 no. 12:15-16 D '55. (MLBA 9:3)  
(Soviet Far East--Excavating machinery)

LYUBIMOV, Ye. A., inzh. (Khar'kov); MEL'NICHENKO, P. A., inzh. (Khar'kov)

It is possible to prevent tie damage caused by spike holes.  
Put' i put. khoz. 6 no.8:30-31 '62. (MIRA 15:10)

(Railroads—Ties)

S/049/63/000/003/001/005  
L218/D307

**AUTHOR:** Lyubimov, Ye. A.

**TITLE:** Distribution of thermoelastic stresses inside the earth and the rate of their accumulation

**PERIODICAL:** Akademiya nauk SSSR. Izvestiya. Seriya geofizicheskaya, no. 3, 1963, 385-390

**TEXT:** The distribution of thermoelastic stresses and strains with depth is investigated for different assumptions about the distribution of temperature and its variation with time so that the rate of accumulation of stresses and the increase in the radius can be estimated. The reduction in the coefficient of thermal expansion with increasing depth is taken into account. It is shown that tangential stresses reach a maximum in the upper part of the earth's mantle. They are positive in the upper 50 km of the mantle and negative between 50 and 1000 km. This means that the stresses are tensile in the upper 50 km and compressible

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Distribution of...

S/049/63/000/003/001/005  
D218/D307

below this layer. The radial stresses are much smaller than the tangential stresses. They are negative at depths down to 100 km and are therefore compressible in the upper layers and tensile at larger depths. The difference between tangential and radial stresses becomes equal to zero at depths of the order of 100 km for an earth with a silicate core and at 50 km for an iron core. The difference then becomes positive, reaching a maximum at 200 - 400 km. Beginning with 600 - 800 km, the difference falls off rapidly. Estimates of the rate of change of the radius showed that this quantity decreases with time because the rate of heating of the central parts of the earth decreases owing to the decay of radioactive elements. At present, the rate of increase in the radius is 3.5 cm per 1000 years. There are 7 figures.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli (AS USSR, Institute of the Physics of the Earth)

SUBMITTED: June 6, 1962

Card 2/2

LYUBIMOV, Ye.I.; KOSMATOV, H.V.

Preserving the emulsion layer of films. Patent U.S.S.R. 77,395, Dec. 31,  
1949.  
(CA 47 no.19:9834 '53)

LYUBIMOV, Ye.M., inzhener.

Efficient means of combating clay sticking to conveyer rollers  
and drums. Mekh.trud.rab. 10 no.6:38-39 Je '56. (MLRA 9:8)  
(Conveying machinery)

MEDOVAYA, A.S.; LYUBIMOV, Ye.M.

Demountable platform for moving electric motors. Gidroliz. i  
lesokhim. prom. 14 no.5:17 '61. (MIRA 16:7)

1. Leningradskiy gidroliznyy zavod.  
(Separators (Machines)—Electric driving)

LYUBIMOV, Ye.M., inzhener.

Using excavators for loading coal on self-propelled transporting  
swing chutes. Mekh.trud.rab. 11 no.3:32-33 Nr '57. (MLRA 10:5)  
(Excavating machinery)  
(Coal handling machinery)



LYUBIMOV, Ye.P., inzh.

Safe tongs for carrying high-voltage excavator cable. Bezop.trada  
v prom. 5 no.4:26-27 Ap '61. (MIRA 14:3)

1. Nazarovskiy ugol'nyy razrez.  
(Tools)

LYUBIMOV, Ye.P. (gorod Nazarovo)

Device for repairing pipelines. Vod. i san. tekhn. no. 9:33 3 164.  
(MIRA 1961)

68031

SOV/155-58-6-33/36

24(7) 24,3410

AUTHORS: Lyubimov, Yu.A., Yegorov, M.M.

