LEVIN, A.M.; BRYUKHANOV, O.N.

Testing infrared gas burners. Gaz.prom. 6 no.7:18-19 '61.
(MIRA 17:2)

LEVIN, A.M.; BRYUKHANOV, O.N.

Flame stability in relation to backfire in gas burners. Gaz. prom. 7 no.9:21-24 '62. (MIRA 17:8)

LEVIN, A.M.; BRYUKHANOV, O.N.

Investigating infrared-radiation gas burners operating on coke-oven gas. Gaz. prom. 8 no.12:20-22 '63 (MIRA 18:2)

LEVIN, A.M., kand. tekhn. nauk; BRYUKHANOV, O.N., mladshiy nauchnyy sotrudnik; MOLCHANOVA, T.A., mladshiy nauchnyy sotrudnik; OKSYUTA, G.M., mladshiy nauchnyy sotrudnik; KHAYKINA, M.A., mladshiy nauchnyy sotrudnik

Temperature regimes and spectral characteristics of infrared gas burners. Ispol'. gaza v nar. khoz. no.2:53-70 '63. (MIRA 18:9)

1. Laboratoriya bytovykh gazovykh priborov Saratovskogo gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta po ispol'zovaniyu gaza v narodnom khozyaystve.

L 42829-66 EWT(1)/EWP(e)/EWT(m)/T WW/JW/WE/WH

ACC NR: AR6010522 SOURCE CODE: UR/0196/65/000/010/T005/T005

AUTHOR: Levin, A. M.; Bryukhanov, O. N.

TITLE: Problems of combustion stability

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 10T36

REF SOURCE: Sb. Ispol'z. gaza v nar. kh-ve. Vyp. 3. Saratov, 1965, 116-169

TOPIC TAGS: combustion chamber wall temperature, flame propagation, gas flow, fluid flow, flow velocity, combustion mixture

ABSTRACT: Experiments have been performed to determine the value of the critical velocity gradient of the flow of a gas-water mixture and to study the influence of the wall temperature of the flame channel on the conditions of the origin of a flame jump (FJ) into brass tubes 6, 8, and 12 mm in diam. Investigations were performed on the limits of FJ through apertures of ceramic plates with the aim of establishing the mechanisms of the origin of FJ in flame channels of small diameter. Determinations were made of the most efficient dimensions of apertures in IR radiation burners. A method is presented for determining the possibility of the appearance of FJ during the heating-up of the flame channel walls. The influence of the configuration of the flame channels on the FJ was investigated. [Translation of abstract] 56 illus-

Card 1/2 UDC: 662.6

L 42829-66

ACC NR: AR6010522

trations and bibliography of 27 titles. V. Speysher

SUB CODE: 21

Card 2/2

L 02318-67 EWT(1)/T IJP(c)

ACC NR: AR6016569 SOURCE CODE: UR/0196/65/000/012/T019/T019

AUTHOR: Levin, A. M.; Bryukhanov, O. N.

TITLE: Effect of radiative reflux from a heated component on the operating stability of infrared gas burners

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 12T75

REF SOURCE: Sb. Ispol'z. gaza v nar. kh-ve. Vyp. 3. Saratov, 1965, 170-174

TOPIC TAGS: IR radiation, IR source, radiation effect, radiative heating

ABSTRACT: The authors study the effect which radiative reflux from the article being heated has on the warm-up of ceramic plates and the operating stability of infrared heaters. Natural gas was used in the tests. The specimen used for heating was a 1 mm plate made from grade 3 steel. Ceramic plates perforated with holes 1.55 mm in diameter were tested. The results of the study show that an increase in the heat radiated by the specimen and an increase in the temperature to which the plate is heated results in the possibility of flame breakthrough and reduces the reliability of infrared burner operation. Radiative reflux during drying and other types of low-temperature treatment has no effect on the stability of burner operation. 3 illustrations, bibliography of 4 titles. [Laboratory of Gas Devices]. L. Tragova. [Translation of abstract]

SUB CODE: 13, 20

Card 1/1 UDC: 662.951.2

26688
S/056/61/041/005/003/038
B104/B108

J4,7400 (1055,1160,1555)

AUTHORS: Delyagin, N. N., Shpinel', V. S., Bryukhanov, V. A.

TITLE: Resonance absorption of 23.8 kev γ-quanta by Sn^{119} nuclei in crystals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1347-1358

TEXT: The resonance absorption of 23.8-kev γ-quanta by Sn^{119} nuclei in SnO_2, SnO, β-Sn, and $SnNb_3$ crystals was studied. Sn^{119m} in SnO_2 was used as gamma source. The authors derived the formula

$$\varepsilon(v) = \varkappa f\left(1 - \frac{1}{\pi}\int_{-\infty}^{+\infty} \frac{\exp[-C/(1+x^2)]}{1+(x+y)^2}\,dx\right), \qquad (5)$$

$$x = \frac{E-E_0}{\Gamma/2}, \quad y = \frac{E_0 v/c}{\Gamma/2}, \quad C = \sigma_0 f' n.$$

which enables them to calculate the shape of the absorption spectrum measured by experiment. Γ is the total width of an absorption level, v the relative velocity between source and absorber, f' is the absorption

Card 1/6

probability of a γ-quantum without recoil, n is the number of atoms on 1 cm^2 of the absorber, x is a parameter determining the contribution of the investigated γ-quanta to the overall counting rate. The line width in the resonance absorption spectrum as a function of the thickness of the absorber is derived from formula (5). This formula is discussed for cases where 1) the source contains nuclei of an isotope, 2) the emission lines are split up, the absorption lines are not split, and 3) the absorption lines are split, too. Because of quadruple interaction, the Sn^{119} ground state is not split (spin 1/2). Consequently the absorption spectrum consists of two lines of equal intensity. The distance between these two lines is $\Delta = \frac{1}{2} e^2 Q q_{zz} (1 + \frac{1}{3}\eta^2)^{1/2}$, where Q is the nuclear quadrupole moment, and η is a parameter of asymmetry. For a given velocity v_0 the unsplit emission line coincides with one of the two components of the split absorption line. Resonance absorption is then

$$\varepsilon(v_0) = xf\left(1 - \frac{1}{\pi}\int_{-\infty}^{+\infty} \frac{\exp\left\{-\frac{C}{2}\left(\frac{1}{1+x^2}+\frac{1}{1+(x+y)^2}\right)\right\}}{1+x^2}\,dx\right), \qquad (11).$$

26688
S/056/61/041/005/003/038
B104/B108

Resonance absorption of ...

The resonance absorption of the compounds mentioned above as a function of the velocity of the absorber relatively to the source was determined at nitrogen and room temperatures with an experimental device shown in Fig. 1. The SnO_2 source was prepared from tin enriched in the Sn^{118} isotope up to 92% and irradiated by thermal neutrons in a reactor. The absorption probability without recoil was determined from the dependence of $\epsilon(v)$ on the absorber thickness. Results are given in the table. The calculation of f' is possible if the phonon spectrum of a real crystal is known. Calculation of f' in Debye approximation is discussed. F. L. Shapiro (UFN, 72, 685, 1960), V. A. Lyubimov, A. I. Alikhanov (Izv. AN SSSR, seriya fiz., 24, 1076, 1960), K. P. Mitrofanov, V. S. Shpinel' (ZhETF, 40, 983, 1961), and Yu. M. Kagan are mentioned. The authors thank N. Ye. Alekseyevskiy for valuable discussions. There are 7 figures, 1 table, and 20 references: 7 Soviet and 13 non-Soviet. The 3 most recent references to English-language publications read as follows: W. Visscher, Ann. of Physics, 9, 194, 1960; H. J. Lipkin, Ann. of Physics, 9, 332, 1960; S. De Benedetti, G. Lang, R. Ingalls, Phys. Rev. Lett., 6, 601, 1961.

Card 3/6

Resonance absorption of ...

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: April 27, 1961

Fig. 1. Experimental device. Legend: 1) Pulley; 2) cam; 3) contact disk of the amplitude modulation device; 4) holder for absorber; 5) source; 6) palladium filter; 7) lead collimator; 8) low temperature vessel; 9) absorber; 10) lead collimator; 11) NaI(Tl) crystal; 12) photomultiplier.

S/128/61/000/003/004/008
A054/A127

AUTHORS: Levin, A. M., and Bryukhanov, O. N.

TITLE: Drying cores by means of infra-red gas burners

PERIODICAL: Liteynoye proizvodstvo, no. 3, 1961, 10

TEXT: In drying small-size cores, tests were made to replace the electric infra-red lamps by infra-red gas burners, (ГИИ-3 /GII-3/ type, 400 l/h capacity, 3,320 kcal/h temperature load, 57 - 60% of the total radiation heat produced by the burners is reflected from ceramic plating heated to 800-900°C). Infra-red gas burners are more reliable than electric lamps and have also a higher radiation capacity (9 kcal/sq cm), while the drying costs are reduced 6 - 10 times. However, when placing the test specimen (made of sand-clay mix, with a 8.5% humidity content, and D = 66 mm, H = 22 mm) at a distance of 200 mm from the burners, under a gas pressure of 156 - 172 mm water column, with a surface temperature of 220°C, for a period of 20 minutes, the core center was not dried. Upon raising drying time, the core-edges got burnt. Better results were not obtained even when

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Drying cores by means of infra-red gas burners

increasing the burner distance to 300 mm. The specimens could be dried completely when a break in radiation was made every 5 - 7 minutes. The drying process took 50 minutes, including interruptions, with a net drying period of 40 minutes. There are 2 figures.

