AUTHORS: Puzey, I. M., Molotilov, B. V., Rad'kov, A. I. SOV/48-22-10-16/23

TITLE: On Volumetrical Magnetostriction in Iron-Nickel-Molybdenum-Alloys (Ob"yemnaya magnitostriktsiya splavov zhelezo-nikel-molibden)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958, Vol 22, Nr 10, pp 1251 - 1253 (USSR)

ABSTRACT: A description of various devices used for the following work is to be found in reference 1. Special attention has been paid to the observation of isothermic conditions during the tests. The adiabatic process of magnetisation is known to hinder any adequate measuring of magnetostriction, chiefly owing to the magnetocaloric effect. Nickel has a negative volumetrical magnetostriction, so that its derivative $\partial A/\partial \omega$ is negative too. Thus some amount of nickel should be found on the descending branch of the Bethe curve. (Bete). Any reduction of the intermolecular distance should increase the Curie (Kyuri) point, especially if the average value of

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the variable integral is thereby increasing. That conclusion is corroborated by the measures of the displacement of the Curie point with pressure (Ref 5). Iron has a positive isotheric volumetric magnetostriction, so that iron should be found on the ascending branch of the Bethe curve. After such a coordination some alloys changed the index of volumetrical magnetostriction (alloy 86) or magnetostriction became neutral (alloys 88, 89, 90). Obviously those alloys should be found in the maximum area of the Bethe curve. Alloys involving a (modified) index in connection with thermal work should be found near the zero lines of the linear magnetostriction (Ref 1). Molybdenum-permalloy lies away from those lines. Its index of volumetrical magnetostriction remains unchanged. Furthermore the magnetostriction scarcely changes its magnitude in passing from the tempered to the annealed state. There are 3 figures, 1 table, and 5 references, 2 of which are Soviet.

On Volumetrical Magnetostriction in Iron-Nickel-Molybdenum-Alloys SOV/48-22-1o-16/23

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChERMET (Institute for Precision Alloys of the Central Scientific Research Institute for Ferrous Metals)

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AUTHOR: Pusey, I. M. SOV/20-120-4-22/67

TITLE: The Temperature Stabilization of the Magnetic Properties of Permalloy (Temperaturnaya stabilizatsiya magnitnykh svoystv permalloya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 4, pp.768-770 (USSR)

ABSTRACT: The present paper investigates the exact temperature dependence of the energy of the magnetic anisotropy of the alloy 78,3 % Ni, 17,9 % Fe, 3,8 % Mo. A single crystal bred from the melt served as a sample. The sample was of exact spherical shape and was annealed for 600 hours at temperatures of from 550 to 300° before being investigated. The first constant of magnetic anisotropy has a normal temperature dependence, like in the case of other metals, within the range of from 480° to 530° and more, i.e. the absolute value of this constant increases with decreasing temperature. From 480° to 530° the temperature dependence is "anomalous", i.e. the constant becomes smaller with decreasing temperature and changes its sign within the temperature interval of from

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The Temperature Stabilization of the Magnetic Properties of Permalloy

495 to 530°. Three hours' annealing apparently does not lead to equilibrium states. The investigation of polycrystalline molybdenum permalloy showed that magnetostriction in the state attained by quenching beginning at 600° is $+ 1,9 \cdot 10^{-6}$ and in the annealed state $+ 5,9 \cdot 10^{-6}$. Final thermal treatment at low temperatures consisted in rapid cooling down starting from 600°. The constant of isotropy obtained thereby increases with decreasing temperature. For the purpose of stabilizing permeability the material must be conveyed into a state with "anomalous" temperature dependence of the constant of magnetic anisotropy which compensates the damaging influence exercised by magnetistriction. The correctness of this conclusion was tested on the basis of two samples of standard molybdenum-permalloy 79 MM and another alloy which is described. A stabilizing treatment as described above reduces the temperature-sensitivity of permeability considerably, especially within the range of low temperatures. The here described method of stabilization is efficacious within the temperature range of from -196° to +100°. Stabilization can probably be still further improved. There are 3 figures, 1 table, and 5 references, 5 of which are Soviet.