TITLE: Infrared Absorption Spectra of Water Molecules  
Adsorbed on a Microporous Glass

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki,  
1958, Nr 6, pp 208-211 (USSR)

ABSTRACT: A comparison of the papers [Ref 1] and [Ref 2] shows that the conceptions concerning the adsorption of water molecules on microporous glass or silica gel are very different. In order to clear this question the authors consider the absorption spectra of water adsorbed on the surface of microporous glass, where simultaneously the adsorption isotherm is measured. These experiments lead among others to the following results: Before the adsorption of water vapor a soaked glass shows a very intensive absorption band  $\nu_1 = 7340 \text{ cm}^{-1}$ , under increasing adsorption of water  $\nu_1$  becomes slowly smaller (to about  $7300 \text{ cm}^{-1}$ ), simultaneously there arise the bands  $\nu_2 = 7240 \text{ cm}^{-1}$  (corresponds to the adsorbed water) and

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68031

31

Infrared Absorption Spectra of Water Molecules  
Adsorbed on a Microporous Glass

SOV/155-58-6-33/36

$\nu_3 = 7130 \text{ cm}^{-1}$  (corresponds to the capillary-condensed water).

From this it is concluded that the character of the surface is particularly heterogeneous. The irreversible character of the adsorption (irreversible hysteresis) is proved. There are 2 figures, and 5 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova  
(Moscow State University imeni M.V. Lomonosov)

SUBMITTED: October 21, 1958

Card 2/2

68894

S/051/60/008/02/021/036  
E201/E391

04 1410  
AUTHORS: Bogomol'nyy, A.M. and Lyubimov, Yu.A.

TITLE: Infrared Absorption Spectra of Microporous Glass with Methanol and Phenol Adsorbed from Solutions in Carbon Tetrachloride

PERIODICAL: Optika i spektroskopiya, 1960, Vol 3, Nr 2, pp 257 - 259 (USSR)

ABSTRACT: The authors studied changes in the intensity of the band representing the first harmonic of the OH-groups of the microporous glass surface with methanol and phenol adsorbed from low-concentration solutions in  $CCl_4$ . A double-beam infrared spectrometer IKS-2 with a glass prism F-1 was used. Microporous glass samples of 8.5 mm thickness were prepared using a technique described by Yaroslavskiy (Ref 1); their specific surface area was  $275 \text{ m}^2/\text{g}$ . Before each series of experiments the samples were etched in nitric-acid vapours for ten hours, carefully washed in distilled water and heated for twelve hours in vacuum at  $300^\circ\text{C}$ . Then the samples were placed for 12-15 hours in cells with appropriate solutions. The

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S/051/60/008/02/021/036

E201/E391

Infrared Absorption Spectra of Microporous Glass with Methanol and Phenol Adsorbed from Solutions in Carbon Tetrachloride

following bands were observed in the infrared spectrum of a sample immersed for 12-15 hours in pure  $CCl_4$ : a narrow strong band at  $7\ 250\ cm^{-1}$  (first harmonic of valence vibrations of the surface OH-groups), a weak band at  $5\ 290\ cm^{-1}$  (harmonic of a composite valence-deformational vibration  $\nu_{OH} + \delta_{OH}$  of adsorbed water) and a band of medium intensity at  $4\ 470\ cm^{-1}$  which probably consisted of a second harmonic of deformational vibrations of the surface OH-groups and one of the harmonics of atomic vibrations in  $SiO_4$  tetrahedra. In the absorption spectra of glass samples immersed in solutions of methanol and phenol in  $CCl_4$  the following regularities were observed in the behaviour of the  $7\ 250$ ,  $5\ 290$  and  $4\ 470\ cm^{-1}$  bands:

- 1) with increase of the solution concentration the intensities of the three bands varied periodically passing through maxima and minima (cf. figure on p 258);

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S/051/60/008/02/021/036

E201/E391

Infrared Absorption Spectra of Microporous Glass with Methanol and Phenol Adsorbed from Solutions in Carbon Tetrachloride

2) in the case of methanol the maxima and minima of the three bands coincide, i.e. they occur at the same concentrations but in the case of phenol this coincidence is observed only in the case of the 7 250 and 4 470  $\text{cm}^{-1}$  bands; 3) the periodic minima and maxima of the band intensities are clear until the adsorbed films on glass reach a thickness of one mono-layer; with further increase of the solution concentration the minima gradually disappear. Similar periodic maxima and minima were found in the infrared absorption spectra of microporous glass when methanol was adsorbed on it from vapour phase (intensities of the bands were plotted against vapour pressure). The observed behaviour of the infrared band intensities and the anomalies in the isotherms of adsorption and heats of adsorption from solutions, reported by Kiselev and Krasil'nikov (Refs 7,8) have a common, but as yet unknown, origin. Acknowledgments are made to A.S. Predvoditelev, V.F. Kiselev and K.G. Krasil'nikov for their advice. ✓

Card3/4

68894

S/051/60/008/02/021/036

Infrared Absorption Spectra of Microporous Glass with Methanol and  
Phenol Adsorbed from Solutions in Carbon Tetrachloride  
E201/E391

There are 1 figures and 8 Soviet references.

