MOSHKIN, P.A.; LUTKOVA, V.I.; RAZUMOVA, N.N.; PERTSOV, L.D.; KALINKIN, S.F.

Production of the disodium 3,6-endoxohexahydrophtalate (endothal). Khim.prom. no.4:237-238 Ap '61. (MIRA 14:4)

(Oxabicycloheptanedicarboxylic acid)

PERTSEV, M.A., inzh.

Word of introduction. Trudy NTO chern.met. 20:7-8 '60. (MIRA 13:10)

1. Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii.
(Metallugrical plants)

1. PERTSOV, N. A.

2. USSR (600)

4. Invertebrates - Beloye, Lake

7. Abundant invertebrates of the White Sea tideland as a component food for fish and birds, and a method for determining their average size and weight. Trudy Gidrobiol obve No. 4 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

PERTSOV, N. A.

"Massovye bespozvonochnye litorali Belovo morya kak komponenty pitaniya ryb i ptits i metodika opredeleniya ich srednich razmerov i vesov," Trudy Vsesoyuznogo hidrobiologicheskogo Obshchestva, Vol. 4, 1952

PERTSOV, N.A.

White Sea Biological Station of the Moscow State University. Trudy Belomor.biol.sta.MGU 1:7-21 '62. (MIRA 16:1)

1. Belomorskaya biologicheskaya stantsiya Moskovskogo gosudarstvennogo universiteta.
(White Sea—Marine biology—Research)

1. N. A. PERTSOV

2. USSR (600)

4. Beloye, Lake - Invertebrates

7. Abundant invertebrates of the White Sea tideland as a component food for fish and birds, and a method for determining their average size and weight. Trudy Gidrobiol. no. 4. 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

PERTSOV, N. V.

120-3-27/37

AUTHOR: Shchukin, Ye. D., Pertsov, N. V., and Rozhanskiy, V. N.

TITLE: A Method for the Investigation of Irregularity of Plastic Deformation. (Metodika Issledovaniya Neravnomernosti Plasticheskoy Deformatsii.)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No. 3, pp. 98 - 102 (USSR).

ABSTRACT: Jump-like deformation of metallic mono-crystals at constant loads is fully discussed in References 1 - 3. The results of previous investigations have shown that in order to obtain more accurate data for the investigation of the effects of evalanche shear, the sensitivity of the channel 1 and the frequency pass bands of the channel R should be increased. In the present article the authors describe a method of continuous registration of small sample deformations with an accuracy of down to 50Å and frequency pass band of the channel 0 - 2000c/s, and of simultaneous small changes of the sample resistance with accuracy down to 0.5×10^{-8} ohm and frequency band from a fraction of a cycle to 1000c/s. A schematic diagram of the mechanical part of the apparatus is given in Figure 1. It is assembled on a vibration proof and temperature insulated plate, the sample used is a wire

Card 1/2 0.5mm diameter, 3.30mm long. The channel of the register

A Method for the Investigation of Irregularity of Plastic Deformation. 120-[illegible]-27/37

(Fig. 2) uses a photo cell type StsV-3 (СЦВ-3) placed with its light source in the chamber 1. The channel for the registration of jump-like changes of the electrical resistance (channel R, Fig. 3) consists of a sensitive AC amplifier with a frequency band from 4–2000c/s and with the level of fluctuation noise as referred to the input, of the order of a few thousandths of μV. The experiments have shown that the instrument has a high degree of sensitivity and stability. A schematic diagram of the mechanical installation, the basic circuit diagram of channel 1, the basic circuit diagram of the channel R and a photograph of small jump-like deformations are given. There are 4 Slavic references.

SUBMITTED: November, 28, 1956.

ASSOCIATION: Institute of Physical Chemistry of the Academy of Sciences of the USSR. (Institut Fizicheskoy Khimii AN SSSR) Faculty of Chemistry of the Moscow State University imeni M. V. Lomonosov. (Khimicheskiy Fakul'tet MGU im. M. V. Lomonosova.)

AVAILABLE: Library of Congress.

Card 2/2

PERTSOV N.V.

ROZHANSKIY, V.N.; PERTSOV, N.V.; SHCHUKIN, Ye.D.; REBINDER, P.A., akademik

Effect of thin mercury coatings on the strength of metallic single crystals. Dokl. AN SSSR 116 no.5:769-771 O '57. (MIRA 11:2)

1.Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova.
(Metal crystals)

PERTSOV, N. V., SHCHUKIN, Ye. D., ROZHANSKIY, V. N., and GORUNOV, G. V.

"Unhomogeneous Plastical Deformation and eht Effect of Surface-Active Mediums on the Mechanical Properties of Crystals."

paper presented at the Conf. on Mechanical Properties of Non-Metallic Solids, Leningrad, USSR, 19-26 May 58.

Moscow State Univ., Inst. of Physical Chem. Acad. Sci. USSR, Moscow.

PERTSOV, N. V., V.N. ROZHANSKIY, Ye. D. SHCHUKIN, and Yu. V. GORYUNOV

"The Emersion of Dislocations on the Crystal Surface as well as the Development of Fissures."

report presented at the Conference on Investigation of Mechanical Properties of Non-Metals, by the Intl. Society of Pure and Applied Physics and the AS USSR, at Leningrad, 19-24 May 1958.
(Vest. Ak Nauk SSSR, 1958, no. 9, pp. 109-111)

PERTSOV, N V

by Z. G. Pinsker ("Basis of diffractional methods of investigation of perfect crystals"), B. M. Rovinskiy and L. M. Rybakova ("Investigation of dependence of mechanical properties on characteristics of structure of metals"-), L. M. Utevskiy and P. M. Usikov ("Application of microscopy in investigation of structure of alloys"), A. A. Predvoditelev and N. A. Tyapunina ("Role of reproduction of dislocations in process of plastic flow"), A. V. Pertsov, N. V. Pertsov and E. D. Shukin "Self-producing internal dispersion of metals under action of strongly superficially-active metallic melting") and I. L. Mirkin ("Problems of structural investigations, advanced by requirements of progress of technology").

reports presented at the 3rd Intervuz Conference on Strength and Ductility of Metals, Petrozavodsk State University, 24-29 June 1963.
(reported in Fizika Metallov i Metallovedeniye, Vol. 16, No. 4, 1963, p 640.
JPRS 24,651 19 May 1964.

Pertsov, N. V.

20-2-19/60

AUTHORS: Shchukin, Ye. D., Goryunov, Yu. V., Pertsov, N. V., Rozhanskiy, V. N.

TITLE: On the Nature of the Unhomogeneous Plastic Deformation of Metal Mono-Crystals (O prirode neravnomernosti plasticheskoy deformatsii metallicheskikh monokristallov)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 277 - 279 (USSR)

ABSTRACT: In a previous work the following was shown: The jumps of deformation of 0,5 to 20 μ which usually can be observed in the case of expansion of a zinc-crystal, have a very complicated structure and are the sum of a series of elementary jumps, which form in the various cross sections of the crystal. The investigation of the elementary shifts made it necessary to diminish the inertia of the apparatus considerably and to increase its sensitivity to 50 Å. The mono-crystals with the diameter of 0,4 to 0,8 mm, which were of very pure (99,99 %) zinc, cadmium, tin, lead and aluminum, were stretched during constant stress and at room temperature, whereby the stress was a bit higher than the stretching-strain limit.