ASSOCIATION: Saratovskiy nauchno-issledovatel'skiy institut "Giproniigaz"
(Saratov Scientific Research Institute "Giproniigaz")

BRYUKHANOV, S.

Constructive cooperation. Sov.profsoiuzy 5 no.7:23-27 Jl '57.
(MLRA 10:8)

1.Predsedatel' zavkoma profsoyuza Sumskogo ordena Lenina mashinostroitel'nogo zavoda imeni Frunze.
(Sumy--Machinery industry)

BRYUKHANOV, V.; KHALTURIN, A.

Construction on "Novyi Ural" State Farm. Sel'.stroi.11 [i.e.12] no.1:15 Ja '57. (MLRA 10:3)

1. Direktor sovkhoza "Novyy ural" Chelyabinskoy oblasti (for Bryukhanov) 2. Sekretar' partiynoy organizatsii(for Khalturin).
(Chelyabinsk Province--Construction industry)

BRYUKHANOV, V.A., inzhener; KARPINSKIY, V.I., inzhener; VYSOTIN, Yu.G., inzhener.

The high degree of general mechnization in the One-Chuna Forest Industry Establishment. Mekh trud.rab. 10 no.1:20-24 Ja '56. (MLRA 9:5)

(Krasnoyarsk Territory--Lumbering--Machinery)

PHASE I BOOK EXPLOITATION SOV/3682

Bryukhanov, Valentin Andreyevich

Mirovozzreniye K. E. Tsiolkovskogo i yego nauchno-tekhnicheskoye tvorchestvo (K. E. Tsiolkovskiy's Philosophy and His Scientific and Technological Work) Moscow, Sotsekgiz, 1959. 170 p. 20,000 copies printed.

Ed.: A. Arsen'yev; Tech. Ed.: L. Ulanova.

PURPOSE: This book is intended for the general reader.

COVERAGE: The book is based on Tsiolkovskiy's published writings and unpublished documents. It was originally planned as the dissertation of the late author. The book gives a brief account of Tsiolkovskiy's scientific and technical activities and an apprasial of his work. There are no references.

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K. E. Tsiolkovskiy's Philosophy (Cont.) SOV/3682

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Ch. II. Methodological Problems of Science and Technology in the Creative Work of K. E. Tsiolkovskiy. His Contribution to Technical Progress 64

Ch.III. The Philosophical Significance of K. E. Tsiolkovskiy's Works on Space Rockets 113

Ch. IV. K. E. Tsiolkovskiy's Criticism of Some Varieties of "Physical" Idealism 137

Brief Conclusion 167

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Card 2/2

BRYUKHANOV, V. A.

82612

S/056/60/039/001/028/029
B006/B063

24.6520

AUTHORS: Delyagin, N. N., Shpinel', V. S., Bryukhanov, V. A., Zvenglinskiy, B.

TITLE: The Hyperfine Structure of γ-Rays of ^{119} Produced by Quadrupole Interaction in the Crystal Lattice

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1(7), pp. 220-222

TEXT: In the introduction to this article the authors describe several publications dealing with the above-mentioned subject. A. I. Alikhanov and V. A. Lyubimov (Ref. 5) studied the resonance absorption of 23.8-kev gamma quanta of Sn^{119} nuclei. The authors themselves studied the hyperfine structure of the 23.8-kev level of this nucleus. The hyperfine structure is due to the interaction between the quadrupole moment of the nucleus in the excited state and the internal electric field of the tin crystal. Metallic Sn^{119m} served as source, which moved relative to the absorber. Contrary to similar experiments, the source used here

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The Hyperfine Structure of γ-Rays, Produced by Quadrupole Interaction in the Crystal Lattice

S/056/60/039/001/028/029
B006/B063

underwent linear acceleration within certain limits. Measurements were carried out at the temperatures of liquid nitrogen. The X-radiation of tin (26 kev) was almost completely absorbed by a palladium film 0.06 mm thick. The γ-quanta passing through this filter were recorded by means of an NaI(Tl) crystal. The pulses coming from the single-channel pulse-height analyzer were linearly phase-modulated in a radio device, viz. simultaneously with the changes in the source velocity. The modulated pulses were fed into a 100-channel pulse-height analyzer of the type АИ -100 (AI-100). Each channel corresponded to a certain velocity of the source. The measurements were made with two absorbers containing Sn^{119}, namely, metallic tin and $SnNb_3$ alloy. The dependence of resonance absorption on the velocity of the source for a tin specimen 20 mg/cm^2 thick is shown in the upper part of the Fig. on p. 221. The curve has three peaks at 0 and ±1.46 mm/sec (velocity of the source). This corresponds to a hyperfine structure of the 23.8-kev level, and is explained by the interaction between the quadrupole moment of the nucleus in the excited state (spin 3/2) and the electric field of the crystal.

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82612

The Hyperfine Structure of γ-Rays, Produced by Quadrupole Interaction in the Crystal Lattice

S/056/60/039/001/028/029
B006/B063

This interpretation is confirmed by measurements with the $SnNb_3$ absorber (30 mg/cm^2), which are illustrated in the lower part of the Fig. The spacing Δ of the components of the hyperfine structure was $\Delta = (eQ/2)\partial^2V/\partial z^2 = (1.15\pm0.25)\cdot10^{-7}$ev. There are 1 figure and 6 references: 2 Soviet, 2 German, and 2 US.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: May 25, 1960

Card 3/3

84972

S/056/60/039/003/058/058/XX
B006/B070

24.6210

AUTHORS: Delyagin, N. N., Shpinel', V. S., Bryukhanov, V. A., Zvenglinskiy, B.

TITLE: Nuclear Zeeman Effect in Sn^{119}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 894 - 895

TEXT: The present "Letter to the Editor" is the continuation of a previous paper (Ref.4) in which the authors reported on measurements of the dependence of resonance absorption of 23.8-kev gamma quanta emitted in the Sn^{119m} decay on the velocity of the source relative to the absorber. The authors have again carried out analogous measurements, but this time the absorber was placed in an external constant magnetic field. In this case, a Zeeman splitting of the absorption line took place, and a hyperfine splitting was observed in the spectrum, from which the magnetic moment of the excited 23.8 kev level of Sn^{119} could be determined. The

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Nuclear Zeeman Effect in Sn^{119}

S/056/60/039/003/058/058/XX
B006/B070

gamma source was a foil of white metallic tin (94% of Sn^{118}) exposed to thermal neutron irradiation in a reactor. The absorber was $SnNb_3$ in which no quadrupole splitting of the 23.8 kev level takes place according to Ref. 4. Thus, the observed hyperfine splitting of the absorption line is only a consequence of the Zeeman effect. For the measurements, the source and the absorber were cooled to nitrogen temperature. The absorber (20 mg/cm^2 $SnNb_3$) was placed between the pole pieces of a magnet producing a constant magnetic field of 12,150 oe in the absorber, and the measurements were made with and without a magnetic field. The ground level is split in two and the excited one (3/2) in four sublevels under the action of the field. 6 M1 transitions are possible between these. By changing the velocity of the source (positive and negative velocity) 12 lines must be observable. The shape of the absorption spectrum is dependent on the magnetic moments $|\mu_0|$ and $|\mu|$ of the ground and excited states of the Sn^{119} nucleus; on the relative signs of these moments; and on the quadrupole splitting Δ of the excited state. The results of the measurements are represented in a diagram

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Nuclear Zeeman Effect in Sn^{119} S/056/60/039/003/058/058/XX
B006/B070

(ordinate : counting rate; abscissa : velocity of the source and the corresponding energy shift). The distance between the hyperfine structure components was determined from the spectral measurement to be $\Delta = (1.2\pm0.2).10^{-7}$ev. This is in good agreement with the value obtained in Ref. 4. From the positions of the three maxima, μ_o was found to be $-(1.1\pm0.3)$ muclear magnetons and the moment of the 23.8 kev level to be $\mu = +(1.9\pm0.4)$ nuclear magnetons. This value is considerably higher than that given by the single-particle model. A. I. Alikhanov and V. A. Lyubimov are mentioned. There are 1 figure and 5 references: 3 Soviet, 1 German, and 1 French.