SUBMITTED: June 16, 1959

✓

Card 4/4



TEREKHINA, M.T., prof.; BOBYLEVA, Z.I., dotsent; SIPKO, I.I.; KOTENKO, N.  
A., assistant; LYUBIMOV, Yu.A., assistant; ZIBOROVA, V.P., ordi-  
nator

Ultraviolet rays in the practice of merino sheep farming. Veteri-  
naria 40 no.2:49-51 F '63. (MIRA 17:2)

1. Stavropol'skiy sel'skokhozyaystvennyy institut.

TEREKHINA, M.T., prof.; BOBYLEVA, Z.I., dotsent; SIPKO, I.I., dotsent; LYUBIMOV, Yu.A., assistant; KOTENKO, N.A., ordinator; ZIBOROVA, V.P., ordinator

Disorder of metabolism in cows and the characteristics of dyspepsia in calves. Veterinariia no.12:31-34 D '63. (MIRA 17:2)

1. Stavropol'skiy sel'skokhozyaystvennyy institut.

87379

S/120/60/000/004/021/028  
E073/E535

21.5300

AUTHORS: Zlobin, L.I. and Lyubimov, Yu.I.  
TITLE: Transistorized Pre-amplifier for Scintillation Counter  
PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No.4.  
pp.137-138

TEXT: The pre-amplifier is a two-stage one, Fig.1  
(Bx - input; Bbx - output and Unum - supply voltage)

The best transfer coefficient and the maximum input resistance can be obtained by using diffusion type transistors, П-402 (P-402). The transfer coefficient K of a circuit with P-402 transistors is independent of the voltage in the range of 2.5 to 25 V with a capacitive load of 300 pF. Fig.2 shows the dependence K(U) for П-14 (P-14) transistors. The investigation was carried out using signals from a signal generator ГСВ (FEU). For the first case, the dependence of the maximum linear signal at the output of the supply voltage was as follows

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87379  
S/120/60/000/004/021/028  
E073/E535

Transistorized Pre-amplifier for Scintillation Counters

Table 1

Supply voltage U, V	7	10	13	15	18	25
Maximum linear signal, V	2.7	4.3	6	7	8.2	10.5

Comparison of the here given results shows clearly that P 402 transistors are preferable. In the case of operation with a long matched cable (100 Ohm), the transfer coefficient of the circuit with P-402 transistors equals 0.66, whilst that with P-14 transistors equals 0.18. The stability of the transistor parameters with time and also the thermal stability is ensured by using large emitter loads (in terms of d.c.), since in the same way as in the paper of Graveson and Sadowski (Ref.1) the stability was better than 1% during eight hours continuous operation. The duration of pulse rise time (for the circuit with P 402 transistors) is better than

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87379

S/120/60/000/004/021/001  
E073/E535

### Transistorized Pre-amplifier for Scintillation Counters

0.1  $\mu$ sec (from 0.1 to 0.9 of its height). The input resistance of such a pre-amplifier (using P-402 transistors with a  $U_{feed} = -20$  V) is about 500 kOhm. The pre-amplifier can be used successfully in conjunction with a scintillation spectrometer with a NaI(Tl) crystal and also ФЭУ-С (FEU-S) and ФЭУ-13 (FEU-13). There are 2 figures, 2 tables and 1 non-Soviet reference.

(Note: This is a slightly abridged translation)

ASSOCIATION: Institut radiatsionnoy gigiyeny (Institute of Radiation Hygiene)

SUBMITTED: June 24, 1959

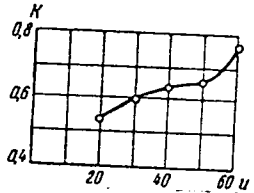


Рис. 2. Зависимость коэффициента передачи  $K$  от напряжения питания  $U$  для схемы, собранной на транзисторах П-14

Card 3/3

Fig. 2

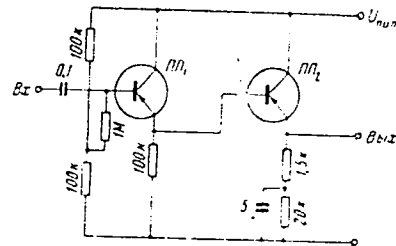


Рис. 1. Принципиальная схема пред-усилителя

LYUBIMOV, Yu.N.