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On the Nature of the Unhomogeneous Plastic Deformation of Metal Mono-Crystals

In all the cases of the test-pieces (save aluminum) together with the deformation also the change of the electric resistance of the test-piece was registered. In the case of stretching zinc, cadmium and tin many small jumps of 150 to 200 Å on to 2 000 Å with a duration of 1 - 3 to 30 microseconds were registered. Jumps until 10 000 - 15 000 Å were found rather seldom, and if they were found, they were usually of several small jumps. Also considerably less expressed jumps of 1 000 to 5 000 Å were observed. By careful microscopic examination of the deformed crystals was found out that those jumps of deformation result on shearing and not on twin-formation. The number of jumps, which can be observed, increases with the decrease of their size (at least on to 250 - 300 Å). Obviously there is no minimum size of the jumps, but a superior limit of the elementary shift. In the case of mono-crystals of aluminum and of lead a clearly marked formation of jumps was not observed. The results which were found out here prove the results on large jumps. The discontinuity of the flow and the quick jumps are to be regarded as a common feature which is produced by the nature of dislocation of the plastic deformation. There are 4 figures, and 6 references, 3 of which are

5(4)

AUTHORS: Pertsov, N. V., Rebinder, P. A., Academician SOV/20-123-6-30/50

TITLE: On the Surface Activity of Liquid Metallic Coatings and Their Influence on the Strength of Metals (O poverkhnostnoy aktivnosti zhidkikh metallicheskikh pokrytiy i ikh vliyanii na prochnost' metallov)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 1063 - 1070 (USSR)

ABSTRACT: One and the same coating of easily fusible metals diminishes the strength of some metals but exercises no influence on other metals. On the other hand, also the behavior of one and the same metal depends on the chemical nature of the metallic coating. The decrease in strength can by no means be ascribed to the dissolving effect of the molten coating, nor need it be connected with the selective effect on the grain boundaries Experimental data on the influence exercised by easily fusible metal coatings upon the mechanical properties of metals are divided into two distinctly separated groups: 1) The strength of the investigated metal is considerably reduced. 2) There

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is no such reduction of strength. A comparison of these data with the diagrams for the fusibility of the corresponding binary systems metal-coating shows that to the decrease of the strength of a solid metal under the influence of a liquid coating there always corresponds the existence of a sufficiently narrow but absolutely finite domain of the formation of a solid solution. Corresponding to the complete lack of strength reduction, there corresponds, in this diagram, a wide range to which there corresponds the formation of a solid solution of the metal coating in the investigated metal. Seen from this point of view, the results obtained appear to be trivial. If however, the range characterizing the production of the solid solution is so narrow that also the system metal coating is outside this range, the deformation of the metal takes place in the presence of the liquid phase of the coating. The reduction of the strength of the solid body (of the metal) may be explained by the absorptive effect of the molten metal coating. In polymolecular transition layers to the film of

On the Surface Activity of Liquid Metallic Coatings and Their Influence on the Strength of Metals SOV/20-123-6-30/50

the liquid phase on the surface the work of formation on the discontinuity surfaces decreases with an increase of reciprocal fusibility. There are 1 figure, 1 table, and 8 references, 7 of which are Soviet.

ASSOCIATION: Kafedra khimii Moskovskogo stankostroitel'nogo instituta (Chair of Chemistry of the Moscow Machine Tool Institute)
Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Colloid Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: September 16, 1958

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SOV/70-4-6-14/31

AUTHORS: Shchukin, Ye. D., Pertsov, N. V., Goryunov, Yu. V.

TITLE: Concerning the Change in Mechanical Properties, Structure, and Electrical Conductivity of Metallic Single Crystals Under the Influence of a Strongly Active Adsorptive Medium

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 6, pp 887-897 (USSR)

ABSTRACT: This article deals with changes in the mechanical strength and deformation characteristics of solids due to vanishingly small amounts of adsorbed surface-active matter, increased plasticity and flow rates, lowered yield limits of metals covered by organic compounds which are lightly surface-active, and increased brittleness of high-melting metals coated by low-melting metal melt such as of Zn and Cd coated by Hg or Sn. Possible explanations for these phenomena are cited from the works of Academician P. A. Rebinder and his school (Dokl. Acad. Sci. USSR, 111, 1284, 1956; and others). The authors studied the

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Concerning the Change in Mechanical Properties, Structure, and Electrical Conductivity of Metallic Single Crystals Under the Influence of a Strongly Active Adsorptive Medium

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physical properties and structures of polycrystalline specimens and artificially grown single crystals of Zn, Cd, Sn, Pb, and Cu of highly pure compositions, 0.5-1 mm in diameter and 10-25 mm long, with or without coating by molten Ga or Hg. The experimental data are presented in figures and tables below (Fig. 2c, 4, 5, 11). X-ray diffraction data disclosed that Ga-coating with subsequent Ga penetration into the crystals increases unit cell dimensions and leads to a gradual partition of Sn and Zn single crystals into an increasingly larger number of disoriented blocks, i.e., to the transformation of single crystals into polycrystalline specimens. Ga-coated Cd, and Hg-coated Zn crystals did not show partition into blocks even after long aging. Ga-coating improved the mechanical properties of polycrystalline Sn and Zn. The electric resistivities along the axes of high resistance of Sn and Zn single crystals dropped rapidly with the partition into blocks and increased along the

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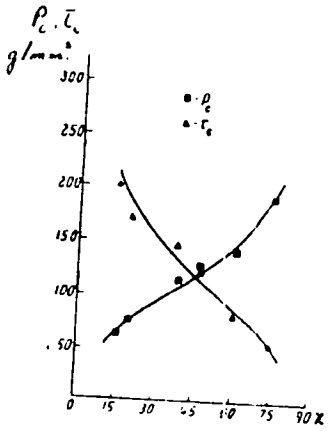

Fig. 2c. Ultimate tensile (p_c) and shear (τ_c) stresses as functions of the orientation of Zn single crystals coated by Ga-melt, at indoor temperature. X denotes angle between basal plane and crystal axis at rupture point.

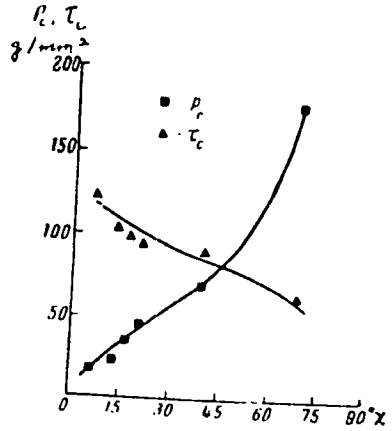

Fig. 4. Ultimate tensile (p_c) and shear (τ_c) stresses as functions of the orientation of Cd single crystals coated by Ga-melt, at indoor temperature. X denotes angle between basal plane and crystal axis at rupture point.

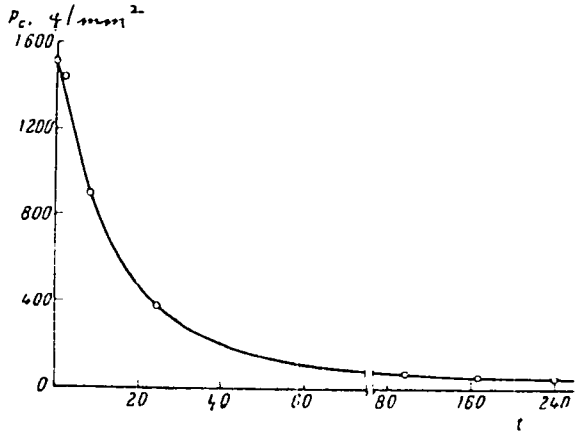

Fig. 5. Ultimate tensile stress P_c in a Sn single crystal as function of aging, after coating by Ga-melt at indoor temperature. Stretching at the rate of 2.4 mm/min of a crystal 13-14 mm long and 0.62 mm thick: $\lambda_{[001]} \approx 45^\circ$; o denotes average of 3-4 measurements.

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Concerning the Change in Mechanical Properties, Structure, and Electrical Conductivity of Metallic Single Crystals Under the Influence of a Strongly Active Adsorptive Medium

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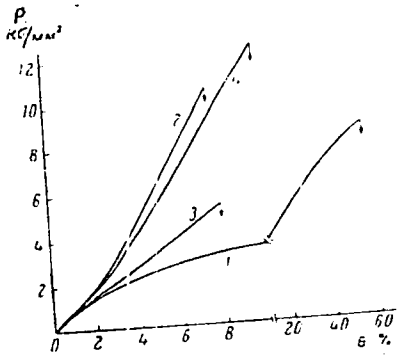

Fig. 11. Tension curves of single-crystal and polycrystalline Sn at temperature of liquid N. P is ultimate tensile stress; ε, elongation (%); (1) and (3), single-crystal and polycrystalline Sn, respectively, without Ga-coating; (2) and (4) the same with Ga-coating.

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Concerning the Change in Mechanical Properties, Structure, and Electrical Conductivity of Metallic Single Crystals Under the Influence of a Strongly Active Adsorptive Medium

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low-resistance axes; both approached the resistivity of the respective polycrystalline specimens. Pb and Cd only slightly changed their resistivities. Improved mechanical properties of polycrystalline specimens seem to open a new way for development of high-strength alloys. A. I. Kitaygorodskiy and V. I. Likhtman are acknowledged for discussions. There are 11 figures; 2 tables; and 29 references, 24 Soviet, 3 U.K., 1 German, 1 Japanese. The U.K. references are: A. Deruyttère, G. B. Greenough, J. Inst. Metals, 84, 337, 1956; A. N. Stroh, Proc. Roy. Soc. A, 223, 404, 1954; A. N. Stroh, Philos. Mag., 3, 597, 1958.