SOV/20-120-4-22/67

The Temperature Stabilization of the Magnetic Properties of Permalloy

PRESENTED: May 8, 1957, by I. P. Bardin, Member, Academy of Sciences, USSR

SUBMITTED: May 6, 1957

1. Magnetic alloys--Magnetic properties 2. Magnetic alloys--Temperature factors 3. Magnetic alloys--Heat treatment 4. Magnetostriction --Temperature factors 5. Single crystals--Test results

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PHASE I BOOK EXPLOITATION SOV/5895

Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Institut pretsizionnykh splavov

Pretsizionnyye splavy (Precision Alloys) Moscow, Metallurgizdat, 1960. 203 p. (Series: Its: Sbornik trudov, vyp. 23) Errata slip inserted. 2,525 copies printed.

Additional Sponsoring Agency: USSR. Gosudarstvennaya planovaya komissiya.

Ed.: D.I. Gabrielyan; Ed. of Publishing House: Ye.I. Levit; Tech. Ed.: Ye.B. Vaynshteyn.

PURPOSE: This book is intended for engineers and scientific personnel in the metallurgical, instrument-production, and electrical-equipment industries, as well as for industrial personnel engaged in the production of precision alloys. It may also be useful to students attending advanced technical schools.

COVERAGE: The articles in this collection present the results of investigations conducted in recent years by the Central Scientific Research Institute of Ferrous Metallurgy (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii). The articles deal with industrial techniques of producing soft magnetic alloys, properties and structure of the alloys at extremely low temperatures and in high-frequency magnetic fields, deformation textures, magnetostriction, the galvanomagnetic effect, volume changes, etc. Some articles are concerned with the investigation of deformed hard magnetic alloys. No personalities are mentioned. The articles are accompanied by references, both Soviet and non-Soviet.

PUZEY, I. N

PHASE I BOOK EXPLOITATION SOV/5526

Vsesoyuznoye soveshchaniye po magnitnoy strukture ferromagnetikov, Krasnoyarsk, 1958.

Magnitnaya struktura ferromagnetikov; materialy Vsesoyuznogo soveshchaniya, 10 - 16 iyunya 1958 g., Krasnoyarsk (Magnetic Structure of Ferromagnetic Substances; Materials of the All-Union Conference on the Magnetic Structure of Ferromagnetic Substances, Held in Krasnoyarsk 10 - 16 June, 1958) Novosibirsk, Izd-vo Sibirskogo otd. AN SSSR, 1960. 249 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fiziki Sibirskogo otdeleniya. Komissiya po magnetizmu pri Institute fiziki metallov OFMN.

Resp. Ed.: L. V. Kirenskiy, Doctor of Physical and Mathematical Sciences; Ed.: R. L. Dudnik; Tech. Ed.: A. F. Mazurova.

PURPOSE: This collection of articles is intended for researchers in ferromagnetism and for metal scientists.

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Magnetic Structure (Cont.) SOV/5526

COVERAGE: The collection contains 38 scientific articles presented at the All-Union Conference on the Magnetic Structure of Ferromagnetic Substances, held in Krasnoyarsk in June 1958. The material contains data on the magnetic structure of ferromagnetic materials and on the dynamics of the structure in relation to magnetic field changes, elastic stresses, and temperature. According to the Foreword the study of ferromagnetic materials had a successful beginning in the Soviet Union in the 1930's, was subsequently discontinued for many years, and was resumed in the 1950's. No personalities are mentioned. References accompany individual articles.

TABLE OF CONTENTS:

24.2200 (1068, 1160, 1164)
18.8100 4016, 1418, 1555

33574
S/194/61/000/012/069/097
D273/D303

AUTHORS: Puzey, I. M., Lutoshkin, V. M. and Rad'kov, A. I.