Device for tightening pins and taking out of stop forging  
crank presses. Sbor. Novo-Kram. mashinostroi. zav. no.3:  
64-68 '59. (MIRA 17:1)

BACHILO, I.; LYUBIMOVA, A.; PETROV, L., red.; MOSKVINA, R., tekhn.  
red.

[The October District of Moscow] Oktiabr'skii raion Moskvyy.  
Moskva, Sotsekgiz, 1962. 161 p. (MIRA 15:10)  
(Moscow--History) (Moscow--Description)

LYUBIMOVA, A.I., kand.med.nauk

Late results of treating erosion of the uterine cervix by electrocoagulation combined with furacillin. Sov.med. 22 no.8:113-118 F '58. (MIRA 11:4)

1. Iz 1-y Rizhskoy gorodskoy bol'nitsy  
(CERVIX, UTERINE, dis.  
erosion, ther., electrocoagulation with adjuvant nitrofurazone (Rus))  
(ELECTROCOAGULATION, in various dis.  
erosion of cervix, with adjuvant nitrofurazone (Rus))  
(NITROFURAZONE, ther. use  
erosion of cervix, adjuvant with electrocoagulation (Rus))



LYUBIKOVA, A.I., inzh.; PETRUKHIN, P.M., inzh.

Hydrophobic inert dust. Bezop. truda v prom. 2 no.2:7-8 F '58.  
(MIRA 11:2)

1. Makeyevskiy nauchno-issledovatel'skiy institut po bezopasnosti  
rabot v gornoy promyshlennosti.  
(Dust)

PETRUKHIN, P.M.; LYUBIMOVA, A.I.

Moisture-resistant inert dust for mines. Biul.tekh.-ekon.inform  
no.8:3-4 '59 (MIRA 13:1)  
(Mine dusts--Safety measures)

LYUBIMOVA, A.I.; TIMOFEYEV, V.A.

Dust formation in coal and rock technological units on the mine surface. Bor'ba s sil. 5:243-253 '62. (MIRA 16'5)

1. Makeyevskiy nauchno-issledovatel'skiy institut po bezopasnosti rabot v gornoy promyshlennosti.  
(Coal handling machinery) (Dust)

LYUBIMOVA, A.I.

Possibility of using biopsy and electrocoagulation in erosion of the cervix uteri in urban and rural consultation centers. Sov.med. 23  
no.11:133-136 N '59. (MIRA 13:3)

1. Iz 1-y gorodskoy bol'nitsy Rigi (glavnyy vrach E. Cherepovich).  
(CERVIX UTERI diseases)  
(ELECTROCOAGULATION)  
(BIOPSY)

LYUBIMOVA, A.I., kand. med. nauk

Insufficiency of the cervix uteri as a cause of habitual late  
abortion; a review of literature. Akush. i gin. 40 no.2:3-17  
Mr-Apr '64. (MIRA 17:11)

1. Institut akusherstva i ginekologii (dir. - prof. S.V. Makeyeva)  
Ministerstva zdravookhraneniya SSSR, Moskva.

PA 245T64

USSR/Nuclear Physics - Ion Source 11 Oct 52

"Secondary Processes in the Ion Source of a Mass Spectrometer," V. L. Tal'rose and A. K. Lyubimova

"Dok Ak Nauk SSSR" Vol 86, No 5, pp 909-912

Investigated secondary processes during ionization of individual hydrocarbons, saturated (methane, ethane, propane, butane) and unsaturated (ethylene, propylene, isobutylene), especially formation of "methanic ion"  $\text{CH}_5^+$ , found similar to  $\text{H}_3^+$ . Indebted to V. N. Kondrat'yev, Corr Mem, Acad Sci USSR. Submitted by Acad N. N. Semenov 27 Aug 52.

245T64

LYUBIMOVA, A. K.  
USSR/ Physics - Mass spectrum

FD-3150

Card 1/4      Pub. 153 - 6/26

Author        : Dekabrun, L. L.; Lyubimova, A. K.