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

SUBMITTED: September 2, 1959

Card 6/6

24(2, 6) SOV/170-59-6-1/20

AUTHORS: Pertsov, N.V., Goryunov, Yu.V.

TITLE: On the Effect of Thin Mercury Coating on the Strength and Deformation Properties of Metallic Single Crystals

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 6, pp 3 - 8 (USSR)

ABSTRACT: The effect of adsorption reduction of metal strength was discovered by P.A. Rebinder [Refs 1-3] and was studied by S.T. Kishkin, Ya.M. Potak [Refs 4-6] and V.I. Likhtman and L.A. Kochanova [Ref 7]. The authors of the present article investigated the effect of a thin, about one micron, mercury film on the strength and deformation properties of zinc, tin, cadmium and lead single crystals. O.A. Baryshnikov, a post-graduate of the Colloidal Chemistry Chair of the MGU, took part in this investigation. Its aim was to study regularities and mechanism of the action of low-melting metallic coatings and to clear up the causes for the specific features of their action. The purity of metal crystals investigated was 99.99%. Two methods of investigation were applied: stretching with a constant speed and stretching under the action of constant load. The results of experiments are presented in the form of the curves which show relationships between the stress P and specific elongation ε for

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On the Effect of Thin Mercury Coating on the Strength and Deformation Properties of Metallic Single Crystals

zinc (Figure 1) and for tin (Figure 3) and between the specific elongation and the duration of load application (Figures 2 and 4). The analysis of the results obtained led the investigators to the following conclusion: a thin mercury coating applied in the form of a thin film on single crystals of metals, may alter their physical properties in three different ways: to strengthen metals (zinc, cadmium, tin, lead), to reduce the strength of metals (zinc, tin), or to increase their ductility (zinc). The first effect is a result of the diffusion of mercury atoms into the lattice of deformed single crystals, and it comes into being when the metal of a coating is well soluble in the main metal. The sharp reduction of the main metal strength is a result of the low solubility of the metal coating in the main metal, indicating its surface activity, i.e., capacity to reduce the metal surface energy by means of forming a mono- or polyatomic layer on the surfaces appearing during deformations. The microscopic studies of the specimens after stretching have shown that amalgamated single crystals were stretched out considerably more uniformly than non-amalgamated ones.

PERSOV, N. V.

"The Surface Activity of Liquid Metallic Coverings and Their Effect on the Strength of the Metals."

report presented at the Section on Colloid Chemistry, VIII Mendeleyev Conference on General and Applied Chemistry, Moscow, 16-23 March 1959.
(Koll. Zhur. v. 21, No. 4, pp. 509-511)

PERTSOV, N.V.; GORYUNOV, Yu.V.; KOCHANOVA, L.A.; LIKHTMAN, V.I.

Effect of the deformation rate and temperature on the value of adsorption capacity of reducing strength and plasticity of metals in fusible metal melts. Inzh.-fiz.zhur. no.12:77-82 D '59. (MIRA 13:4)

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

AUTHORS: Geryunov, Yu. V., Pertsov, N. V., Rebinder, P. A., Academician SOV/20-127-4-15/69

TITLE: Reduction of Strength by Adsorption and Brittle Failure of Zinc and Cadmium Single Crystals

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 4, pp 784-787 (USSR)

ABSTRACT: The authors had already ascertained (Refs 1-3) that also highly plastic bodies can be destroyed under the influence of highly adsorbent metals; the metals form fine liquid inclusions in the plastic body. In the present paper, this process is investigated by means of Zn- and Cd-single crystals; gallium was used for the formation of inclusions. The gallium was precipitated on the crystals as a thin film so that a solution of the gallium in the crystals was impossible under the existing concentration conditions. The destruction of the single crystals was investigated at various initial orientations of the glide planes. The crystals were stretched at a constant elongation rate. The crystals treated with gallium were subjected to this process and showed a reduction in density, and were destroyed in all

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orientations investigated, thus forming basal glide planes. Figures 1 and 2 show the results of the investigations. The Zonke's law of the constancy of the normal stress at a fracture was not observed. Likhtman, Kochanova, and Bryukhanova had already pointed out this fact (Ref 5). The law of Likhtman and Shchukin (Ref 6) was observed, which assumes the constancy of the derivation of the normal and shearing stress. The effect of the gallium is based on its high surface activity. A mechanism of the formation of inclusions is indicated. There are 3 figures and 7 Soviet references.

ASSOCIATION: Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Colloid Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: May 23, 1959

SOV/20-128-2-13/59

24(2), 18(6)
AUTHORS: Goryunov, Yu. V., Pertsov, N. V., Shchukin, Ye. D., Rebinder, P. A., Academician

TITLE: Variation in the Structural and Mechanical Properties of the Single Crystals of Tin Under the Influence of a Strongly Adsorptionactive Medium

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 2, pp 269 - 272 (USSR)

ABSTRACT: This article deals with the influence exercised by a thin liquid gallium film upon the mechanical and structural properties of the single crystals of tin and upon their electrical conductivity. Differently oriented single crystals of tin (degree of purity 99.999 %, diameter 0.5 - 1 mm, length 10-25 mm) were bred by the method of zone crystallization. The liquid metallic gallium was mechanically applied to the surface of the samples in a quantity of from tenths of a milligram to 5-10 mg. As in the case of Zn-Hg and other pairs mentioned already earlier, plasticity and strength of the single crystals of tin decrease abruptly as soon as the gallium has been applied to the sample surface. However, they decrease even

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more in the course of time. After a few days, the sample is pulverized by the pressure of a finger-nail. A diagram illustrates the results obtained by measurement of the true tensions of the break resulting from an elongation of the gallium-coated single crystals of tin at a constant velocity of ~20% min^{-1} as a function of the period of time passed since the coating of the samples with gallium. The extreme relative prolongations increased by 30% (as a maximum value) immediately after the samples had been coated with gallium. This percentage dropped to some per cent after the samples had been exposed to room temperature for 24 hours, and after some days it was only very small. The strength of single crystals coated with gallium amounts to 1.5 kg/mm^2 approximately immediately after the coating, and drops to 50 g/mm^2 after 7-10 days. X-ray pictures taken before and after the coating showed that after the coating the single crystal gradually decomposes into distinctly disoriented blocks. After some days the initial stains on the X-ray picture vanish almost completely, and the picture resembles that of a polycrystalline metal. At a sufficient quantity of gallium and sufficiently long action of the

latter on the single crystal of tin, this phenomenon extends throughout the entire crystal volume. In the case of samples oriented in such a manner that their original resistance is only small (i.e. at large angles $\lambda_{[001]}$ between the tetragonal axis and the sample axis), resistance increases in the course of time, while it gradually drops after the coating of samples with high original resistance (if the tetragonal axis is near the sample axis). Gallium (or gallium saturated with tin) is a strong adsorbent for tin. During elongation in liquid nitrogen the strength of samples coated with gallium really increases as compared to single crystals without coating. The authors thank Professor V. I. Likhtman, who contributed to a discussion of the results of this article. There are 4 figures, 2 tables, and 27 references, 26 of which are Soviet.

Variation in the Structural and Mechanical Properties of the Single Crystals of Tin Under the Influence of a Strongly Adsorption-active Medium SOV/20-128-2-13/59

ASSOCIATION: Otdel dispersnykh sistem Instituta fizicheskoy khimii Akademii nauk SSSR (Institute for Disperse Systems of the Institute of Physical Chemistry of the Academy of Sciences, USSR)Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Colloid Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 5, 1959

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SOV/20-128-5-40/67

AUTHORS: Pertsov, N. V., Goryunov, Yu. V., Kochanova, L. A., Likhtman, V. I.