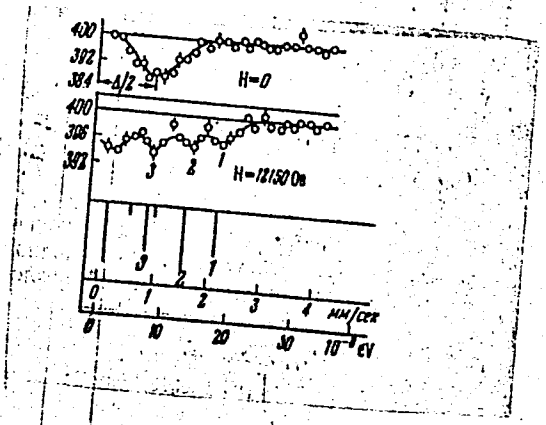
ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: July 4, 1960

Card 3/4

84972

S/056/60/039/003/058/058/XX
B006/B070



Card 4/4

S/076/61/035/001/012/022
B004/B060

AUTHORS: Cherneva, Ye. P., Barabanov, S. R., Bryukhanov, V. A., Pashkov, A. B., and Tunitskiy, N. N. (Moscow)

TITLE: Change in the selectivity of monofunctional sulfonated cation exchangers as a function of the concentration of initial electrolyte solutions and the charges of exchanging ions

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 1, 1961, 189-191

TEXT: The authors wanted to study the selectivity of the sulfonated cation exchanger of the type КУ-2 (KU-2). The exchanger was obtained by copolymerization of styrene with divinyl benzene and the subsequent sulfonation by means of chloro sulfonic acid. In H form, this resin is a polyacid, while in salt form it is a polyelectrolyte, whose anions are strongly bound to the resin, and whose cations are mobile. The following aspects were investigated through a study of the equilibrium of ion exchange: a) the dependence of selectivity on the exchanger capacity; b) the dependence of selectivity on the cross linking; c) on the initial

concentration of the electrolytes, d) on the valence of exchanging ions. The weighed-in portion of dried resin was shaken for 35-40 hours at room temperature with an exactly known volume of an electrolyte solution of a known concentration, and the concentration of the components in the solution was then determined. A resin with equal cross linking (7%), but different capacity (0.18 mg-equiv/l and 4.63 mg-equiv/l) was taken for the $RH^+ - Ca^{2+}$ system. The coefficient of selectivity was calculated by B. P. Nikol'skiy's equation:

$K = (N_{Ca}^{1/2}/n_{Ca}^{1/2})(n_H/N_H)$. N, n are the equivalent portions of cations in resin and in solution, respectively. The following results were obtained for resin with the capacity 0.18 mg-equiv/l: for 0.895 N $CaCl_2$ $K = 0.35\pm0.1$; for 1.90 N $CaCl_2$ $K = 0.12\pm0.03$. For resin with a capacity 4.63 mg-equiv/l, K amounted to 8.99 ± 0.82 for the first mentioned concentration of $CaCl_2$, and 4.75 ± 0.07 for the second concentration. Resin, cross-linked with 7% and resin with 24% divinyl benzene displayed no change of selectivity in the $RH^+ - Na^+$ system. Resin with 7% cross linking displayed

on a rising concentration of the external solution a reduced selectivity in the $RH^+ - Na^+$ and $RH^+ - La^{3+}$ systems. With constant specific loading, capacity, and cross linking, selectivity increased with the valence of the ion charge. There are 1 figure, 2 tables, and 11 references: 3 Soviet-bloc and 7 non-Soviet-bloc.

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

SUBMITTED: May 13, 1959

BRYUKHANOV, V.A.; DELYAGIN, N.N.; ZVENGLINSKIY, B.; SHPINEL', V.S.

Energy shift of gamma-ray transition observed in the resonance absorbtion of γ-quanta in crystals. Zhur. eksp. i teor. fiz. 40 no.2:713-714 F '61. (MIRA 14:7)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

(Gamma rays)

DELYAGIN, N.N.; SHPINEL', V.S.; BRYUKHANOV, V.A.

Resonance absorption of 23.8 Kev. γ-quanta by Sn^{119} nuclei in crystals. Zhur. eksp. i teor. fiz. 41 no.5:1347-1358 N '61. (MIRA 14:12)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

(Quantum theory) (Tin) (Crystal lattices)

SHPINEL', V.S.; BRYUKHANOV, V.A.; DELYAGIN, N.N.

Isomeric energy shifts in the 23.8 Kev. gamma-transition in the Sn^{119} nucleus. Zhur. eksp. i teor. fiz. 41 no.6:1767-1770 D '61. (MIRA 15:1)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Gamma-ray spectrometry) (Tin)
(Isomerism)

S/120/62/000/001/003/061
E032/E514

AUTHORS: Bryukhanov, V.A., Delyagin, N.N., Zvenglinskiy, B., Sergeyev, S.A. and Shpinel', V.S.

TITLE: Measurement of the resonance absorption spectra of gamma-rays in crystals

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1962, 23-28

TEXT: In a previous paper (Ref.5: Zh.eksperim. i teor.fiz., 1960, 39, 220; Ibid 40, 713) the authors described an apparatus which was used to investigate the Mössbauer effect (23.8 kV gamma-rays on Sn^{119} nuclei in crystals). In this apparatus the relative velocity of the source and the absorber is varied linearly with time with the aid of a mechanical device and the intensity of the gamma-rays corresponding to different values of this velocity is recorded with a multi-channel kicksorter and an amplitude modulator working in synchronism with the device producing the above velocity variation. In the present note the authors give a more detailed description of the apparatus, including both the mechanical and the electronic parts of it. A typical absorption spectrum for a SnO_2 crystal (9 mg/cm^2 target

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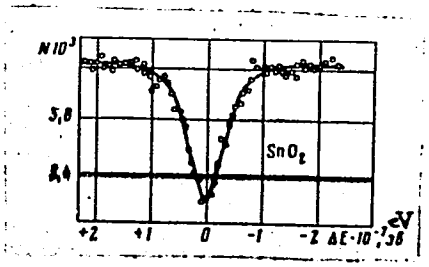
and 6 mg/cm^2 source, both at room temperature) is shown in Fig.6. It is reported that the width of the 23.8 keV excited state of Sn^{119} is (2.6 ± 0.25) x 10^{-8} eV. There are 6 figures.

ASSOCIATION: Institut yadernoy fiziki MGU
(Institute of Nuclear Physics MGU)

SUBMITTED: June 15, 1961

Fig.6

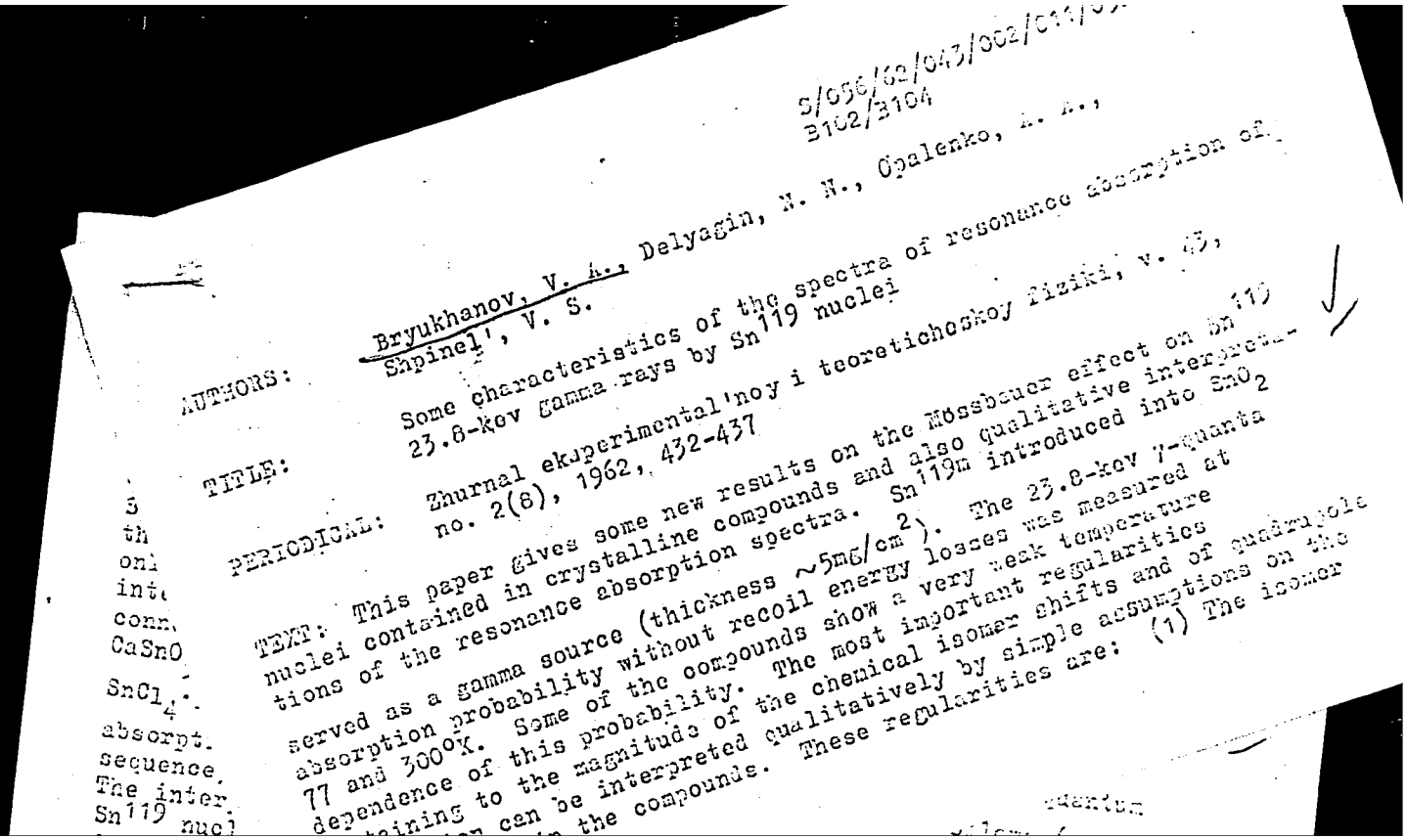


Card 2/2

BRYUKHANOV, V.A.; GOL'DANSKIY, V.I.; DELYAGIN, N.N.; MAKAROV, Ye.F.; SHPINEL', V.S.