Title         : System of automatic magnetic scanning of mass-spectra

Periodical   : Zhur. tekhn. fiz., 25, No 13 (November), 1955, 2282-2285

Abstract     : One of the principal units of the mass-spectrometer intended for molecular analysis is the system of spectrum scanning. The best method for scanning is the variation of the magnetic field strength of the mass-separator. For the satisfaction of most practical problems the scanning must encompass the range of masses from 12 to 200. In certain cases there arises the necessity of expanding this range toward one or the other side. The principal difficulties of the realization of magnetic scanning are not the overlapping of the indicated range of masses (V. L. Tal'roze, ZhTF, same issue, p. 2280-2281), but, on the one hand, the exclusion of spontaneous fluctuations in the magnetic field strength in the scanning process and, on the other hand, the automatization of the scanning process which would jointly with the recording system ensure the minimum time expended upon the recording of the spectrum. The latter consideration makes desirable the variation of the magnetic field strength in accordance with the exponential law according to time (see V. L. Tal'roze, op. cit.). The problem of magnetic scanning of mass-spectra was solved by the authors

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FD-3150

in connection with the development of an analytic mass-spectrometer MS-1 (Tekhnicheskaya dokumentatsiya promshlennogo obraztsa mass-spektrometer MS-1 [Technical documentation of industrial sample of the mass-spectrometer MS-1]), in which for overlapping of mass range 12-200 with accelerating potential of 1900 volts there is required (taking into account hysteresis) a change in the current of the mass-separator's electromagnet from 20 to 140 microamperes. Elimination of magnetic field fluctuations inadmissible during taking of mass-spectra is effected by strict stabilization of the current in the windings of the electromagnet at each value of this current established during the scanning process. As noted by the authors, the literature has published only one system of automatic magnetic scanning of wide mass-spectra (J. A. Hipple, D. J. Grove, W. M. Hickam, Rev. Sci. Instr., 16, 69, 8, 1945; D. Grove, J. Hipple, Rev. Sci. Instr., 18, 337, 1947). In this system (see figure of Hipple scanning circuit) stabilization of current in the windings of magnet is realized indirectly: one stabilizes the voltage of the source supplying the circuit controlling the magnet current and maintains practically invariable the consumption of current from this source etc. The scanning system developed by the authors is a system of current stabilization directly in the windings of the scanning electromagnet; each value of the current strength in the electromagnet is assigned by the supporting potential of the stabilization system, this potential being able to vary, together with the current in the electromagnet



FD-3150

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windings, according to any law in time, including the exponential law. The current stabilization system is an ordinary system of static regulation: the current in the electromagnet windings  $I_m$  flows through constant control resistance  $R_e$  the voltage drop  $U_1 = I_m R_e$  in which is compared with the support potential  $U_0$ ; an electronic circuit of great sensitivity tries to maintain the equality of these voltages, thanks to which practically full proportionality between current  $I_m$  and support voltage  $U_0$  is attained:  $I_m \approx U_0 / R_e$ . Departure from exact proportionality is determined by the circuit parameters, considered by the authors in the remainder of their work. The principles governing the scanning circuit realized by the authors are shown in figure 2 (Theoretical circuit of smooth scanning in a wide range): The electromagnet winding is connected to the anode link of the output tube of the electronic circuit (this tube is characterized by large transconductance  $S$ ), and control resistance  $R_e$  is connected to cathode line; the voltage difference  $I_m R_e - U_0$  is amplified by a voltage amplifier  $k$  times and is fed into the controlling network of the output tube, here the exact relation between support voltage and current having the following form:  $I_m = k S U_0 / (k S R_e + 2)$ , which passes over into the above-mentioned expression  $I_m \approx U_0 / R_e$  for large values of effective transconductance of the electronic circuit  $k S$ . On a similar principle the authors constructed the system for the stabilization of current in the magnet of the mass-spectrometer MS-1; in this system, however, the magnet's windings, just as the control resistance, are connected to the cathode link of the output tube, in consequence of which

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FD-3150

the dynamic range of normal amplifiers of voltage turns out to be insufficient for overlapping of the entire scanning range into one receiver; therefore along with a smooth regulation of magnet current use is made of step change-over of regulation limits (e.g. in the system MS-1, in which exists current variation from 5 to 500 microamperere, there are 17 such steps). The necessity of carrying out step change-over complicates the automatization of the scanning process. The authors' scanning system was realized in two variants: with linear and exponential variation of the magnetic field strength in time, the difference between these variants consisting only in the methods of obtaining the support voltage: in the case of the linear scanning the support voltage is taken from the rheochord set in motion by a reversing electric motor, and in the case of exponential scanning the support voltage is obtained in link of a condenser discharging into fixed R.