TITLE: Investigating the dynamics of domain structure in ultrasonic fields

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 14, abstract 12E82 (V. sb. 'Magnitn. struktura ferromagnetikov'. Novosibirsk, Sib. otd. AN SSSR, 1960, 155-164)

TEXT: The influence of ultrasonics on ferromagnetics leads to a relaxation change of domain structures, accompanied by a change of modulus of elasticity and also of velocity of the ultrasound. At relaxation times and large periods of ultrasonic waves, the domain structure does not have any influence on the velocity of the ultrasound. In the case of application of a strong magnetic field, the domain structure is destroyed and the velocity of the ultrasound changes, relative to the sample, to a zero field. There takes place a dispersion of velocity. The passage of ultrasonic pulses through

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Investigating the dynamics ...

tostriction). Dispersion curves are drawn for nickel, iron and transformer steel, with measurements not of absolute value of velocity, but of its change on the application of a magnetic field. There is an increase in velocity with one in frequency in the range 16 Kc/s to 3 - 4 Mc/s. For nickel, hardened steel and iron, curves are obtained of the dependence of the damping constants of ultrasound on the value of the magnetic field at frequencies of 100 Kc/s and 1 Mc/s with a maximum damping at the beginning of the curve. Maximum damping and minimum velocity in weak fields are explained by the increased permeability of the submagnetic state. There is obtained the frequency dependence of the damping constant for iron (at a frequency of 180 Kc/s there is a maximum) and for transformer steel (absorption spectrum). 11 figures. 13 references. [Abstractor's note: Complete translation.]

Card 3/3

S/120/60/000/01/030/051
E201/E391

AUTHORS: Puzey, I.M. and Sabinin, P.G.

TITLE: Electromagnets for Physico-chemical Studies

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 1, pp 104 - 109 (USSR)

ABSTRACT: In 1950-1955 the authors designed and constructed two laboratory-type electromagnets (Refs 6,7). The first of them is shown schematically in Figure 1. All its parts, except the wrought pole-pieces, were made of cast armco iron. The yoke of this electromagnet was a section of a tube in which two conical (53° cone angle) cores were mounted. The maximum diameter of the poles was 150 mm and the maximum gap between them was 90 mm. To produce a uniform field between the pole-pieces the latter were slightly recessed, as suggested by Rose (Ref 8). The electromagnet weighed about 1 500 kg. Figure 2 shows the magnetic fields obtainable with this electromagnet as a function of the number of ampere-turns. For a 17 mm gap and a pole-piece diameter of 30 mm the field was about 32 000 Oe at the gap centre and for a 30 mm gap and

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Electromagnets for Physico-chemical Studies

a pole-piece diameter of 50 mm the field was about 23 000 Oe. When a 50 mm gap, recessed at the centre to 54 mm, was employed with pole-pieces of 78 mm diameter the field at the gap centre was about 14 000 Oe; all the three field values just quoted were obtained with 80×10^3 ampere-turns. The second (improved) electromagnet is shown schematically in Figure 4 and its photograph is reproduced in Figure 6. This electromagnet weighed 3 500 kg. The cores were again in the form of truncated cones with the cone angle of 85°; the largest and smallest diameters of the cones were 530 and 230 mm and their height was 170 mm (Figure 5). The "legs" and the pole-pieces of the electromagnet were made of wrought iron purer than armco iron. Figure 7 shows the magnetic fields in air gaps obtainable with the second electromagnet. By adjusting the position of the "legs" highly uniform fields could be obtained (from 10 000 Oe for a gap of 120 - 130 mm and a pole-piece diameter greater than 200 mm).

S/120/60/000/01/030/051
E201/E391

Electromagnets for Physico-chemical Studies

In a small gap (5-6 mm) and with pole-pieces of 10 mm diameter, fields up to 50 000 Oe could be obtained. All these values were obtained with 180-200 x 10^3 ampere-turns. The total power which had to be supplied to the second electromagnet amounted to 10 - 18 kW. Both the first and the second electromagnets were mounted so that they could easily be rotated about a vertical axis passing through the centre of the gap. The second electromagnet was found to be satisfactory in laboratory investigations, such as studies of anisotropy, etc. Acknowledgments are made to P.G. Sabinin and M.M. Suchkova for the design work connected with the electromagnets and to I.P. Bardin (deceased) for his help in construction. There are 7 figures, 1 table and 12 references, 5 of which are Soviet, 4 English, 2 German and 1 French.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific-research Institute for Ferrous Metallurgy)

SUBMITTED: December 22, 1958
Card3/3

S/058/61/000/011/018/025
A058/A101

AUTHOR: Puzey, I. M.