Observation of the Mössbauer effect in a tin-containing polymer. Zhur. eksp. i teor. fiz. 42 no.2:637-639 F '62. (MIRA 15:2)

1. Institut khimicheskoy fiziki AN SSSR i Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Polymers)(Gamma-ray spectrometry)



S/056/62/043/002/011/0[illegible]
B102/B104

AUTHORS: Bryukhanov, V. A., Delyagin, N. N., Opalenko, L. A., Shpinel', V. S.

TITLE: Some characteristics of the spectra of resonance absorption of 23.8-kev gamma rays by Sn^{119} nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 432-437

TEXT: This paper gives some new results on the Mössbauer effect on Sn^{119} nuclei contained in crystalline compounds and also qualitative interpretations of the resonance absorption spectra. Sn^{119m} introduced into SnO_2 served as a gamma source (thickness ~5mg/cm^2). The 23.8-kev γ-quanta absorption probability without recoil energy losses was measured at 77 and 300°K. Some of the compounds show a very weak temperature dependence of this probability. The most important regularities pertaining to the magnitude of the chemical isomer shifts and of quadrupole [illegible] can be interpreted qualitatively by simple assumptions on the [illegible] the compounds. These regularities are: (1) The isomer

S/056/62/043/002/013/033
B102/B104

AUTHORS: Bryukhanov, V. A., Gol'danskiy, V. I., Delyagin, N. N., Korytko, L. A., Makarov, Ye. F., Suzdalev, I. P., Shpinel', V. S.

TITLE: Peculiarities of Mössbauer spectra of organo-tin compounds and the role of the nearest chemical bonds in the Mössbauer effect

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 448-452

TEXT: In continuation of their studies on the Mössbauer effect in organo-tin compounds (ZhETF, 42, 637, 1962), the authors determined a Mössbauer effect in the resonance absorption of 23.8-kev gamma-quanta by Sn^{119} nuclei. Many examples, e.g. $Sn(C_6H_5)_4$, $SnCl_4$ on the one hand, and $Sn(C_6H_5)_iCl_{4-i}$ (i=1,2,3) on the other, show that in compounds with four identical substituted groups the Mössbauer lines appear as the usual singlet, whereas with different substituted groups (R_iSnX_{4-i}) a distinct doublet occurs. The two lines differ in width and intensity, depending

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on the ratio of R to X. In amorphous media, e.g. in stanniferous glass, the Mössbauer effect was observed for the first time. The glass composition was the following: SnO_2-9.1%; SiO_2-61.3%; B_2O_3-18.5%; Al_2O_3-3.2%; Na_2O-7.9%. The spectra of crystalline $Sn(C_6H_5)_4$ and its solid solution in polymethylmethacrylate and of crystalline $Sn(C_2H_5)_2Cl_2$ and of its 20 % solution in dichloroethane are identical. Some of the data obtained indicate that the decisive factor determining the shape of the Mössbauer spectra (isomer shift and quadrupole splitting) are the molecular bonds closest to the tin nucleus. There are 3 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: April 12, 1962

Stapled card being return.

S/056/62/043/002/011/053
B102/B104

AUTHORS: Bryukhanov, V. A., Delyagin, N. N., Opalenko, A. A., Shpinel', V. S.

TITLE: Some characteristics of the spectra of resonance absorption of 23.8-kev gamma rays by Sn^{119} nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 432-437

TEXT: This paper gives some new results on the Mössbauer effect on Sn^{119} nuclei contained in crystalline compounds and also qualitative interpretations of the resonance absorption spectra. Sn^{119m} introduced into SnO_2 served as a gamma source (thickness $\sim 5 mg/cm^2$). The 23.8-kev γ-quanta absorption probability without recoil energy losses was measured at 77 and 300°K. Some of the compounds show a very weak temperature dependence of this probability. The most important regularities pertaining to the magnitude of the chemical isomer shifts and of quadrupole interaction can be interpreted qualitatively by simple assumptions on the chemical bond in the compounds. These regularities are: (1) The isomer

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Some characteristics of the spectra...

shift in tetravalent tin compounds increases from SnO_2 to SnI_4 with decreasing electro-negativity of the element (sequence: F, O, Cl, Br, S, I). (2) The isomer shift of the bivalent compounds is much larger than that of the tetravalent ones. (3) A quadrupole line splitting was only observed with the bivalent tin compounds. (4) The quadrupole interaction decreases with decreasing electro-negativity of the element connected with the tin. The following compounds were investigated: $CaSnO_3$, $SrSnO_3$, $BaSnO_3$, SnO_2, SnS_2, SnO, $(NH_4)_2SnCl_6$, SnF_2, β-Sn, $SnCl_4 \cdot 5\,H_2O$, $SnCl_2 \cdot 2H_2O$, SnI_4, $SnBr_2$, and $Sn(C_6H_5)_4$. The gamma-quantum absorption probability ratios $f'(77^oK)/f'(300^oK)$ were as follows (same sequence): ~1, ~1, ~1, 1.25, 2.8, 2.9, 5.7, 8.5, 6.0, 26, -, -, -, -. The interpretation of the results confirms the assumption that the Sn^{119} nuclear excitation raises the effective radius of the charge distribution (ZhETF, 41, 1767, 1961). There are 2 figures and 3 tables.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of the Moscow State University)

SUBMITTED: March 15, 1962

Card 2/2

S/056/62/042/005/007/050
B125/B108

AUTHORS: Bryukhanov, V. A., Delyagin, N. N., Shpinel', V. S.

TITLE: Magnetic moment of the 23.8-kev excited state of the Sn^{119} nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 5, 1962, 1183 - 1185

TEXT: The nuclear Zeeman effect on Sn^{119} was investigated by the method of Moessbauer absorption, using SnO_2 as a gamma source, and tin-iron as well as tin-manganese (Mn_2Sn) alloys as absorbers. Resonance absorption spectra with well-resolved components of magnetic splitting were obtained for Mn_2Sn and also for tin-iron alloys with a tin content of up to 10%. The magnetic moment was measured on tin-iron alloys containing 1.7% tin (enriched up to 75% with Sn^{119}), while cooling the absorber with liquid nitrogen. All six spectral components were well resolved; their intensities agreed with those expected for an unpolarized absorber. It follows from the data collected in the table: $\mu_0 H = 2.80 \pm 0.06$ mm/sec and

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Magnetic moment of the...

S/056/62/042/005/007/050
B125/B108

$\mu H = 2.02 \pm 0.07$ mm/sec ($\mu_0 = -1.041$ of the nuclear magneton, μ_0 and μ denote the magnetic moments of the ground state and of the excited state of the Sn^{119} nucleus, respectively, H is the mean field strength). The isomeric shift of the absorption line in the alloy is $+1.36 \pm 0.04$ mm/sec. The magnetic field acting upon the tin nuclei in the alloy is 68 ± 2 koe. This internal magnetic field depends on the composition of the alloy. There are 1 figure and 1 table. The most important English-language reference is: O. C. Kistner, A. W. Sunyar, T. B. Swan. Phys. Rev., 123, 179, 1961.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: December 15, 1961

Card 2/2

BRYUKHANOV, V.A.; DELYAGIN, N.N.; SHPINEL', V.S.

Magnetic moment of the excited state of the Sn^{119} nucleus at an energy of 23.8 Kev. Zhur. eksp. i teor. fiz. 42 no.5: 1183-1185 My '62. (MIRA 15:9)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Tin--Magnetic properties) (Quantum theory)

BRYUKHANOV, V.A.; DELYAGIN, N.N.; OPALENKO, A.A.; SHPINEL', V.S.

Some characteristics of the spectra of resonance absorption of 23.8 Kev. γ-rays by Sn^{119} nuclei. Zhur. eksp. i teor. fiz. 43 no.2:432-437 Ag '62. (MIRA 16:6)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Gamma rays—Spectra) (Tin)

BRYUKHANOV, V.A.; GOL'DANSKIY, V.I.; DELYAGIN, N.N.; KORYTKO, L.A.; MAKAROV, Ye.F.; SUZDALEV, I.P.; SHPINEL', V.S.