TITLE: On the Mechanism Underlying the Effect of Readily Fusible Metal Melts on the Mechanical Properties of Less Readily Fusible Metals

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5, pp 1003-1005 (USSR)

ABSTRACT: The authors give a survey of the processes occurring in metallic monocrystals by applying deformative forces. The necessary shear stress rises with increasing deformation of the lattice. Dislocations are confronted with obstacles in the glide plane which are the more difficult to surmount the more strongly are the processes of regeneration (which depend on the thermal motion of atoms) inhibited by low temperatures or great deformation rates. In this connection, hollow cores of dislocation are produced as origins of microgaps. Contrary to organic surface-active substances such as alcohols and organic acids, surface-active metal melts enter the deformed monocrystal, are adsorbed at the gap walls, and promote its development by reducing the energy consumption required for the formation of a new surface. This effect was investigated with pure tin monocrystals (99.999% Sn) and mercury as a surface-active, liquid metal. The effect was

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On the Mechanism Underlying the Effect of Readily Fusible Metal Melts on the Mechanical Properties of Less Readily Fusible Metals

absent at room temperature. This is explained by the fact that room temperature is too close to the melting point of tin so that the processes of regeneration are vigorous. The crystal strength is reduced not before great deformation rates have been attained (Fig 2). Figure 2 shows that the adsorption effect of mercury increases quite expectedly at low temperatures, but again diminishes near the freezing point of Hg. If a readily fusible metal is, however, surface-active with respect to a less readily fusible metal, an optimum range of temperature and deformation rate will be found in which the adsorption effect becomes effective. The increasing effect of readily fusible metal melts with rising hardness of carbon steels which was found by S. T. Kishkin et al. (Ref 10) may be explained in a similar manner. There are 2 figures and 12 references, 11 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov). Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

PRESENTED: May 28, 1959 by P. A. Rebinder, Academician
SUBMITTED: May 18, 1959

PERTSOV, A.V.; MIRKIN, L.I.; PERTSOV, N.V.; SHCHUKIN, Ye.D.

Spontaneous dispersion under conditions of a strongly retarded free inter-phase energy. Dokl. AN SSSR 158 no.5:1166-1168 O '64. (MIRA 17:10)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom P.A.Rebinderom.

ACC NR: AP7003695

SOURCE CODE: UR/0020/67/172/005/1137/1140

AUTHOR: Portsov, A. V.; Goryunov, Yu. V.; Portsov, N. V.; Shchukin, Yo. D.; Rebinder, P. A.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Fine pulverization of metals in the presence of strongly adsorption-active metallic melts

SOURCE: AN SSSR. Doklady, v. 172, no. 5, 1967, 1137-1140

TOPIC TAGS: gallium, zinc, powder metal production, molten metal

ABSTRACT: On the basis of the assumption that the mechanical dispersion of solid metals should be accelerated in the presence of adsorption-active metallic melts, the pulverization of solid zinc in the presence of liquid gallium was studied. It was noted that quenched zinc alloys containing 1-6% Ga are converted after 5 min of pulverization into a powder with a particle size from one to several tens of microns. At higher Ga concentrations the pulverization ceased because a paste was formed. To prevent this, the particles formed by the pulverization were stabilized with butyl acetate. Gallium was found to speed up the pulverization and decrease the size of the particles formed. The effectiveness of its action (i. e., the decrease of the work of dispersion) was evaluated by determining the specific surface of the powder

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UDC: 541.18.053 : 546.3 + 532.6

ACC NR: AP7008695

formed as a function of time on the basis of sedimentation analysis. It was found that the introduction of even 1% Ga into zinc causes a 200-fold decrease of the work of dispersion. For the alloy with 10% Ga, the maximum surface is 0.3 m^2/g, which corresponds to a mean particle size of about 1.5 μ. Gallium also accelerates the pulverization of tin, cadmium, aluminum and bismuth. It is expected that the proposed method of preparing metal powders (fusion with small amounts of an adsorption-active metal followed by pulverization in a stabilizing medium) will find broad applications, especially in powder metallurgy. Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: 14Apr66/ ORIG REF: 006/ OTH REF: 004

Card 2/2

GORYUNOV, Yu.V.; PERTSOV, N.V.; SUMM, B.D.; SHCHUKIN, Ye.D.

Effect of the microrelief on the regularities of distribution of a liquid metal on a solid metal surface. Dokl. AN SSSR 146 no.3: 638-641 S '62. (MIRA 15:10)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom P.A.Rebinderom.
(Liquid metals) (Diffusion) (Surfaces (Technology))

PERTSOV, A. V. ; PERTSOV, N. V. and SHCHUKIN, Ye. D.

"About the Spontaneous Inner Dispersion of Metals Subjected to the Action of Metal Fusions Considerable Lowering Surface Tension."

report presented at the 3rd Conference of Higher Educational Institutes on Strength and Plasticity of Metals, Petrozavodsk State University , 24-29 June 1963

L 24488-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AP6006987 (A) SOURCE CODE: UR/0190/66/008/002/0352/0356

AUTHORS: Andrianov, K. A.; Yakushkina, S. Ye.; Karaseva, T. M.; Pertsova, N. V. 34 B

ORG: Institute of Elementoorganic Compounds, AN SSSR (Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Polymerization of methylphenylcyclosiloxanes

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 2, 1966, 352-356

TOPIC TAGS: polymerization, linear polymer, polysiloxane, polymerization rate, solid viscosity

ABSTRACT: Polymerization of eight-membered cyclosiloxanes with varying numbers of methyl and phenyl groups was investigated, and the relationship between viscosity, molecular weight, and the structure of the polymers was studied. Reaction performed at 150C in the presence of 0.5% KOH yielded linear polymers of high molecular weight. It was established that the number of phenyl groups in the ring affects the polymerization rate, as can be seen in Fig. 1. Apparently, in the process of polymerization of methylphenylcyclotetrasiloxanes and the fission of the Si-O bond, phenyl radicals are split off. The rate of this process decreases with an

UDC: 66.095.26+678.84

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L 24488-66
ACC NR: AP6006987

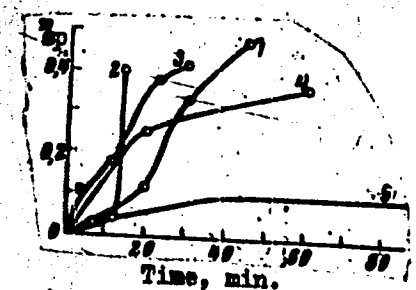

Fig. 1. Specific viscosity as a function of polymerization time: 1 - octamethylcyclotetrasiloxane, 2 - heptamethylphenylcyclotetrasiloxane, 3 - hexamethyldiphenylcyclotetrasiloxane, 4 - pentamethyltriphenylcyclotetrasiloxane, 5 - tetramethyltetraphenylcyclotetrasiloxane.

increased number of phenyl groups. For polymers having 48% of phenyl groups, the relationship between molecular weight and specific viscosity $[\eta] = 1.24 \times 10^{-4} M^{0.62}$. Orig. art. has: 2 tables, 4 figures, and 3 formulas.

SUB CODE: 07/ SUBM DATE: 24Mar65/ ORIG REF: 004/ OTH REF: 002

Card 2/2 PB

SUMM, B.D.; BORYUNOV, Yu.V.; PERTSOV, N.V.; TRASKIN, V.Yu.; SHCHUKIN, Ye.D.

Propagation of cracks in zinc plates during their deformation in presence of a locally applied drop of liquid, surface-active metal. Fiz.met.i metalloved. 14 no.5:757-765 N '62. (MIRA 15:12)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Zinc--Testing)

S/126/62/014/005/006/015
E193/E383

AUTHORS: Summ, B.D., Goryunov, Yu.V., Fertsov, N.V., Preskin, Z.Yu. and Shchukin, Ye.D.

TITLE: Propagation of cracks in zinc plates deformed in the presence of an isolated molten drop of a surface-active metal

PERIODICAL: Fizika metallov i metallovedeniye, v. 14, no. 5, 1962, 777 - 785

TEXT: In continuation of earlier work (B.D. Summ et al - DAN SSSR, 1961, 136, 1392) the present authors studied the effect of locally applied drops of molten mercury and gallium on the resistance of zinc to fracture. The experiments with mercury were conducted at room temperature on technical grade, 98.7% pure, zinc specimens, 0.8 - 5.0 mm thick and up to 50 cm wide. Specimens of this type, gripped at one end in the horizontal position, could be bent through 90° without formation of visible cracks in the absence of a surface-active substance. If, however, a drop (0.2 - 10 mg) of mercury was placed on the upper surface of the test piece in its central line, 15 - 30mm from the fixed end, a crack was formed