TITLE: Investigation of the magnetic anisotropy energy of nickel

PERIODICAL: Referativnyy zhurnal, Fizika, no. 11, 1961, 241, abstract 11E517 ("Sb tr. Tsentr. n.-i. in-t chernoy metallurgii", 1960, no. 23, 139-149)

TEXT: The temperature dependence of the anisotropy constants K_1 of a single crystal composed of 99.92% Ni, 0.035% Co, 0.008% Fe, 0.02% Cu, 0.009% S, 0.03% C and 0.001% P and having a specific weight of 8.926 g/cm at 20°C was studied by the mechanical moment method in the range from -252.8° to +271.8°C. It was established that at -252.8°C in a field H = 11,250 oersteds $K_1 = -103.4 \cdot 10^4$ erg/cm^3, while for extrapolation to H = ∞ $K_1 = -105.36 \cdot 10^4$ erg/cm^3. With increasing temperature the curve of K_1 versus T decreases monotonously in absolute magnitude, and at high temperatures changes sign; $K_1 = 0$ at 217°C. Above this temperature up to +272°C the value of K_1 is small ($\sim$ 300 erg/cm^3). Thus, the possibility of a change in sign of K_1, which was predicted by S. V. Vonsovskiy (Zh. eksperim. i teor. fiz., 1938, no. 8, 1104) was substantiated

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Investigation of the magnetic anisotropy ...

for Ni. With increase of the magnetizing field H from 11,250 to 17,120 oersteds for T = -252.8°C the K_1 constant increases linearly in absolute magnitude from $-105.36 \cdot 10^4$ to $-105.65 \cdot 10^4$ erg/cm^3, which is consistent with the deductions of S. V. Tyablikov and A. A. Gusev (RZhFiz, 1957, no. 4, 9504).

N. Smol'kov

[Abstracter's note: Complete translation]

Card 2/2

24.2300

28556
S/137/61/000/009/038/087
A060/A101

AUTHORS: Puzey, I.M., Molotilov, B.V.

TITLE: Magnetostriction of nickel-iron-molybienum alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 9 '61, 11, abstract 9Zh64 ("Sb. tr. Tsentr. n.-i. in-t chernoy metallurgii", 1960, no. 23, 150 - 160).

TEXT: The magnetostriction of Ni-Fe-Mo alloys is investigated as a function of ordering and temperature. The measurement of magnetostriction was carried out by the bridge method. Tensometers were connected in all four arms of the bridge (two of them working, two for compensation). The working tensometers were glued onto different sides of the specimen. The magnetostriction was measured in the electromagnet ИПС-1 (IPS-1) in fields up to 17,000 oersteds. Both polycrystalline and monocrystalline specimens of alloys obtained in vacuum from the melt were investigated. It was established that the ordering leads to the displacement of the zero line ($\lambda = 0$) towards the Ni side, but no more than 1%. The magnetostriction constants of four single crystals having compositions close to the zero values of magnetostriction are cited. In the case of single crystals

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S/137/61/000/009/038/087
A060/A101

Magnetostriction of nickel-iron-molybdenum alloys

the displacement of the zero line also takes place. The construction of the zero lines $\lambda_{100} = 0$ and $\lambda_{111} = 0$ on the phase Ni-Fe-Mo triangle made it possible to make the μ-region more precise. All alloys the compositions of which lie in that region have physical constants such as to favor the obtaining of a high permeability. Despite the low value of magnetostriction of the alloys investigated ($\sim 10^{-6}$), it was possible to investigate its temperature dependence. For poly- and mono-crystalline specimens magnetostriction decreases monotonously as the temperature increases.