Characteristics of Mössbauer spectra of tin organic compounds and the role of the nearest chemical bonds in the Mössbauer effect. Zhur. eksp. i teor. fiz. 43 no.2:448-452 Ag '62. (MIRA 16:6)

1. Institut khimicheskoy fiziki AN SSSR.
(Mössbauer effect) (Tin compounds)

BRYUKHANOV, V. A., DELYAGIN, N. N., KAGAN, YU. M.,

"The Mossbauer Effect of Sn^{119} in Vanadium, Gold, Platinum and Thallium,"

report presented at the 3rd Intl. Conf. on the Mossbauer Effect, Cornell, Univ., New York, 4-7 Sep 63.

ACCESSION NR: AP4012533 S/0056/64/046/001/0137/0141

AUTHORS: Bryukhanov, V. A.; Delyagin, N. N.; Kuz'min, R. N.

TITLE: Resonance absorption of gamma quanta in magnesium stannide. 23.8-keV absorption line with natural line width

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 137-141

TOPIC TAGS: Mossbauer effect, photon absorption, resonance photon absorption, magnesium stannide, recoilless gamma quantum absorption, magnesium stannide chemical bond, recoilless resonance absorption probability, tin 119, absorption line, absorption line width, natural line width

ABSTRACT: Continuing earlier Mossbauer-effect studies of tin oxides (ZhETF v. 40, 713, 1961 and v. 43, 432, 1962), the authors investigated resonance absorption of 23.8-keV gamma quanta by Sn^{119} nuclei over a temperature range from 77 to 290K in Mg_2Sn, which has a struc-

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ACCESSION NR: AP4012533

ture of high symmetry, so that the electric field gradient at the tin nucleus should be zero. The experiments were also aimed at finding a source of 23.8-keV gamma rays with natural line width. The probability of recoilless absorption of the gamma quanta was found to be 0.77 and 0.28 at 77K and at room temperature, respectively. The width obtained for the absorption line in Mg_2Sn was 0.32 $\pm$ $\pm$ 0.02 mm/sec, which agrees well with the value obtained from the lifetime of the 23.8 keV excited state. In view of the predominant role played in Mg_2Sn by the interaction between the tin and magnesium atoms, the contribution of the optical vibration is considerably reduced for the heavy tin nucleus. In this connection, interest is attached to the study of compounds with structure isomorphic to fluorite ($PtSn_2$ or $IrSb_2$), with metallic bonds, where an increased effect of the optical vibrations for the tin atoms is expected. "The authors thank Yu. Kagan for interesting discussions of

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ACCESSION NR: AP4012533

the results." Orig. art. has: 4 figures and 2 formulas.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 18Jul63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 007 OTHER: 003

Card 3/3

BRYUKHANOV, V.A.; DELYAGIN, N.N.; KAGAN, Yu.

Mossbauer effect on Sn^{119} nuclei in a vanadium matrix. Zhur. eksp. i teor. fiz. 45 no.5:1372-1377 N '63. (MIRA 17:1)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

ACCESSION NR: AP4042372 S/0056/64/047/001/0080/0083

AUTHORS: Bryukhanov, V. A.; Delyagin, N. N.; Shpinel', V. S.

TITLE: Connection between the isomer shifts of the 23.8-keV gamma transition of the Sn-119 nucleus in metallic solid solutions and the dynamic properties of the matrix

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 80-83

TOPIC TAGS: tin, solid solution, isomeric transition, Mossbauer effect, gamma scattering

ABSTRACT: This is a consequence of earlier measurements by the authors (ZhETF v. 45, 1372, 1963 and v. 46, 825, 1964) of the probability of recoilless absorption of 23.8-keV gamma quanta by Sn^{119} nuclei in various metallic matrices, which yielded good agreement with the theory of the Mossbauer effect and showed that the results can be interpreted on the assumption that the force con-

stants are unchanged. In this investigation, the isomer shifts of the 23.8-keV gamma transition of Sn^{119} introduced as an impurity in various metallic matrices were measured. The measurements were made for solid solutions with low tin concentration (1--3 at. %). The data obtained were compared with a parameter proportional to the effective force constant. A simple and unique connection was established between the electron density at the nucleus of the impurity atom and the dynamic characteristics of the host metal (Encl. 02). It is indicated that an explanation of the observed relation entails difficulties in view of the great variety in the properties of the host metals, but several alternate possible explanations are proposed. "The authors are grateful to Yu. Kagan for valuable discussions and also to P. L. Gruzin in whose laboratory some of the alloys were prepared." Orig. art. has: 1 figure, 2 formulas, and 2 tables.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo

ACCESSION NR: AP4042372

universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 13Feb64 ENCL: 02

SUB CODE: NP NR REF SOV: 003 OTHER: 001

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ACCESSION NR: AP4042372 ENCLOSURE: 01

Values of parameter $\Theta_0^2 M_0$, proportional to force constants

Матрица Matrix	δ, мм/сек mm/sec	Θ_0, °K	$\Theta_0^2 M_0 \cdot 10^{-4}$
Ag	+0,20 ± 0,02	210	4,76
Cu	−0,13 ± 0,03	325	6,71
Au	+0,15 ± 0,02	170	5,69
In	+0,96 ± 0,05	129	1,91
Tl	+1,01 ± 0,03	96	1,88
Pb	+1,20 ± 0,05	90	1,68
V	−0,27 ± 0,04	390	7,74
Pt	−0,42 ± 0,04	220	9,44
Fe	−0,42 ± 0,06	420	9,55
Pd	−0,37 ± 0,03	275	8,04
Sn	+0,69 ± 0,03	170	3,43

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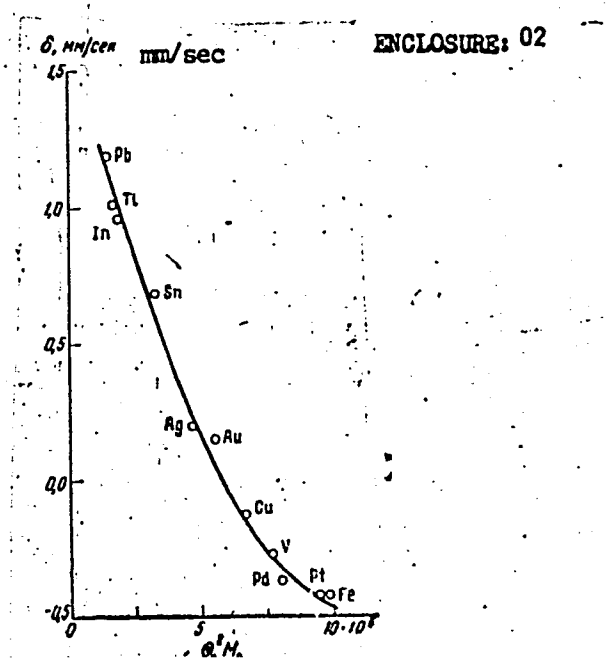
ACCESSION NR: AP4042372

ENCLOSURE: 02

Isomer shifts vs. parameter $\theta_0^2 M_0$



Card 5/5

ACCESSION NR: AP4025912 S/0056/64/046/003/0825/0828

AUTHOR: Bryukhanov, V. A.; Delyagin, N. N.; Kagan, Yu.

TITLE: The Mossbauer effect on Sn-119 nuclei in gold, platinum, and thallium matrices

SOURCE: Zhurnal eksporimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 825-828

TOPIC TAGS: Mossbauer effect, tin 119, gold matrix, platinum matrix, thallium matrix, light Mossbauer atom, vibration spectrum, discrete frequency, recoilless resonant absorption, absorption probability, force constant, alloy concentration effect

ABSTRACT: Following an earlier similar investigation of the Mossbauer effect on Sn^{119} in a vanadium matrix, (ZhETF v. 45, 1372, 1963), the present study was undertaken for the purpose of an absolute comparison of theory and experiment in the case of a light Mossbauer atom, when there are no discrete frequencies in the vibration spectrum. To this end, the probability for recoilless resonant absorption of 23.8-keV gamma rays by Sn^{119} was measured in matrices of gold, platinum, and thallium over a wide range of temperatures. The measurements were made in solid solutions of tin in gold (1.7 and 3.2 at% tin), platinum (1.5 at% tin) and thallium

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ACCESSION NR: AP4025912

(3.6 and 9.2 at% tin). The experimental data were compared with the theoretical results of Yu. Kagan and Ya. A. Iosilevskiy (ZhETF v. 42, 259, 1962), which were obtained under the assumption that a force constant remain unchanged. The agreement obtained for the probability of the effect between the experimental and the theoretical values extends over a whole range of temperatures and is the same, within experimental error, for alloys with different concentrations. Orig. art. has: 1 figure and 1 formula.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 18Jul63 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: PH NO REF SOV: 004 OTHER: 000

Card 2/3

ACCESSION NR: AP4042558 S/0056/64/046/006/1996/2002

AUTHORS: Bryukhanov, V. A.; Delyagin, N. N.; Kuz'min, R. N.; Shpinel', V. S.