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beneath the mercury drop when the bending moment reached a value producing a constant tensile stres of 7 - 9 kg/mm^2 (in the absence of mercury this stress was barely sufficient to cause a slight plastic strain). The crack absorbed all the liquid mercury in a fraction of a second and continued to increase at a progressively diminishing rate in the direction normal to the tensile stress its length (in the case of a 40 mg mercury drop) after 1, 5 and 240 sec being, respectively, 15, 72 and 120 mm. Depending on the mass m of the mercury drop, the time t required for the crack to reach its final length L varied from 15 min (for larger drops) to several days (for small drops). With increasing m and decreasing thickness d of the specimen, L increased; the variation in L could be described by $L \sim m^{2/3}$ at a constant d. According to the present authors the magnitude of L was determined by two competing processes: a) spreading of the mercury drop on the walls of the crack from the point of application towards the ends of the crack and b) penetration of the mercury into the metal through the walls of the crack. Equations were derived describing the kinetics of these processes. Analysis of these equations showed that the latter process was not due to

accelerated volume diffusion alone but was a result of several processes which included the following: formation and growth of a network of ultramicroscopic cracks on the walls of the main crack; spreading of mercury in these cracks by the mechanism of both capillary flow and two-dimensional migration; formation of two-dimensional defects on the walls of the main crack and spreading of mercury on these defects by the mechanism of two-dimensional migration; volume diffusion. If a bending moment considerably longer than the minimum required to trigger-off the process of crack-formation was applied to the zinc plate, microscopic cracks branching-off the main crack were formed; as a result, the final length of the main crack decreased with increasing applied stress. This effect was particularly noticeable in experiments conducted at a constant load as opposed to those conducted at a constant tensile stress. The experiments with gallium were conducted at 35 - 36 °C. In this case, there was a time lag between the application of stress and formation of a crack in the zinc specimen, the time lag decreasing with increasing stress. The rate at which gallium filled the crack was relatively slow and the rate of growth sharply decreased from the moment at which the entire volume of the

gallium drop was drawn from the specimen surface into the crack. Cracks formed under the action of liquid gallium had a stronger tendency to branch off and the relationship between L and m was described by $L \sim m^{2.5}$. These differences were attributed to the fact that the surface energy of zinc was decreased more by gallium than by mercury and that liquid gallium - in contrast to mercury - did not spread on a flat zinc surface except by the mechanism of surface diffusion. Exploratory experiments of a similar nature were also conducted on cadmium. No crack-formation was observed, in this case, in the presence of liquid mercury. Cracking of cadmium in contact with liquic gallium occurred only at high loading rates; even then, a crack was formed only if the cadmium specimen had been in contact with liquid gallium for at least 20 - 30 min before the stress was applied. There are 5 figures.

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

SUBMITTED: March , 1962

Card 4/4

S/025/62/000/008/001/002
D290/D307

AUTHORS: Pertsov, N.V., Candidate of Chemical Sciences, and Rebinder, P.A., Academician

TITLE: Destruction - the road towards strengthening of materials

PERIODICAL: Nauka i zhizn', no. 8, 1962, 24 - 32

TEXT: The authors discuss the effect of surface adsorption of various substances on the strength of materials, and describe the way in which the strength of a solid can be reduced by the adsorption of lubricants or of fusible alloying of metals which are intended to facilitate working of the alloy. Results have shown that an alloy is weakened only if the fusible metal is sparingly soluble in the refractory metal; therefore the solubilities of fusible metals in refractory metals are being systematically studied. The possibility of producing strong new alloys by using surface-active fusible metals as a means of binding together powdered refractory metals is also being

Card 1/2

studied. The authors hope that the study of the mechanisms of reduction in strength and of fracture will enable new materials with controlled, desirable mechanical properties to be produced. There are 8 figures.

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41338

S/020/62/146/003/016/019
B101/B144

AUTHORS: Coryunov, Yu. V., Pertsov, N. V., Summ, B. D., Shchukin, Ye. D.

TITLE: Effect of the microrelief on the rules governing the propagation of liquid metal on a solid metal surface

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 3, 1962, 638-641

TEXT: When the propagation of mercury on a backing of crystalline zinc freed from the oxide film by NH_3 was being studied, two types of propagation dependent on the microrelief were observed for the first time: wetting and diffusion. These processes differ essentially in their mechanisms. On a smooth zinc surface the mercury forms as a drop with the edge of contact $\vartheta = 7^0$. A dull spot propagates from the periphery of the drop, showing the time dependence $r \sim t^{0.5}$ which is characteristic of diffusion processes. The mass m of the drop does not affect the propagation velocity. For smooth zinc lamellas dipped obliquely into mercury, this velocity does not depend on the angle of inclination. The rate of

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diffusion increases with rising temperature owing to the temperature dependence of the diffusion coefficient: $D_{surf} \sim \exp(-U/kT)$, where U = activation energy. On zinc surfaces roughened by etching with HNO_3 the mercury drop forms no constant edge of contact, and the spot propagates by the movement of the liquid Hg layer. The rise of Hg on rough surfaces depends on the angle of inclination of the surface and on the mass of the drop. $r = (6m\Delta\sigma/\pi\eta_L\delta)^{1/4}t^{1/4} = At^{1/4}$ holds, which is in good agreement with the experimentally determined dependence $r \sim t^{0.3}$. $\Delta\sigma = \sigma_{32} - \sigma_{12} - \sigma_{31}$, where σ_{12}, σ_{32}, σ_{31} are the specific free surface energies of the liquid at its interface with the medium, the solid at its interface with the medium and the solid at its interface with the liquid, respectively; η_L = viscosity of Hg, δ = density of Hg. If the smooth surface has a groove in the form of an isosceles triangle with the interior angle α, the Hg will flow along the groove if $\psi < (180 - \alpha)/2$. Examination of the profilograms of differently roughened surfaces confirmed that wetting occurred instead of diffusion if $\alpha \sim 160^\circ$. Conclusions: On an ideally smooth surface, and under the action of surface tension alone, a thin liquid layer will not spread as the migration of liquid atoms

reduces the surface energy of the solid ahead of the propagation front. If a surface has no microrelief, no wetting will occur. Similar studies might be of value for analyzing the propagation of liquids on liquid surfaces. There are 4 figures.

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

PRESENTED: May 23, 1962, by P. A. Rebinder, Academician

SUBMITTED: May 15, 1962

18.9500 1521

32803
S/137/61/000/012/124/149
A006/A101

AUTHORS: Rebinder, P.A., Liknitman, V.I., Shchukin, Ye.D., Kochanova, L.A., Perteev, N.V., Goryunov, Yu.V.

TITLE: Regularities and the mechanism of the effect of small surface active admixtures on deformation and strength properties of single crystal metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 12, 1961, 34-35, abstract 12Zh254 ("Tr. In-ta fiz. metallov, AN SSSR", 1960, no. 23, 147-161)

TEXT: Experiments were made with differently oriented Zn and Cd single crystals of 1 mm in diameter, coated with a thin film of surface active Sn and Hg metals. It is shown that at temperatures over T_e of "base metal-coating" eutectics, the presence of a molten surface-active metal layer strongly reduces deformability and strength of the specimen and promotes brittle failure. The brittle effect of the surface active metal is mainly a function of temperature and the deformation rate. Embrittlement and reduced strength are not connected with corrosion processes but are caused by a decrease of the work which is necessary for the development of crack nuclei due to the adsorption of surface-

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32803
S/137/61/000/012/124/149
A006/A101

Regularities and the mechanism ..

active metal atoms on the internal micro-surfaces. At a drop of the test temperature below T_s of the "base metal-coating" eutectics, the embrittling effect vanishes gradually, due to a reduced mobility of adsorption-active atoms. The embrittling effect vanishes also at sufficiently high temperatures and low tension rates, when the resorption of deformation micro-heterogeneities and local stresses prevents the failure nuclei to develop into dangerous cracks, even at a considerable decrease of free surface energy. There are 21 references.

V. Stepanov

[Abstracter's note: Complete translation]

Card 2/2

SHCHUKIN, Ye.D.; PERTSOV, N.V.; GORYUNOV, Yu.V.

Change in the mechanical properties, structure, and electric conductivity of metal monocrystals under the influence of a strong adsorption-active medium. Kristallografiia 4 no.6:887-897 N-D '59. (MIRA 14:5)

1. Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova.
(Zinc crystals)
(Cadmium crystals)
(Tin crystals)

SUMM, B.D.; GORYUNOV, Yu. V.; PERTSOV, N.V.; SHCHUKIN, Ye.D.; REBINDER, P.A., akademik

Development of cracks in a bent zinc plate associated with a local application of a liquid surface-active metal (mercury). Dokl. AN SSSR 136 no.6:1392-1395 F '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova i Institut fizicheskoy khimii AN SSSR.
(Zinc)
(Mercury)
(Deformations (Mechanics))

SUMM, B.D.; GORYUNOV, Yu.V.; PERTSOV, N.V.; SHCHUKIN, Ye.D.