A. Rusakov

[Abstracter's note: Complete translation]

Card 2/2

MOLOTILOV, B.V.; PUZEY, I.M.; RAD'KOV, A.I.

Magnetostriction by change in volume of iron-nickel-molybdenum alloys. Sbor.trud.TSNIICHM no.23:161-165 '60. (MIRA 13:7)

(Iron-nickel-molybdenum alloys--Magnetic properties)
(Magnetostriction)

S/126/60/009/02/020/033
E062/E335

AUTHOR: Puzey, I.M.

TITLE: Special Features of the Temperature Dependence of the Magnetic Anisotropy Energy of Fe-Al Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 279-282 (USSR)

ABSTRACT: The author had previously pointed out (Refs 1,2) certain anomalies (e.g. maxima, reversals of slope and of sign) in the temperature dependence of the magnetic anisotropy energy of (Ni, Fe, Co) alloys near their magnetically isotropic condition. The temperature variation (from -196 to 400 °C) of the anisotropy constant is now reported for the case of both annealed and quenched samples of Fe-Al alloys (7.4 to 16% Al). Peculiar features are observed and explained in terms of the ordering process and also of the difference between the magnetic moments of Fe atoms surrounded by 8 Fe atoms and those surrounded by 4 Al and 4 Fe atoms. There are 6 figures and 12 references, 6 of which are Soviet, 1 German, 1 French and 4 English.

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM (Institute for Precision Alloys, TsNIIChM)

SUBMITTED: July 6, 1959

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66634

S/126/60/009/02/025/033
E073/E335

19.1141

AUTHOR: Puzey, I.M.

TITLE: Features of the Temperature Dependence of the Energy of the Magnetic Anisotropy of Crystals in the Neighbourhood of the Magnetically Isotropic State

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 302 - 303 (USSR)

ABSTRACT: In earlier work (Refs 1,2) the author found that in the neighbourhood of the magnetically isotropic state single crystals of binary Fe-Ni, Ni-Co, Fe-Co alloys and also molybdenum permalloy, within a certain temperature range, a temperature dependence was observed for the constant of magnetic anisotropy which is similar to that observed by Bozort for MnBi and Mn_2Sb (Ref 3). This can be explained as follows. According to S.V. Vonsovskiy and Ya.S. Shur (Ref 4), in addition to the energy and natural anisotropy U_o, it is necessary to take into consideration the elastic one plus the magnetic elastic energy, which is determined by the following expression in cubic crystals:

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S/126/60/009/02/025/033
E073/E335

Features of the Temperature Dependence of the Energy of the Magnetic Anisotropy of Crystals in the Neighbourhood of the Magnetically Isotropic State

$$U_1 = \frac{9}{4}(C_{11}\lambda_{100}^2 - C_{12}\lambda_{100}^2 - 2C_{44}\lambda_{111}^2)f(S_iS_j)$$

where C_{11}, C_{12}, C_{44} are elasticity moduli and $\lambda_{100}\lambda_{111}$ are magnetostriction constants. If λ_{100} and λ_{111} are small, the temperature characteristic of the anisotropy energy is determined by the behaviour of the energy of the natural anisotropy U_o in the same way as for molybdenum permalloy (Ref 1), where changes in the near range order of the solid solution bring about radical changes in the temperature dependence.. In particular, there will be a change in the sine of the constant and a reversal of the temperature dependence, formation of a maximum although the elastic properties and

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Features of the Temperature Dependence of the Energy of the Magnetic Anisotropy of Crystals in the Neighbourhood of the Magnetically Isotropic State

the magnetostriction change little. A reverse temperature dependence, a maximum or minimum, can also be due to other causes, particularly in the case of large values of λ_{100} and λ_{111}. U_1 can be of the order of 1 000 erg/cm^3 and differs in sine from that of U_o, whereby the total energy $U_o + U_1$ may equal zero for a certain concentration. It is assumed that $U_o < 0$, $U_1 > 0$ and $U_o + U_1 > 0$. If the dependence of U_o and U_1 on the temperature is the usual one but $|dU_o/dt| > |dU_1/dt|$, then the temperature characteristics of $U_o + U_1$ will be reverse ones, i.e. the anisotropy energy will decrease with increasing temperature. A reverse temperature dependence and a change in sine are possible also for some other

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E073/E335

Features of the Temperature Dependence of the Energy of the Magnetic Anisotropy of Crystals in the Neighbourhood of the Magnetically Isotropic State

relations between U_o and U_1 and their derivatives.