TITLE: Mossbauer effect in binary compounds of tin

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 6, 1964, 1996-2002

TOPIC TAGS: Mossbauer effect, tin, tin compound, resonance absorption, phonon, lattice parameter, lattice constant

ABSTRACT: To provide a simple interpretation of the decrease of the effective Debye temperature Θ, which is used to characterize the probability of the Mossbauer effect, with decreasing temperature, in analogy with the explanation of the increase in Θ with decreasing temperature presented by the authors earlier (ZhETF v. 40, 713, 1961), the authors investigated resonance absorption of γ radiation by Sn^{119} nuclei in the binary compounds SnAs, SnSb, SnTe, and SnPt over a

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wide range of temperatures. A simple model of the phonon spectrum, constructed by superposing the Debye and the Einstein spectra, was used in the analysis. The probability of recoil-free absorption and its temperature dependence for all four compounds cannot be described by a single parameter in the Debye approximation. This result is attributed to the influence of the optical branches of the phonon spectrum. The measurements of the absorption line widths, quadrupole interactions, and chemical isomeric shifts are used to analyze the properties of the chemical bonds and the structures of the investigated compounds. The structure and parameters of the lattices were determined by x-ray analysis. Although the experimental results agreed qualitatively with the model, there was no quantitative agreement and the observed temperature dependence of Θ exceeded the predictions based on the considered phonon-spectrum model. "The authors thank A. I. Firov for his assistance." Orig. art. has: 3 figures, 3 formulas and 1 table.

ACCESSION NR: AP4042558

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 17Jan64	DATE ACQ:	ENCL: 02
SUB CODE: SS, NP	NR REF SOV: 007	OTHER: 001

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ACCESSION NR: AP4042558

ENCLOSURE: 01

Principal characteristics of the Mossbauer effect

Соединение 1	Γ_n, мм/сек 2	δ, мм/сек		f		θ, °K	
		77° K	290° K	77° K	290° K	77	290
SnAs	0,34±0,02	0,67±0,03	0,62±0,02	0,50±0,05	0,20±0,02	145±15	180±10
SnSb	0,42±0,04	0,80±0,03	0,76±0,03	0,31±0,03	0,084±0,005	110±6	144±3
SnTe	0,36±0,03	1,51±0,02	1,43±0,03	0,37±0,03	0,070±0,006	120±5	139±3
SnPt	—	−0,22±0,02	−0,30±0,02	0,50±0,06	0,30±0,04	145±15	210±10

1 - Compound, 2 - mm/sec

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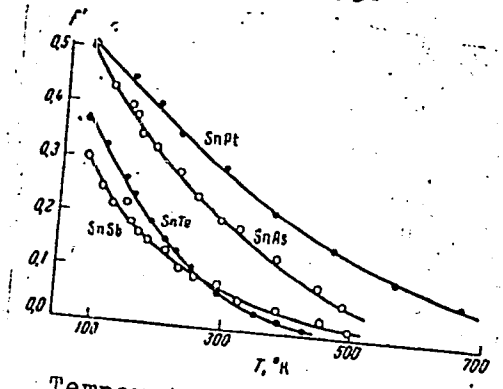
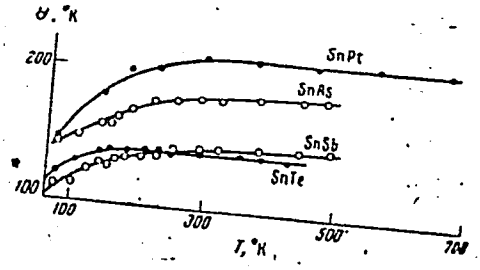
ACCESSION NR: AP4042558

ENCLOSURE: 02





Temperature dependence of recoilless absorption probability (left) and of the effective Debye temperature for the compounds SnAs, SnSb, SnTe, and SnPt

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BRYUKHANOV, V.A.; DELYAGIN, N.N.; SHPINEL', V.S.

Interrelation between the isomer shifts of the 23.8 Kev. γ-transition in the Sn^{119} nucleus in metallic solid solutions and the dynamic properties of the matrix. Zhur. eksp. i teor. fiz. 47 no.1:80-83 Jl '64.

(MIRA 17:9)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

L 22476-65 EWT(1)/EWT(m)/EEC(t)/EWP(b)/T Peb AEDC(a)/AFWL/SSD/ASDA-5/ASMP-2
ASDP-3/ESD3(s)/ESDT IJP(c) JD/JG

ACCESSION NR: AP5001831 S/0056/64/047/006/2085/2090

AUTHOR: Bryukhanov, V. A.; Delyagin, N. N.; Shpinel', V. S.

TITLE: Mossbauer effect on Sn-119 impurity nuclei in binary metallic solid solutions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 6, 1964, 2085-2090

TOPIC TAGS: Mossbauer effect, tin, silver alloy, binary matrix, solid solution, isomer shift, electron density, absorption line

ABSTRACT: Mossbauer effect probabilities and isomeric shifts were measured for the Sn^{119} gamma transition on nuclei incorporated as impurities in Ag-Pd, Ag-Au, and Ag-In binary matrices, as well as in Ag-Sn alloys. The technique of the measurements and of the data reduction were similar to those used by the authors earlier (ZhETF v. 45, 1372, 1963; v. 46, 825, 1964; v. 46, 137, 1964). The dependence on the composition of the binary matrix of the electron density at the nucleus, and the effective Debye temperature, which characterizes the probability of the effect, were found over a wide range of concentrations. It is shown that

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both the Mossbauer-effect probability and the size of the isomeric shift (as well as the width of the absorption line) are extremely sensitive to features of the electron structure of the host; in particular, the dependence found for the hosts containing a transition metal (palladium) is markedly different from that observed for other matrices. Some feature of the behavior of other impurity atoms in metal hosts are discussed. "The authors thank Yu. Kagan for valuable discussion of the results." Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics, Moscow State University).

SUBMITTED: 18Jul64 ENCL: 00

SUB CODE: SS, MM NR REF SOV: 004 OTHER: 005

BATURIN, V.V., glav. red.; BRYUKHANOV, V.N., red.; TSIKKEL', L.M., red.VOSKRESENSKIY, Ye.N., red.; IL'INA, N.S., red.; LEONOV, B.N., red.; LUNGERSGAUZEN, G.F., red.; MINSKAYA, V.M., red.; MORALEV, V.M., red.; RAKOVETS, O.A., red.

[Methods for the interpretation of the materials of aerial photography in geological studies; materials] Metody deshifrirovaniia aerofotomaterialov pri geologicheskikh issledovaniiakh; materialy. Glav. red. V.V.Baturin, V.N. Briukhanov, L.M.TSikkel'. Moskva, Izd-vo "Nedra," 1964. 150 p.

(MIRA 17:7)

1. Vsesoyuznyy seminar po geologicheskomu deshifrirovaniyu pri geologicheskikh issledovaniyakh, Moscow, 1961.

BRYUKHANOV, V.N.; SMIRNOV, L.N.

Secondary transitional disharmonic folds. Trudy VAGT no.2:158-162 '56. (MLRA 10:5)

(Folds (Geology))

BRYUKHANOV, V.N.; KUZ'MIN, Yu.Ya.

Gas prospects in upper Pliocene sediments of the northern Caspian Sea region. Geol. nefti i gaza 4 no.5:20-26 My '60. (MIRA 13:9)

1. Vsesoyuznyy aerogeologicheskiy trest.
(Caspian Sea region--Gas, Natural--Geology)

BRYUKHANOV, V. N., BUKHANEVICH, V. A. and LUNGERSGAUZEN, G. F.

(2)

"Aerial Photography in Geological Explorations in the USSR

report submitted for the United Nations Seminar on Aerial Survey Methods and Equipment, Bangkok, Thailand, 4 January - 5 Feb 1960

BRYUKHANOV, V.N.

Ways of using color aerial photographic materials for geological purposes. Razved. i okh. nedr 28 no.2:9-14 F '62. (MIRA 15:3)

1. Kompleksnaya tematicheskaya aerogeologicheskaya ekspeditsiya.
(Aeronautics in geology) (Photography, Aerial)

BRYUKHANOV, V.N., inzh.

Problems concerning the normalization of the unit consumption of electric power for railroad traction purposes and analysis of factors affecting this consumption. Izv.vys.ucheb.zav.; energ. 4 no.4:45-50 Ap '61. (MIRA 14:5)

1. Irkutskiy finansovo-ekonomicheskiy institut. Predstavlena kafedrami vysshey matematiki i fiziki, statistiki i obshchetekhnicheskikh distsiplin.

(Electric railroads—Current supply)

BRYUKHANOV, Vladimir Nikolayevich starshiy prepodavatel'

Setting norms for the consumption of electric power for freight train traction purposes. Izv. vys. ucheb. zav.; elektromekh. 4 no.3:159-167 '61. (MIRA 14:7)

1. Kafedra obshchetekhnicheskikh distsiplin Irkutskogo finansovoekonomicheskogo instituta
(Electric power distribution)
(Electric railroads--Current supply)

BRYUKHANOV, V.N., inzh.

Norm setting for electric power consumption for train traction.
Trudy LIIZHT no.176:115-121 '61. (MIRA 15:5)
(Electric railroads--Current supply)

BRYUKHANOV, V.N.; KOZITSKAYA, M.T.; NEVYAZHSKIY, I.I.