Spread of mercury over a free zinc surface in connection with a study of strength reduction due to adsorption. Dokl.AN SSSR 137 no.6:1413-1415 Ap '61. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova. Predstavleno akademikom P.A.Rebinderom.
(Mercury) (Zinc)

PERTSOV, N. V. Cand Chem Sci -- "Effect of liquid surface-active metal platings upon the mechanical properties of [redacted] crystals of metals." Mos, 1953 (Acad Sci USSR. Inst of Crystallography). (KL, 1-61, 183)

S/020/61/136/006/021/024
B101/B203

18.8200 also 1418

AUTHORS: Summ, B. D., Goryunov, Yu. V., Pertsov, N. V., Shchukin Ye. D., and Rebinder, P. A., Academician

TITLE: Cracking in a bent zinc plate with local application of a liquid surface-active metal (mercury)

PERIODICAL: Doklady Akademii nauk SSSR, v. 136, no. 6, 1961, 1392-1395

TEXT: The authors deal with the problem of changing the mechanical properties of metals by the action of surface-active metals. The present paper reports on the action of small mercury drops on cracking in a bent zinc plate. Industrial zinc of the thickness δ = 0.8-3 mm and the width a of up to 50 cm was bent by a force F, as is shown in Fig. 1. In the place of Hg application, the stress p_m was only about 7-8 kg/mm^2 (tensile strength of Zn about 18 kg/mm^2). In the absence of Hg, no considerable residual deformations occurred after 10 min; at a higher load, the zinc could be bent at right angles. If, however, at a p_m of about 7 kg/mm^2 an Hg drop (mass m about 0.2-40 mg) was applied to the zinc surface

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polished by etching, a crack formed which, in a short time (1-2 sec), adsorbed the entire Hg, and rapidly extended perpendicular to p_m. The rate of extension decreased gradually, and was already very low after 5-10 min. The crack extended over the greater part of its length through the entire thickness δ of the plate. The final length L of the crack depended on the quantity of Hg. On the basis of concepts of the migration of Hg along the cracked surface and the diffusion of Hg into the cracked surface, the authors derived for the length L:
$L = A\delta^{-2/3}m^{2/3}$ (A = const). This equation was confirmed experimentally. Cracking showed three stages. At the first stage, the rate of cracking is constant and independent of m, the mass of the Hg drop. Hg is adsorbed, and distributed over the crack. With increasing volume of the crack, the Hg is no longer sufficient to fill it. This is the beginning of the second stage. Hg is distributed as a liquid phase only on the crack surface. The Hg migrates to the place of destruction, and diffuses into the crack surface at the same time. At the third stage, no more liquid Hg is present. The slow growth of the slit takes place through migration, the Hg adsorbed on the slit wall being redistributed.

S/020/61/136/006/021/024
B101/B203

Cracking in a bent zinc plate with local...

According to the authors' opinion, a detailed analysis of migration and diffusion, and the reduction in strength of metals under the action of surface-active melts, can be studied by means of such experiments. Furthermore, the kinetics and migration of adsorptive atoms will be studied. There are 4 figures and 4 Soviet-bloc references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov). Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

SUBMITTED: November 5, 1960

Card 3/4

SHCHUKIN, Ye.D.; PERTSOV, N.V.; ROZHANSKIY, V.N.

Investigating the irregularity of plastic deformations. Prib.i tekh.eksp. no.2:98-102 Mr-Ap '57. (MLRA 10:7)

1. Institut fizicheskoy khimii AN SSSR i Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V.Lomonosova.
(Deformations (Mechanics))

AUTHORS: Rozhanskiy, V. N., Pertsov, N.V., 20-5-14/48
Shchukin, Ye. D., Rebinder, P. A., Academician

TITLE: Effect of Thin Mercury Coatings on the Strength of Metallic Monocrystals (Vliyaniye tonkikh rtutnykh pokrytiy na prochnost' metallicheskikh monokristallov).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 5, pp. 769-771 (USSR)

ABSTRACT: At first the authors shortly report on respective literature. In the present works the monocrystals of zinc, tin, cadmium and lead (degree of purity 99.99 %, diameter 0.5 mm, length about 10 mm) were investigated. As surface-active substance served mercury which was applied in form of a thin coating by means of immerging the sample into an $Hg_2(NO_3)_2$-solution. The mercury covered the monocrystal with an equal film of about 0.1 μ thickness and was rapidly saturated with the metal to be investigated. The investigation of the strength properties of the amalgamated monocrystals in their expansion with constant velocity showed that the strength of the zinc- and tin- monocrystals covered with mercury was a few times less than the strength

of the non-amalgamated monocrystals. Such an abrupt decrease of strength is obviously connected with the important decrease of surface tension at the metal/mercury boundary as well as with the decrease of the production operation of a new surface at the crack. The investigation of axial ground sections of amalgamated zinc-monocrystals according to their deformation showed the following: The cracks can develop on the surface as well as in the interior of the monocrystal, which can be seen in observing the axial ground sections. The development of the cracks in the inner part can be connected with a noticeable diffusion of mercury into zinc (at room temperature) with subsequent decrease of the surface tension on the developing inner separation surfaces. The rise of temperature up to 160° C annihilates the above-mentioned phenomena of catastrophic brittleness with the zinc-monocrystals investigated and reconstitutes completely the plasticity and the strength. Also the decrease of the deformation velocity causes phenomena which are similar to those developing with the rise of temperature. The strength of the body decreases with the

decrease of the surface tension on the just produced crack surface, but it increases with the creation of conditions which prevent the accumulation of great dislocation avalanches near the possible potential barriers. There are 4 figures, and 11 references, 6 of which are Slavic.

ASSOCIATION: Chair for Colloidal Chemistry of the Moscow State University imeni M. V. Lomonosov (Kafedra kolloidnoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova).

SUBMITTED: July 10, 1957.

AVAILABLE: Library of Congress

PERTSOV, N. V.

ROZHANSKIY, V. N., GORUNOV, G. V., SCHUKIN, E. D., PERTSOV, N. V.

Moscow University, Institute of Physical Chemistry of the Acad. Sci., USSR, Moscow.

"Unhomogeneous Plastical Deformation and the Effect of Surface-Active Mediums on the Mechanical Properties of Crystals."
Paper submitted at
Program of the Conference on the Non-Metallic Solids of Mechanical Properties. Leningrad
May 19- 26, 1956.

1 11096-66 EWT(m)/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/HW

ACC NR: AP5026365 SOURCE CODE: UR/0370/65/000/005/0164/0169

AUTHOR: Loginskiy, M. G. (Moscow); Pertsovskiy, M. Z. (Moscow)

44
B

ORG: none

TITLE: Increasing the heat resistance of Ni by means of high temperature thermomechanical treatment

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1965, 164-169

TOPIC TAGS: mechanical heat treatment, dispersion hardening, heat resistance, tensile strength, annealing, yield stress

ABSTRACT: High temperature tensile tests were made on NP-2 Ni rods of 16 mm diameter. In addition to Co the Ni contained the following base impurities: 0.04% Mg, 0.02% Fe, 0.06% Si, 0.01% Mn, 0.03% Cu, 0.015% Zn and 0.014% S. The rods were given a preliminary annealing treatment of 3 hrs at 1100°C and subjected to high temperature thermomechanical treatment (HTTT) at 500, 700 and 900°C (6.7 m/min) which yielded a series of samples respectively reduced by compression to 2, 5, 10, 15, 20, 30 and 45%. Some samples were tested in the annealed state and others after deformation at 20°C. Experimental results are presented for both brief and protracted tests for tensile strength at 400° and 500°C. As the HTTT temperature increased, strength decreased. Maximum increases (1.5 and 2 times) were observed for HTTT at 500°C, and

UDC: 669.24-157.9

Card 1/2

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ACC NR: AP5026365

for cold working at 20°C--for the more heavily deformed (40 to 45%) samples. The yield stress was also found to increase more than the tensile strength; the best treatments resulted in increasing the yield to tensile strength ratio from 0.3-0.4 to 0.8-0.95. For short time testing the same general results were obtained at a somewhat lower test temperature (400°C). In the 100-hour tensile strength test, strengthening by HTTT was achieved after a deformation of more than 20%. At 45% deformation, the 100-hour strength of Ni at 500°C rose to 25.8, 26.6 and 30.8 (kg/mm^2) following HTTT at 900, 700 and 500°C respectively; after cold working, to 31.5 kg/mm^2. These values reflect an increase of 50-85% in strength. A schematic diagram illustrates the effect of preliminary plastic deformation at various temperatures on the heat resistance of metals and alloys. In no case did phase transformations or dispersion hardening occur. The low strength region in this diagram was for low deformation. Orig. art. has: 3 figures, 1 table.

SUB CODE: 11/ SUBM DATE: 08May65/ ORIG REF: 005/ OTH REF: 001

HW

Card 2/2

9.2572

S/194/62/000/005/148/157
D271/D308

AUTHOR: Pertsov, S.V.