The elastic plus the magneto-elastic energy have a strong influence on the temperature of the anisotropy energy in such alloys as Fe-Co, Ni-Co and others, which have a high magnetostriction.
There are 4 Soviet references.

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM (Institute of Precision Alloys, TsNIIChM)

SUBMITTED: March 5, 1959, initially,
May 18, 1959, after revision.

Card 4/4

S/028/60/000/010/014/020
B013/B063

AUTHORS: Gabrielyan, D. I., Klevitskaya, G. Z., Puzey, I. M.

TITLE: Magnetically Soft Precision Alloys

PERIODICAL: Standartizatsiya, 1960, No. 10, pp. 48-51

TEXT: This is a report on a standard worked out at the Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy) for magnetically soft precision alloys, which classifies precision alloys into five groups: 1) 45 Н (45N) and 50 Н (50N) with increased permeability and high magnetic saturation; 2) 50 НП (50NP), 65 НП (65NP), 34 НКМП (34NKMP), and 47 НМП (47NMP) have a high maximum permeability and a crystallographical or magnetic texture; 3) 50 НХС (50NKhS), 38 НС (38NS), and 42 НС (42NS) have an increased permeability and a high electrical resistance; 4) 79 НМ (79NM), 80 НХС (80NKhS), 78 Н (78N), 76 НХД (76NKhD), 80 НХ (80NKh), 74 НМД (74NMD), and 79 НМА (79NMA) have a high permeability in weak fields; 5) 50 КФ (50KF) has the highest saturation induction. 45N, 50N, 50NP, 65NP, 50NKhS, 79NM, 80NKhS, and 50KF are well-known standardized alloys, which are produced

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in a great variety and in large quantities. Table 1 compares technical data of the alloys specified in the above standard with foreign alloys. It may be seen that only the alloys 50N and 50NP have poorer magnetic properties than the Western alloys 5000HZ and Hypernic. The alloys 50NKhS and 80NKhS, developed at the Institut pretsizionnykh splavov TsNIIChermet (Institute for Precision Alloys of TsNIIChermet) are unmatched. The alloys 47NMP, 34NKMP, 38NS, 42NS, 78N, 76NKhD, 80NKh, and 74NMD, whose production has been started right now, will not be standardized and are produced according to technical specifications. The standard described here is based on various technical specifications, ГОСТ 5572-50 (GOST 5572-50), abundant material made available by manufacturers, results of research work done at the Institute for Precision Alloys, and many data from foreign publications. Magnetically soft materials are characterized by many parameters of which the standard considers the original and the maximum permeability, the coercive force, saturation induction, and, in some cases, the "orthogonality" of the hysteresis loop. Furthermore, the standard specifies the dimensions, tolerances, and the surface state of the metal, taking into account the possibilities of the manufacturer's equipment. The static magnetic characteristics of these

Magnetically Soft Precision Alloys

S/028/60/000/010/014/020
B013/B063

alloys have been improved as compared with the valid GMTY5010-55 (ChMTU 5010-55). The characteristic properties of magnetically soft materials mentioned in the standard do not limit the technical possibilities but serve as technical parameters for manufacturers and consumers. Table 2 and 3 give the principal properties of the alloys specified in the standard. There are 3 tables.

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GABRIELYAN, D. I.; KLEVITSKAYA, G. Z.; PUZEY, I. M.