Some problems in the theory of geological interpretation. Trudy VAGT no.8:109-123 '62. (MIRA 15:11)
(Aerial photogrammetry)

BRYUKHANOV, V. N.

""Use of aerophotography for the exploration and appraisal of natural resources" (To be presented orally)

report to be submitted for the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas - Geneva, Switzerland, 4-20 Feb 63.

BRYUKHANOV, V.N.; KOZLOV, V.V.

Methods for speeding-up medium scaled geological mapping. Sov. geol. 7 no.6:128-134 Je '64 (MIRA 18:1)

1. Vsesoyuznyy aerologicheskiy trest.

BRYUKHANOV, V.N.; KOZLOV, V.V.; SULIDI-KONDRAT'YEV, Ye.D.

Earth under a stereoscope; aerial photography helps geologists to determine mineral resources. Priroda 55 no.1:23-32 Ja '66. (MIRA 19:1)

1. Vsesoyuznyy aerogeologicheskiy trest, Moskva.

BRYUKHANOV, V.; REPIN, Yu., doverennyy vrach; PETROV, K., doverennyy vrach

Life dictates. Okhr. truda i sots. strakh. 6 no.11:18-20 N '63. (MIRA 16:11)

1. Predsedatel' Chelyabinskogo sel'skogo oblastnogo soveta professional'nykh soyuzov (for Bryukhanov).

BARJOT, P.; KOLIMEYEV, V.I. [translator]; BRYUKHANOV, Ye.N., kapitan I ranga, redaktor; BELIKOV, A.F., redaktor; SMIRNOVA, N.I., tekhnicheskiy redaktor

[The navy in the atomic age. Translated from the French] Flot v atomnyi vek. Perevod s frantsuzskogo V.I.Kolimeeva. Pod red. E.N. Briukhanova. Moskva, Izd-vo inostrannoy lit-ry, 1956. 271 p. (MIRA 10:1)
(Naval art and science)
(Atomic warfare)

BRYUKHANOV, Yu.A., podpolkovnik

Cooperation of the Air Force with submarines. Mor. sbor. 48 no.4:41-46 Ap '65. (MIRA 18:6)

GNIDENKO, P.D., polkovnik; BRYUKHANOV, Yu.A., podpolkovnik

Use of aviation in marine landing operations. Mor. sbor. 46 no.7: 42-48 Jl '63. (MIRA 16:11)

BLINOV, G.F.; BRYUKHANOV, Yu.N.

Efficiency of seismic prospecting in the Perm Province portion of the Kama Valley. Geol. nefti i gaza 9 no.1:49-52 Ja '65. (MIRA 18:3)

1. Permneft'.

DOBYSHEVA, S.; BRYUKHANOVA, L.

Use of bulls from the Gorki Leninskiye Livestock Farm and their offspring for increasing the butterfat percentage of cows. Agrobiologiia no.4:496-500 Jl-Ag '65.
(MIRA 18:11)

1. Zaveduyushchaya otdelom zhivotnovodstva Chelyabinskoy gosudarstvennoy sel'skokhozyaystvennoy opytnoy stanstii (for Dobysheva). 2. Glavnyy zootekhnik opornogo punkta po povysheniyu zhirnosti moloka Respublikanskoy laboratorii pri Chelyabinskoy gosudarstvennoy opytnoy stantsii (for Bryukhanova).

BRYUKHANOVA, L. S.

BRYUKHANOVA, L. S.= "Investigation of the breakdown of rubber-like polymers in the highly elastic state." Moscow City Pedagogical Inst imeni V. P. Potemkin. Moscow, 1956. (Dissertations for the Degree of Candidate in Physicomathematical Sciences).

SO: Knizhnaya Letopis' No. 22, 1956

BRYUKHANOVA, L.S.; SHCHUKIN, Ye.D.

Effect of mercury coating on the stability of zinc monocrystals at low temperatures [with summary in English]. Inzh.-fiz.zhur. 1 no.8:116-118 Ag '58. (MIRA 11:8)

1. Institut fizicheskoy khimii AN SSSR, Moskva.
(Zinc--Metallography)

BRYUKHANOVA, L. S.

57-2-17/32

AUTHORS: Bartenev, G. M., Bryukhanova, L. S.

TITLE: The Influence Exerted by the Intermolecular Interaction, the Cross-Linking and the Temperature Upon the Destruction and the Time Dependence of the Strength of Caoutchouc-Like Polymers (Vliyaniye mezhmolekulyarnogo vzaimodeystviya, poperechnogo sshivaniya i temperatury na razrusheniye i vremennuyu zavisimost' prochnosti kauchukopodobnykh polimerov)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 2, pp. 287 - 295 (USSR)

ABSTRACT: The following noncrystallizing rubbers were investigated here: polybutadiene-rubbers, butadiene-styrene-rubbers and butadiene--nitrile-rubbers. Cross-linkages were introduced into the rubber by means of sulfur-vulcanization in an electric press at 143°C. The time from the moment of the beginning of strain until the division of the sample into two parts (rupture period or life) was measured. It is shown that the time dependence of the strength in rubber-like polymers is different from that of solid bodies and follows the empirical formula $\tau = B\,\sigma^{-b}$. With the increase

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in the intermolecular interaction (polarity, cross-linking, filling), however, it approaches the dependence characteristic of solid substances. One of the reasons for the behavior of the group of caoutchouc-like polymers is their capability of molecular orientation on deformation. It is further shown that the temperature dependence of the strength of rubber-like polymers follows the exponential law. This temperature-dependence differs from the temperature dependence of the strength of solid polymers by the fact that under various strains no pole occurs at the temperature-curves, whereas in the case of solid polymers such a pole exists. This is explained by the non-exponential dependence of the life of rubber-like polymers on strain. The temperature over time dependence of the strength of rubber-like polymers follows the formula $\tau = C\,\sigma^{-b}\,e^{U/RT}$, where b and C are constants dependent on the type of rubber and the structure of the vulcanization product. U is the activation energy. All rubber-like polymers are in the case of lasting cracks characterized by a destruction taking place in two stages. In the first stage the rough surface of the place of crack develops, in the second stage the smooth one. In the case of an elastic

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crack the fact is specific that, in comparison to the solid bodies, the order of zones at the crack-surface of rubber-like polymers is an inverse one, where the first stage of breack is characterized by a fibrous mechanism of destruction. It is shown that a decrease in strain, of the number of cross-linkages (the equilibrium modulus), of the intermolecular interaction (the polarity) leads to a displacement of the mirror zone by the rough one. A change of temperature influences the relation of the mirror- and the rough zone, in dependence of the kind of rubber, in different ways. There are 10 figures, 2 tables, and 9 references, all of which are Slavic.

ASSOCIATION: Pedagocical Institute, Moscow, imeni Potemkin. Chair of Theoretical Physics. Scientific Research Institute of the Rubber Industry, Moscow. (Moskovskiy pedagogicheskiy institut im. Potemkina. Kafedra teoreticheskoy fiziki. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti. Moskva)

SUBMITTED: January 24, 1957
AVAILABLE: Library of Congress
Card 3/3 1. Rubber-Test results 2. Rubber-Test methods

SOV/20-120-4-19/67

AUTHORS: Likhtman, V. I., Kochanova, L. A., Bryukhanova, L. S.

TITLE: The Brittle Destruction of Single Zinc Crystals (O khrupkom razrushenii monokristallov tsinka)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 4, pp.757-760 (USSR)

ABSTRACT: The single-crystal samples were produced from pure zinc (99,99 %) by the method of zone-crystallization which had been developed in the authors' laboratory. The rules governing the brittle destruction of single zinc crystals with different initial orientations of the basic plane with respect to the axis of the wire ($13^\circ \leqslant \chi_0 \leqslant 80^\circ$) were investigated by means of uniaxial rotation with constant velocity of the extension ($\sim 12\ \%\ min^{-1}$) of the samples in inactive and surface-active media. A diagram shows the results of the experiments carried out with single zinc crystals at the temperature of liquid nitrogen. The plastic displacement preceding the destruction is all the greater the smaller χ_0. Besides, the normal tensions necessary for the break in the

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basal plane decrease considerably with increasing χ_o. The brittle breaking off on the basal plane is facilitated by a previous displacement in this plane. At relatively high normal tensions in the basal plane a slight displacement will already be sufficient to cause elastic breaking off. The experimental data obtained gave the following results: The so-called Zonke Law of the constancy of vertical normal tensions does not apply to single zinc crystals in a brittle state. Plastic displacement causes defects in crystal structure which prove to be the original cause of destruction. No "consolidation when breaking off" was observed in the case of single zinc crystals. The rules governing the brittle destruction in single zinc crystals at low temperatures apply also if transition to the brittle state occurs under the influence of a strong surface-active medium (e.g. mercury). A brittle state of a single zinc crystal that is caused by mercury satisfies the same general regular rules as the viscosity due to low temperatures. There are 4 figures, 1 table, and 15 references, 8 of which are Soviet.