Institution :

Submitted : May 25, 1955

LYUBIMOVA, A.K

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8/120/60/000/006/021/045  
8032/5514

9: 6450  
S. 5700 (10 03, 12 21, 1973)  
26. 28 12  
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A. 11 11 11

Tal'rose, V.L., Dekebrun, L.L., Tsanagrat, G.D.,  
Frankovich, Ye.L., Vetrov, O.D., Lyubimova, A.K.,  
Korotkiy, G.K., Perofay, V.I., Gribin, V.B.,  
Shurak, V.B. and Iukhvidin, A.Ye.

The PMC-2 (RMS-2) Mass Spectrometer Designed for  
Studying Chemical Reactions and the Determination of  
Free Radicals

PERIODICAL: Pribery i tekhnika eksperimenta, 1960, No. 6, pp. 78-84

**TITLE:**  
A double magnetic mass-spectrometer designed for study-  
ing reactions in the gas phase and, in particular, for the  
determination of free radicals is described. Two methods are used  
to produce the ions. In the first method, the mixture to be  
analysed is ionized by charge transfer to excited ions.  
The latter are formed in a separate ion gun by means of electron  
bombardment and are mass-analyzed in a small magnetic analyzer.  
In the second method the mixture under consideration is ionized  
directly by electron bombardment. Quasi-monochromatization is  
achieved by a method based on that reported by Fox et al. (Ref. 11).  
The gas from the reactor is introduced into the ion source in the  
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The PMC-2 (RMS-2) Mass Spectrometer Designed for Studying Chemical  
Reactions and the Determination of Free Radicals

form of a molecular beam which is mechanically interrupted at a  
known frequency. In distinction to the method described by Foner  
and Huxson (Ref. 2), in which the molecular and ion beams are  
perpendicular, in the present system the two beams are axial,  
which means that smaller angles are necessary for excitation,  
and the ionization region is smaller. It is possible to reduce  
the latency of the background mass-spectrum. A particular feature  
of the present instrument is the use (in the measuring part of the  
spectrometer) of E-stabilization of parameters such as the  
accelerating voltage, the voltage supplying the detector, the  
emission current of the ion gun cathode, and the supply voltage for  
the ion source cathode. This was described by the second of the  
present authors in Ref. 10. The mass numbers are determined from a  
knowledge of the magnetic field which in turn is measured with the  
aid of a Hall probe (germanium crystal). The basic mass spectro-  
metric arrangement employed is shown in Fig. 2. Products of  
chemical reactions taking place in the reactor I enter the  
region II through a small aperture in the thin glass diaphragm 6  
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in the form of a molecular beam. This molecular beam is collimated  
either by the diaphragm 6 which separates the volume II from  
the region in which ionization takes place. A movable screen 7  
is placed in front of the diaphragm 6 and interrupts the molecular  
beam 55 times per sec. In the case of ionization by charge transfer,  
the primary ions are produced in the ion gun III. The ion beam  
formed there is mass analyzed in the 90° magnetic analyzer IV  
which has a working radius of 100 cm. The primary ion beam, consist-  
ing of ions of the required mass, intersects the molecular beam and  
charge transfer takes place. In the case of ionization by electron  
impact, the source becomes analogous to that described by Foner  
and fourth of the present authors in Ref. 10. In the case of ioniza-  
tion by a monochromatized electron beam, the modulation of the  
ion current is achieved by means of a chopper 7. The modulation of the  
ion current in the mass-spectrometer is not employed. The ion current  
is measured by means of a multiplier. The vacuum chamber of the mass-spectro-  
meter is an all-metal system and all the sections are out-gassed at  
300 to 350°C before the operation is begun. As an illustration of  
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80706

8/120/60/000/006/021/045  
R032/E514

The PMC-2 (RMS-2) Mass Spectrometer Designed for Studying Chemical Reactions and the Determination of Free Radicals