Magnetically-soft precision alloys. Standartizatsiia 24 no.10:48-51 O '60. (MIRA 13:10)

(Alloys--Magnetic properties)

ALIKHANOV, R. A., Institute for Physical Problems imeni S. I. Vavilov, Academy of Sciences USSR, Moscow - "Neutronographic study of $NiCO_3$" (Section J-2)

BELOV, N. V., Associate Director, Institute of Crystallography, Academy of Sciences USSR, Moscow - "Magnetic (ferromagnetic) space group symmetry" (C-6)

BELOV, N. V., NERONOVA, N. N., Both Institute of Crystallography, Academy of Sciences USSR, Moscow, DONNAY, J. D. H., Johns Hopkins University, Baltimore, Md., and DONNAY, G. H., Geophysical Laboratory, Carnegie Institution, Washington, D. C. "Tables of magnetic space groups, II. Special positions" (C-6)

BOROVIK-ROMANOV, A. S., Institute for Physical Problems imeni S. I. Vavilov, Academy of Sciences USSR - "Antiferromagnetic resonance in carbonated of transition elements" [sic] (M-16)

BOROVIK-ROMANOV, A. S., ALEKSANYAN, G. G., RUDASHEVSKIY, G. Ye. - "Piezomagnetic effect in antiferromagnets" (M-18)

KONDORSKIY, Ye. I., Head, Magnetism Laboratory, Moscow State University - (1) "The electrical and galvanomagnetic properties of thin films at very low temperatures" (M-5); (2) "On the connection between the spontaneous magnetization of current carriers and the Nernst-effect in ferromagnetic metals" (M-4); "The exchange interaction and magneto-effects in ferrite-garnets" (M-15)

USSR (cont.)

LOBACHEV, B., and VAYNSHTEYN, B., Institute of Crystallography, Moscow - "Electron diffraction study of thiourea CO $(NH_2)_2$"

LYASHENKO, B. G., Central Scientific Research Institute of Metallurgy, Moscow - "The problem of the influence of spontaneous magnetization on crystal structure and phase state of alloys" (M-8)

LYASHENKO, B. G., LIVITIN, D. F., [illegible], ABOV, Yu. G. Central Scientific Research Institute of Metallurgy, Moscow - "Neutron diffraction investigation of order-disorder in the alloys 'Ferrum-nickel and ferrum-cobalt'" (J-1)

OZEROV, R. P., KOGAN, V. S., ZHDANOV, G. S., Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov, Moscow - "Neutron diffraction study of the structure of solid hydrogen and deuterium" (C-8)

PINSKER, Z. G., Institute of Crystallography, Academy of Sciences USSR, Moscow - "Results and progresses of electron diffraction analysis" (C-11)

FUZEY, I. M., Scientific Research Institute of [illegible]rgy, Moscow - "Magnetic anistropy in monocrystals of Ni-Fe-Co alloys" (M-9)

SHUR, Yakov S., Scientific Research Institute of Metallurgy, Moscow - "Some problems of the physics of high coercive materials" (M-17)

SMOLENSKIY, G. A., Institute of Semiconductors, Leningrad - "Some investigations of non-metallic ferro and antiferromagnetics" (M-13)

VAYNSHTEYN, B. K., Institute of Crystallography, Academy of Sciences USSR - "Development of electron diffraction method" (C-11)

YAMZIN, I. I., BELOV, N. V., NOZIK, Y. Z., Institute of Crystallography, Moscow - "Atomic and magnetic structures of magnese ferrite" (J-2)

VONSOVSKIY, S. V., Institute of the Physics of Metals, Academy of Sciences USSR, Sverdlovsk. A member of the IUPAP Commission on Magnetism. See paragraph 1 of Comment for a complete listing of members of the Commission. "Some investigations of Soviet physics on the theory of ferromagnetism for the last years" (Invited paper. Section M-11)

paper to be submitted for the IUPAP Intl. Conference on Magnetism and Crystallography, Kyoto, Japan, 25-30 Sep 1961

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27847
S/133/61/000/008/016/025
A054/A129

18.1210 2408 1530 4016

AUTHORS: Puzey, I.M.; Pluchek, B.Ya.; Suvorov, V.A.