TITLE: Some particular features of radio signal propagation in parametric systems based on solid-state diodes

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 5, 1962, abstract 5-7-256 1 (V sb. Poluprovodnik, pribory i ikh primeneniye no. 7, M., Sov. radio, 1961, 141-168)

TEXT: Expressions are derived for the parameters of a single-circuit parametric amplifier with solid-state diode used as a non-linear capacitance. Operation of the amplifier is analyzed separately for the cases of one or both output voltage harmonics being used. It is shown that, by making use of equivalent circuits, transients in the amplifier can be calculated by the method devised for the classical tuned amplifier, and that transmission band-width and relative off-tuning, exert principal influence on the character of transients in a parametric amplifier, in the same way as in the conventional amplifiers. 9 references. [Abstractor's note: Complete translation].

Card 1/1

32922
S/194/61/000/011/057/070
D271/D302

9.2572 (1139)

AUTHOR: Pertsov, S.V.

TITLE: Noise factor of parametric amplifiers with semiconductor diodes and methods for its rational reduction

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 12, abstract 11 K92 (V sb. Poluprovodnik. pribory i ikh primeneniye, no. 6, M., Sov. radio, 1960, 63-91)

TEXT: Basic requirements of front end stages of low noise receivers and noise characteristics of diode parametric amplifiers are considered. Formulae are derived for the noise factor of single- and double-circuit amplifiers and amplifier-converters. The influence of diode parameters on the amplifier noise factor is considered. Noise reduction methods are analyzed which permit amplifiers with noise characteristics not inferior to those of molecular amplifiers to be obtained. It is shown that the use of parametric amplifiers

Card 1/3

Noise factor of parametric...

in front of microwave receivers makes it possible to raise the threshold sensitivity of receivers to a potentially feasible level determined by external noise. The comparison of practical possibilities of molecular and parametric amplifiers leads to the conclusion that the latter have a greater future. The following are given: Noise characteristics of travelling wave microwave amplifiers, molecular and diode parametric amplifiers; the equivalent circuits of single- and double-circuit parametric amplifiers, of the amplifier-converter and of the semiconductor diode, in the microwave range; graphs illustrating operation of a single-circuit amplifier when the equality $f_s = \frac{f_p}{2}$ is not valid; the dependence of the parametric amplifier noise factor on cooling and on diode quality; the dependence of the amplifier noise temperature on the diode temperature; the dependence of the diode reverse current and of the amplifier noise factor on cooling and the diode quality; the dependence of the amplifier noise temperature on the diode temperature [Abstracter's note: This point is repeated twice in the original, probably by a misprint]; the de-

Card 2/3

32922

S/194/61/000/011/057/070
D271/D302

Noise factor of parametric...

pendence of the diode reverse current and amplifier noise factor on the bias voltage; a circuit of the system with a parametric amplifier at its input. 10 references. [Abstracter's note: Complete translation]

Card 3/3

ACC NR: AM5012952 Monograph UR/

Nikolayev, Andrey Grigor'yevich; Pertsov, Sergey Viktorovich

Detection of thermal radiation at radio frequency; passive radar (Radioteplolokatsiya; passivnaya radiolokatsiya) Moscow, Izd-vo "Sovetskoye radio", 1964. 0334 p. illus., biblio. 7,300 copies printed

TOPIC TAGS: passive radar, radar antenna, radar component, radar detection, thermal radiation, radio emission, IR radiation, radiometer, radiometry, radar noise, superhigh frequency, radar target

PURPOSE AND COVERAGE: This book is concerned with the theory and application of passive radar. The basic principles of utilization of natural thermal radiation at radio frequency for the determination of the coordinates and physical properties of targets are described, and data on this type of thermal radiation including methods for determining the coordinates of the radiators are given. Simple relationships for determining the parameters of the functional elements of radar units by range and detection probability or by the measurement accuracy of coordinates are derived. Various types of antennas, receivers, and indicators used in passive radar are described. The utilization of passive radar for military and economic purposes is discussed in detail. The book is intended for engineers

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and radar specialists, as well as for auditors and students taking advanced courses in radio engineering.

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ACC NR: AM5012952

SUB CODE: 17/ SUBM DATE: 30Nov64/ ORIG REF: 073/ OTH REF: 097

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S/194/62/000/004/079/105
D271/D308

9.2572

AUTHOR: Pertsov, S. V.

TITLE: Some properties of radio signal propagation through single-circuit parametric systems with solid-state diodes

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 4, 1962, abstract 4zh40 (V sb. Poluprovodniki, pribory i ikh primeneniye, no. 7, M., Sov. radio, 1961, 141-168)

TEXT: The author considers the passing of radio signals through a single-circuit parametric amplifier with a semiconductor diode. Two cases are analyzed: 1) When only one harmonic of the output voltage of parametric amplifier is utilized at the output of the system; 2) when two harmonics are utilized at the system output. It is shown that transitional processes in a single-circuit parametric amplifier can be determined and calculated by methods developed for conventional tuned amplieifers if the proposed equi-

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Some properties of ...

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valent circuits are employed. In a parametric amplifier, as in a conventional tuned amplifier, bandwidth and relative off-tuning exert the main influence on the course of the build-up. [Abstracter's note: Complete translation.]

Card 2/2

NIKOLAYEV, Andrey Grigor'yevich; FERTOV, Sergey Viktorovich; PERESLEGIN, S.V., retsenzent; FEDIN, V.T., retsenzent; KRASOVSKIY, A.A., prof., doktor tekhn.nauk, nauchn. red. MASHAROVA, V.G., red.

[Radar detection of thermal radiation; passive radar] Radioteplolokatsiia; passivnaia radiolokatsiia. Moskva, Sovetskoe radio, 1964. 334 p. (MIRA 17:12)

PERSON S V

PHASE I BOOK EXPLOITATION SOV/4677

Poluprovodnikovyye pribory i ikh primeneniye; sbornik statey, vyp. 5 (Semiconductor Devices and Their Application; Collection of Articles, No. 5) Moscow, Izd-vo "Sovetskoye radio," 1960. 270 p. No. of copies printed not given.

Ed. (Title page): Ya. A. Fedotov; Ed. (Inside book): I. M. Volkova; Tech. Ed.: A. A. Sveshnikov; Editorial Board: Ya. A. Fedotov (Resp. Ed.), N. A. Barkanov, I. G. Bergel'son, A. M. Broyde, Ye. I. Gal'perin (Deputy Resp. Ed.), Yu. A. Kamenetskiy, Yu. I. Konev, A. V. Krasilov, A. A. Kulikovskiy, I. F. Nikolayevskiy, and I. P. Stepanenko.

PURPOSE: This collection of articles is intended for specialists working in the field of semiconductor devices.

COVERAGE: The articles discuss basic transistor parameters, methods of measuring them, and some problems in the use of transistor circuit diagrams. Two of the articles describe the use of semiconductor diodes for parametric amplification. No personalities are mentioned. References accompany 11 of the 12 articles.

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KUPREVICH, V.F., glavnyy red.; ATRAKHOVICH, K.K., red.; LUKASHOV, K.I. [Lukashou, K.I.], red.; YARMOLENKO, M.F. [Iarmolenka, M.F.], red.; NESTSYAROVICH, M.D., red.; GLEBKO, P.F. [Hlebka, P.F.], red.; SUDNIK, M.R., red.; PERTSOV, U.M. [Pertsau, U.M.], red.; VINOKUROV, F.P. [Vinakurau, F.P.], red.; BYAL'KEVICH, P.I., red.; VALAKHANOVICH, I., tekhn.red.

[Science in White Russia during 40 years] Navuka u Belaruskai SSSR za 40 hod. Minsk, Vyd-va Akad.navuk BSSR, 1958. 475 p. (MIRA 12:3)

1. Akademiya navuk BSSR, Minsk.
(White Russia--Science)

PERTSOV V. V.

USSR /Chemical Technology. Chemical Products and Their Application
Control and Measuring Devices.
Automatic Regulation. H-3

Abs Jour: Referat Zhur - Khimiya, No 1, 1958, 1575

Author : Pertsov V., Suslov M.

Title : Automatic Regulator of the Rate of Filtration

Orig Pub: Zhil.-kommun. kh-vo, 1957, No 4, 14-17

Abstract: Description of the design, principle of operation, hydro-mechanic and electric hookup of the automatic regulator of filtration rate which has been developed by the All-Union Scientific Research Institute VODGEO. The use in the hookup of a master control-device makes it possible to carry out, simultaneously, a remote control regulation of the rate of filtration on several filters,

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KOLESNIKOV, A.; PERTSOV, V., inzh.