The Brittle Destruction of Single Zinc Crystals SOV/2o-12o-4-19/67

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry AS USSR)

PRESENTED: January 31, 1958, by P.A. Rebinder, Academician

SUBMITTED: January 22, 1958

1. Single crystals--Mechanical properties 2. Single crystals--Test-methods 3. Zinc--Crystallization 4. Zinc--Fracture

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24.7500 18.8200 SOV/181-1-9-21/31

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AUTHORS: Bryukhanova, L. S., Kochanova, L. A., Likhtman, V. I.

TITLE: The Rules Governing the Brittle Destruction of Single Zinc Crystals

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 9, pp 1448 - 1456 (USSR)

ABSTRACT: The present paper offers a contribution to the problems related to modern technical requirements concerning the investigation of the relationship existing between the mechanical properties of metals and the chemicophysical influence exerted by the medium surrounding them during deformation. First, a number of pertinent papers is partly dealt with in detail, among others, publications by Academician P. A. Rebinder et al., Kishkin, Nikolenko, Ratner, Potaka, Shcheglakova, Rozhanskiy, Pertsov, and Shchukin. The authors of the present paper investigated the rules governing the brittle destruction of a single zinc crystal wire at different orientations of the base plane to the wire axis ($13^\circ \leq \chi_0 \leq 80^\circ$) at liquid nitrogen temperature (-196°C) at elongation at a constant rate (~12%/min). The single crystals

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were pure to a degree of 99.99%, and were prepared in the authors' laboratory by zonal crystallization. The critical shearing stress in the base plane attained ~ 130 g/mm^2 at these temperatures and was independent of the orientation of this plane to the crystal axis, as shown by special experiments. Mercury was used as surface-active material. Figure 1 shows the measuring values and the calculated dependence of the limit of the plastic dislocation (a_m) of the single zinc crystals on the orientation angle of the base plane (χ_o). The steep decline of a_m is described by formula $a_m = \frac{(\varepsilon+1)\sin(\chi_o-\chi_1)}{\sin^2\chi_o}$, where ε is the limit of elongation before tearing, χ_1 is the final orientation of the base plane before tearing. Figure 2 shows the dependence of the normal tension N, acting upon the base plane, on the displacement a during deformation at different χ_o values. The following holds; $N = P \sin\chi_o \sin\chi_1$;

P is the indication of the dynamometer, proportional to the degree of elongation. Table 1 contains the values of a_m, N_m, and S_m (shearing stress) for 6 χ_o values in the moment of brittle tearing. Figure 3 shows the dependence of the yield limit P_o and the critical normal tension N_o at the yield limit of χ_o at constant S_o, and figure 4 the dependence of a_m, N_m, and S_m on χ_o. $P_o(\chi_o)$ shows a symmetrical course, first a drop with growing χ_o, a minimum at $\sim 45^o$ and another rise; $S_o(\chi_o)$ rises exponentially with growing χ_o; $a_m(\chi_o)$ drops exponentially, $N_m(\chi_o)$ rises and $S_m(\chi_o)$ shows a linear drop with growing χ_o. Figure 5 shows the drop of N_m with rising pre-deformation (ε_{pre}) at 20^oC. (The samples were first elongated at room temperature, only thereafter cooled, and further elongated to the tearing point). All these experiments were also carried out under other conditions: the transition into the brittle state was not attained by cooling, but by the action of a strongly surface-active agent (Hg). Table 2

shows the measured a_m-, N_m-, and S_m values for this case, and figure 6 the function $P(\varepsilon)$ for nonamalgamated (full circles) and amalgamated (empty circles) single zinc crystals at $\chi_o = 48^\circ$ and $T = 20^\circ C$ (the values coincide within the measuring accuracy). Figure 7 shows $a_m(\chi_o)$ for amalgamated and nonamalgamated samples at $20^\circ C$; in the first case a_m decreases with χ_o, in the latter case it rises strongly. Figure 8 shows $a_m(\chi_o)$, $N_m(\chi_o)$, and $S_m(\chi_o)$ for amalgamated single crystals only, figure 9 $P(\varepsilon)$ for both types at $\chi_o = 48^\circ$ and $T = -196^\circ C$, figure 10 $N_m(\varepsilon_{pre})$ for amalgamated samples at 20° and nonamalgamated at $185^\circ C$. Shchukin (Ref 15) is mentioned in the text. There are 10 figures, 2 tables, and 17 references, 9 of which are Soviet.

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

SUBMITTED: February 20, 1958

S/138/61/000/012/003/008
A051/A126

15.9300

AUTHORS: Bartenev, G.M., Bryukhanova, L.S.

TITLE: Static deformation of rubber-like polymers

PERIODICAL: Kauchuk i rezina, no. 12, 1961, 12 - 15

TEXT: Static deformations are defined as being those which remain constant. A study was conducted on the deformation of rubber-like polymers under conditions of the relation between tensions and deformations, related to a given time of observation. A single-axle expansion was investigated under static loads of various magnitude for non-filled rubbers, based on non-crystallizing rubbers: СКБ (SKB), СКС-10 (SKS-10), СКС-30 (SKS-30), СКН-18 (SKN-18), СКН-26 (SKN-26), СКН -40 (SKN-40); with high-elastic equilibrium moduli 2.6 ± 1 kg/cm^2 and 8.8 ± 1 kg/cm^2, measured according to the НИИРП (NIIRP) method. The following symbols were used: F - weight of the load in kg, S_o - initial area of the transverse section in cm^2, $f = F/S_o$ - conditional tension or specific load (on the initial cross section) (kg/cm^2), δ - true tension calculated according to the formula: $\delta = \lambda f$, where λ - is the multiplicity of the expansion, $\lambda - 1 = \varepsilon$ - expansion deformation (relative elongation). The static moduli E

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were calculated from the slope of the lines obtained (relation between deformations and corresponding true tensions, relative to the same time of observation), by using the Boltsman equation. The following conclusions are drawn: The law of proportionality, previously established for equilibrium deformation of rubber-like lattice polymers is noted also for non-equilibrium static deformations at constant deformations (tension relaxations and at constant loads (fatigue). Thus, in calculating the static deformations within certain limits, the law of proportionality may be applied, if the resilience modulus is taken into account as being dependent on the duration of the loaded state. These conclusions were found to coincide with the mathematical theory of Boltsman. There are 1 figure and 10 references: 8 Soviet-bloc and 2 non-Soviet-bloc. The reference to the most recent English-language publication reads as follows: F.P. Baldwin, J.E. Ivory, R.L. Anthony, J. Appl. Phys., 26, 750 (1955).

ASSOCIATION: Moskovskiy pedagogicheskiy institut im. V.I. Lenina i Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Moscow Teachers Institute im. V.I. Lenina and the Scientific-Research Institute of the Rubber Industry)

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28094
S/181/61/003/009/028/039
B104/B102

AUTHORS: Bryukhanova, L. S., Andreyeva, I. A., and Likhtman, V. I.

TITLE: Rupture strength of metals and the effect of surface-active metal melts on it

PERIODICAL: Fizika tverdogo tela, v. 3, no. 9, 1961, 2774-2778

TEXT: The temperature and time dependences of the strength of amalgamated zinc and gallium-coated cadmium has been investigated. The wire samples were zinc crystals, polycrystalline zinc, and cadmium. Their diameter was 1 mm and their length 10 mm. A contact method was employed to coat the zinc samples with a thin Hg film (5 μ) in a mercury-nitrate solution. The cadmium samples were electrolytically coated with a gallium film. A relation between the lifetime and the angle χ between the basal plane and the sample axis was clearly established for differently oriented zinc single crystals. The values for $\log\tau$ (τ denotes the lifetime in sec) for every χ and different loads are located on straight lines. According to S. N. Zhurkov, the activation energy U of the destruction is given by $U = U_0 - \gamma P$, where γ denotes a structure factor and P the load. Test results furnish

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U_o = 35 kcal/mole. This value agrees with those of other authors. Tests of zinc single crystals with $\chi \approx 50^o$ at 20 and 50°C show that for different loads the time elapsing till the sample ruptures is considerably diminished by the Hg film (from several days to seconds). The same results have been obtained for amalgamated polycrystalline zinc and gallium-coated polycrystalline cadmium samples. It was found that the empirical relation $\tau = \tau_o \exp\left(\frac{U_o - \gamma P}{kT}\right)$ cannot be used to estimate U_o and γ for Zn and Cd samples coated with Hg or Ga films. The effect of the films is not connected with a thermal activation but is the result of adsorption of surface-active atoms. The presence of surface-active substances will not affect the length of the destruction process as long as the normal component of stress is small. However, if this component reaches a value corresponding to the tensile strength of the metal, the surface cracks will grow rapidly and cause the sample to rupture. The rate of growth of these cracks is related to the rate of surface migration of the surface-active substance. It is not connected with any thermal activation of the destruction process. There are 6 figures and 10 references: 9 Soviet and 1 non-Soviet. The reference to English-language publications reads as

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Rupture strength of metals and ...

follows: K. H. Mann et al., J. Phys. Chemistry, 64, 251, 1960.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR Moskva (Institute of Physical Chemistry, AS USSR, Moscow)

SUBMITTED: May 3, 1961

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