The possible applications of the instrument, data are quoted on the formation of free radicals in the pyrolysis of hydrazine. In these experiments the hydrazine entered from a K<sub>2</sub> container into a quartz capillary through a control, of which the hydrazine to a known temperature, as a result of which the hydrazine decomposed into nitrogen, hydrogen, ammonia and some unstable products (fomer and later, Ref.18). Fig.7 shows the distribution of like intensities in the mass-spectrum of hydrazine obtained by the charge transfer method using H<sub>2</sub> ions formed from ammonia. The pressure of the source was 5 x 10<sup>-5</sup> mm Hg and the pressure in the chamber of the small analyzer was 4 x 10<sup>-5</sup> mm Hg. For comparison, the dotted line shows the mass-spectrum obtained on bombarding hydrazine with 50 eV electrons. Fig.8 shows the intensity distribution obtained under similar conditions at 1000°C (dotted lines) and 25°C (continuous lines). Acknowledgments are expressed to Ye. K. Kuziyan, B. T. Vorob'yev, B. G. Balov, M. M. Morozov and M. I. Markin for assistance in this work. There are 8 figures and 20 references: 11 Soviet and 9 non-Soviet.

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The PMC-2 (RMS-2) Mass Spectrometer Designed for Studying Chemical Reactions and the Determination of Free Radicals

ASSOCIATION: Institut Khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AS, USSR)

SUBMITTED: October 13, 1959

Fig.2

I - reactor, III - ion gun, IV - small magnetic analyzer,  
V - large magnetic analyzer

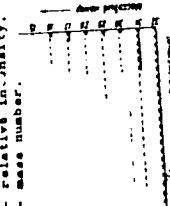


Card 5/6

R032/E514

The PMC-2 (RMS-2) Mass Spectrometer Designed for Studying Chemical Reactions and the Determination of Free Radicals

Fig.7  
Comparison of mass-spectra of hydrazine obtained on electron bombardment (dotted lines) and charge transfer from H<sub>2</sub> ions (full lines). Key: 1 - relative intensity, 2 - mass number.



Card 6/6

KURAYTIS, S.A.; KHOKHLOV, I.A.; LYUBIMOVA, A.M.

Characteristics of tanning with basic chrome salts in the presence of ammonium sulfate salts. Legkaya Prom. 12, No.1, 28-30 '52. (MLRA 4:12) (CA 47 no.19:10257 '53)

15 9202

27386

S/171/61/014/003/003/004  
E142/E435

**AUTHORS:** Lebedev, N.S., deceased and Lyubimova, A.N.  
**TITLE:** Investigations on the microstructure of emulsion polychloroprene (Nairit) by ozonization (The effect of the polymerization temperature on the chain structure)

**PERIODICAL:** Akademiya nauk Armyanskoy SSR. Izvestiya. Khimicheskiye nauki, v.14, no.3, 1961, pp.243-253

**TEXT:** The process temperature is one of the most important parameters during the polymerization of dienes in general, and during the emulsion polymerization of chloroprene in particular it affects many of the properties of the synthetic polychloroprene rubber Nairit when produced on an industrial scale by emulsion polymerization. The process temperature affects, for example, the rate and the degree of crystallization, the tensile strength, plasticity, solubility, and physical and mechanical properties of the vulcanizates. This is mainly due to variations in the microstructure of the polychloroprene macromolecules and is closely connected with the distribution of the monomer links in the polymer-chains and the character of the bonds between the chains  
Card 1/4

27386

S/171/61/014/003/003/004

E142/E435

Investigations on the micro-

and the individual atoms. W. Carothers (Ref. 7: J. Am. Chem. Soc. 53, 4203 (1931)) and A. L. Klebanskiy (Ref. 8: ZhOKh 6, 359 (1936) and Ref. 9: ZhOKh 17, 941 (1947)) carried out investigations on the association of the monomer-links during the mass polymerization of chloroprene but the present authors were unable to trace any literature data on the micro-structure of Nairit; these data are of great practical interest, especially in connection with low-temperature rubbers. The structure of Nairit was determined by the ozonization method (first described by Harries in 1929) in order to define the relation between the polymerization temperature and the linear structure of the chains and the effect of the disruption of the regularity of addition of the monomer-links on the properties of Nairit. The method is based on the addition of ozone to the unsaturated bonds between the C-atoms, the formation of an ozonide which is subsequently decomposed and the analysis of the decomposition products. Experiments showed that an increase in the polymerization temperature caused a disruption of the regularity of the structure of 1,4-polychloroprene which leads to the formation of considerable quantities of 1,2- and possibly

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S/171/61/014/003/003/004  
E142/E435