Consolidated mixed brigades in Baku enterprises. Sots. trud 6 no.6:110-11; Je '61. (MIRA 16:8)

1. Starshiy inzh. normativno-koordinatsionnogo otdela normativno-issledovatel'skoy stantsii Gosudarstvennogo ob"yedineniya Azerbaydzhanskoy neftyanoy promyshlennosti (for Kolesnikov). 2. Normativno-koordinatsionnyy otdel normativno-issledovatel'skoy stantsii Gosudarstvennogo ob"yedineniya Azerbaydzhanskoy neftyanoy promyshlennosti (for Pertsov).

BATYROV, R.; PE[illegible]

(1) work[illegible]

1. [illegible]

PERTSOV, V.

Automatic regulation of the operation of a hydraulic piston pump. (MIRA 14:8)
Neftianik 5 no.8:20 Ag '60.
(Oil well pumps)
(Automatic control)

PERTSOV, V.; BABAYAN, A.; SYROVATSKIY, A.; TSYTKO, M.

In the oil regions of our country. Neftianik 6 no.2:30-32 F '61. (MIRA 14:10)
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SUZDAL'SKIY, V., inzh.; ZEL'TSER, Yu., inzh.; PERTSOV, V., starshiy inzhener; KARBANOV, G.

Capron is used in the manufacture of machinery. Izobr. i rats. no.1:4-5 Ja '62. (MIRA 14:12)

1. Irkutskiy zavod tyazhelogo mashinostroyeniya (for Suzdal'skiy). 2. Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskogo mashinostroyeniya (for Zel'tser). 3. Azerbaydzhanskiy nauchno-issledovatel'skiy institut elektrotekhnicheskoy promyshlennosti (for Pertsov). 4. Predsedatel' Novgorodskogo oblastnogo soveta Vsesoyuznogo obshchestva izobretateley i ratsionalizatorov (for Karbanov).

(Machinery industry)
(Nylon)

SITNIKOV, I., neshtatnyy korrespondent (g.Ardatov, Mordovskoy SSR);
PERTSOV, V. (Baku); KARASIK, L. (Baku); AKHMETOV, A.

Unfolding of the struggle for the achievement of the yearly plan.
Mest.prom.i khud.promys. 4 no.2:1 F '63. (MIRA 16:2)

1. Direktor fabriki bumazhno-belovykh tovarov, Alma-Ata (for Akhmetov).

PERTSOV, V., kapitan

Officers prepare research papers. Komm.Vooruzh. Sil 1 no.13: 66-67 Jl '61. (MIRA 14:7)
(Russia--Army--Education, Nonmilitary)

PERTSOV, V.

Chinese petroleum workers on Cheleken Peninsula. Neftianik 2 no.8:35 Ag '57. (MIRA 10:10)
(Cheleken Peninsula--Oil well drilling)

PERTSOV, V.; SUSLOV, M., starshiy nauchnyy sotrudnik.

Automatic controller of the rate of filtration. Zhil-kom.khoz. 7 no.4:14-17 '57. (MLRA 10:7)

1. Upravlyayushchiy trestom "Vodokanalizatsiya," g. Ivanovo (for Pertsov). 2. Vsesoyuznyy nauchno-issledovatel'skiy institut vodosnabzheniya, kanalizatsii, gidrotekhnicheskikh sooruzheniy i inzhenernoy gidrogeologii (for Suslov).
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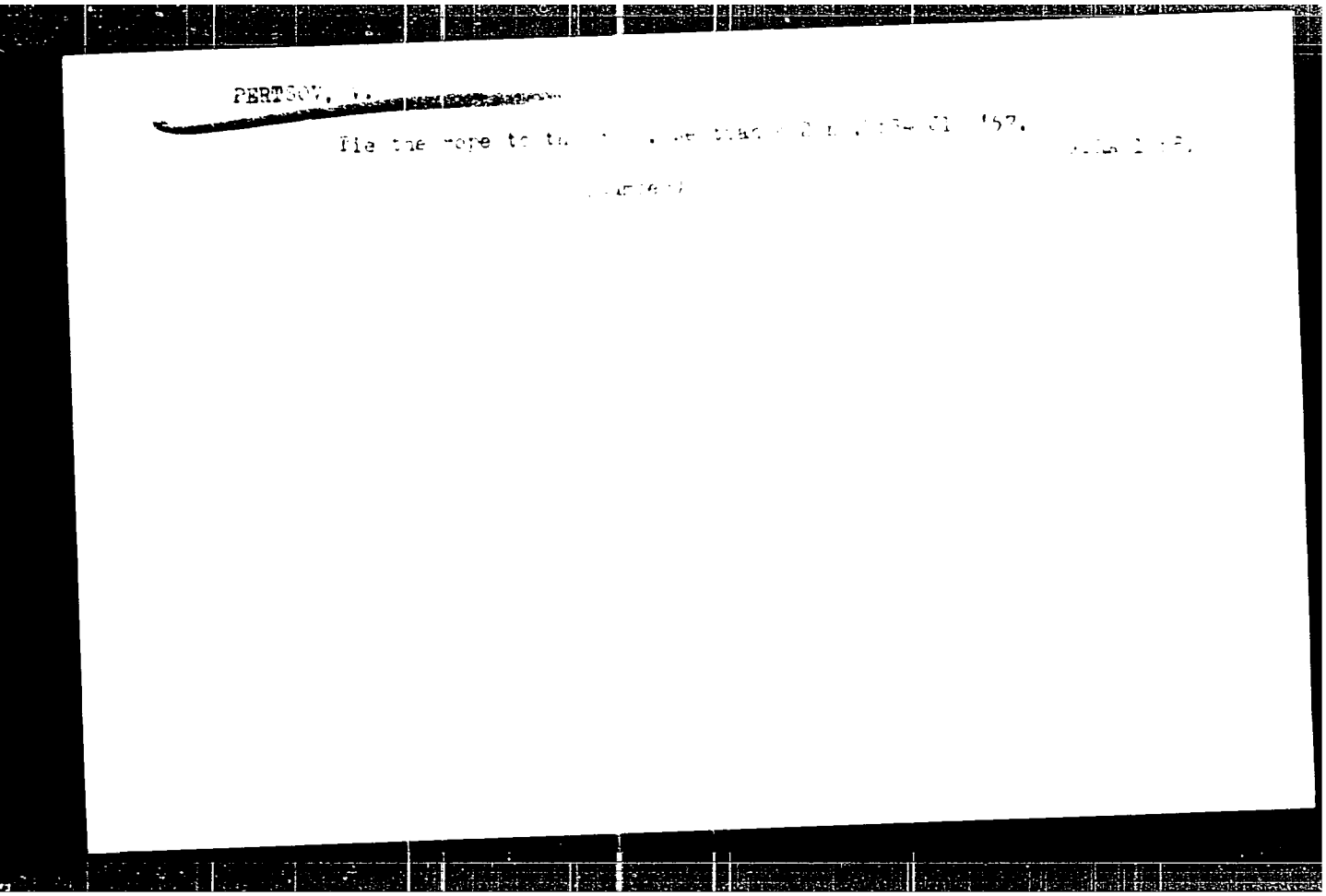

PEKTSOV, V. (Poluostrov Cheleken, Turkmenskaya SSR).

Oil field workers have saved the oil well. Pozh.delo 3 no.5:12 My '57. (MLRA 10:7)

(Cervish Peninsula--Oil fields)

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(Oil well drilling)

PERTSOV, V.A. (Krasnovodsk)

Anastasiia Ivanovna Grinenko. Med.sestra 15 no.6:28 Je '56.
(MLRA 9:8)

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Petroleum workers are scientists. Zdorov'e 7 no.7:3 Jl '61. (MIRA 14:6)

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One creel for two automatic warpers. Tekst.prom. 20 no.10:72 O'60.
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In a consolidated enterprise. Tekst.prom. 21 no.2:91 Ja '61.
(MIRA 14:3)
(Azerbaijan--Silk industry)

PERTSOV, V.A.

Redesigned bobbin holder for the SL-140-ShL warper. Tekst. prom. 22 no.11:46 N '62. (MIRA 15:11)

1. Starshiy inzhener Azerbaydzhanskogo nauchno-issledovatel'skogo instituta elektrotechnicheskoy promyshlennosti.
(Looms)

PERTSOV, V.A. (Krasnovodsk)

Feldsher G.K.Solov'eva. Fel'd. i akush. 21 no.3:41-42 Mr '56.
(MEDICAL SERVICE EMPLOYEES) (MLRA 9:7)