Investigations on the micro-

3,4-structures; this affects considerably the processing and technological properties of the Nairit rubbers. The number of chains in the 1,2- and 3,4-position was found to increase from 3.94 to 8.30% when the polymerization temperature was raised from 10 to 50°C; the number of 1,4-chains to 1,2- (3,4-)chain decreased correspondingly. The ozonization process was carried out at a temperature of -20°C; 10 g of Nairit was subjected to this process for 12 to 14 hours. The disruption of the regularity of the structure of the chain has an adverse effect on the properties of polychloroprene, i.e. on the physico-chemical as well as on the physico-mechanical properties of the polymers. On increasing the polymerization temperature, harder, less soluble products are obtained; the polymers show a lower degree of crystallization. The rate of vulcanization of Nairit also depends on the polymerization temperature as the rate of S-free vulcanization is determined by the content of tertiary Cl-atoms in the chain which are formed in the 1,2-position. On comparing the obtained data on the total content of 1,2- and 3,4-chains in Nairit with results obtained by G.T.Maynard and W.E.Mochel (Ref.3 J. Polymer Sci. 13, 69, 235 (1954)) for neoprene latexes, it was found that the ratio of  
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S/171/61/014/003/003/004  
E142/E435

Investigations on the micro-

1,4- to 1,2- (3,4-) chains is also affected to an appreciable degree by the composition of the rubbers. There are 1 figure, 3 tables and 15 references: 5 Soviet and 10 non-Soviet. The four most recent references to English language publications read as follows: Ref.3: as typed in text;

Ref.5: D.W.Fraga, J.Polymer Sci. 41, 138, 522 (1959).

Ref.10: D.E.Andersen, P.Kovacic, Ind. Eng. Chem. 47, 1 (1955)

Ref.11: E.P.Hartsfield, Rubber and Plastics Age 38, 11, 970 (1957).

ASSOCIATION: Yerevanskiy filial VNIISK  
(The Yerevan Branch VNIISK)

SUBMITTED: February 27, 1961

Card 4/4

S/171/62/015/001/001/001  
E075/E136

AUTHORS: Lebedev, N.S. (deceased), Boshnyakov, I.S., and  
Lyubimova, A.N.

TITLE: Determination of the composition of copolymers of  
chloroprene with chlorisoprene by the method of  
ozonization

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya. Khimicheskiye  
nauki. v.15, no.1, 1962, 39-43

TEXT: The paper reports the results of the investigation of  
the composition of chloroprene-chloroisoprene copolymers in  
relation to the concentration of chloroisoprene in the starting  
mixture of monomers and depth of conversion of the monomers.  
The polymers were subjected to ozonolysis with the subsequent  
determinations in the ozonolysis products of levulinic acid,  
equivalent to the content of chloroisoprene in the polymer chain.  
The quantity of succinic and formic acids permitted evaluation of  
the number of chloroprene sections. It was shown that for  
introduction into the monomer mixture of 5% of chloroisoprene, the  
latter almost completely enters into the composition of the  
Card 1/2

Determination of the composition.... S/171/62/015/001/001/001  
E075/E136

copolymer. When the concentration of chloroisoprene in the mixture increases from 5% to 60%, the coefficient of its utilization in the polymer decreases from 94% to 52%. For the mixture containing 10% of chloroisoprene polymerized to different depths (50% to 90%), the coefficient of chloroisoprene utilization remained constant at 84% for all the samples, which indicated the independence of the ratio of monomer units in the polymer from the depth of polymerization. Combination of monomer sections in positions 1,2 and 3,4 in the copolymer is approximately the same as in chloroprene polymer and constitutes on average 10% of all sections in the copolymer chain. There are 2 figures and 2 tables.

ASSOCIATION: Yerevanskiy filial VNIICK  
(Yerevan branch VNIISK)

SUBMITTED: ● October 5, 1961

Card 2/2

KARAPETYAN, N.G.; TARKHANYAN, A.S.; LYUBIMOVA, A.N.

Hydration of vinylacetylene to methyl vinyl ketone by means of  
sulfuric acid solutions of cuprous oxide. Part 1: Solubility  
of vinylacetylene in sulfuric acid solutions of cuprous oxide.  
Izv. AN Arm.SSR,Khim.nauki 17 no.4:398-406 '64.

(MIRA 18:6)

1. Yerevanskiy filial Vsesoyuznogo nauchno-issledovatel'skogo  
instituta sinteticheskogo kauchuka im. akad. S.V.Lebedeva.