TITLE: High-permeable iron-aluminum alloys of 1012 (Yu12) and 1012K (Yu12K) grades

PERIODICAL: Stal', no. 8, 1961, 742 - 744

TEXT: The application of iron-aluminum alloys as magnetic and structural materials is discussed in Reference 1 (A.M. Samarin, Elektrichestvo, no. 7, 1960). A Soviet alloy prepared by B.G. Livshits, N.G. Lakhman and K.V. Emmil [Ref. 4: Trudy TsNIIChM (Transactions of the TsNIIChM), v. 23, 1960, 194] contains 14 - 15% Al and some additions of molybdenum and manganese. This alloy displays high magnetic properties after hardening from 600°C in water. A new Soviet iron-aluminum alloy was also developed with a high permeability and ordered structure, containing only 12% aluminum and 88% iron. The test metal was molten in an induction vacuum furnace (magnesite crucible) from armco iron and AB-000 (AV-000) type aluminum. Pouring into sheet bars took place in argon atmosphere. After slow heating to 1,000°C the sheet was rolled to 2.5 mm thickness without any intermediate heating, next the strips were heated to 600°C and rolled to 0.35 mm

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High-permeable iron-aluminum alloys of....

(with smooth edges). The magnetic tests were carried out on toroidal samples with an internal diameter of 20 mm and an external diameter of 30 mm. Figure 2 shows the dependence of maximum magnetic permeability and coercitive force of the alloy on its aluminum content after annealing in vacuum at 1,100 and 1,250°C for 1 h with cooling to 600°C at a 100°C/h rate and the 300°C for 3 h. Minimum coercitive force and a very steep peak of maximum permeability were obtained with a 12-% aluminum content. The peak is narrow and is caused by the sharp decline of the curve of dependence of anisotropy constants on the alloy's composition. The study of the relationship between maximum permeability of the 12-% aluminum alloy and 1-hour annealing shows that permeability increases with the rise in temperature:

Annealing temperature, °C	1,000	1,100	1,200	1,250
μ_{max}, 10^3 gauss/oersted	12	18	72	128

The study of specific electric resistance of iron-aluminum alloys with 12 - 13% aluminum content depending on thermal treatment showed that minimum electric resistance was found in alloys after hardening in water. When hardening in oil, resistance is a little higher. Long-term annealing increases the electric resistance of alloys containing less than 11.5% aluminum. Upon increasing the aluminum content, electric resistance rapidly decreases. Alloys with a 12-% aluminum con-

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Highpermeable iron-aluminum alloys of....

tent, after being cooled to 200°C at a 50°C/h rate and subsequently in furnace, have a specific electric resistance of 1.07 ohm · mm^2/m. Tests were also carried out with alloys containing 2% cobalt besides 86% iron and 12% aluminum. The table shows that the binary Yul2 and tertiary Yul2K alloys could be obtained with ordered magnetic properties, approximating those of the high-nickel-containing permalloys. The Yul2 and Yul2K alloys have a higher electric resistance (above 1 ohm · mm^2/m) and a lower specific gravity (6.8 g/cm^3) than those containing nickel. They have also a high resistance to corrosion and plastic deformation after annealing, and are, moreover, isotropic. Compared with the 50H (50N), 50HXC (50NKhS) and 38HC (38NS) nickel-alloys the iron-aluminum alloys display a steeper permeability curve and are magnetized in fields of a much lower voltage. The watt-losses are lower in the new alloys due to their high electric resistance. They are suitable for transformer cores working at high frequencies, for magnetic amplifier cores, stators, runners and whenever a high chemical resistance is required. There are 4 figures, 1 table and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: J.F. Nachman, J.W. Buchler, Journal of Applied Physics, 1954, v. 25, no. 3, 307; J.F. Nachman, J.W. Buchler, Electrical Manufacturing, 1956, no. 11; M. Hansen, R. Anderno, Constitution Diagram of Binary Alloys, N.Y., 1958.

ASSOCIATION: TsNIIChM

Card 3/5

S/126/61/011/004/004/023
E073/E535

AUTHOR: Puzey, I. M.

TITLE: Dependence of the Energy of Magnetic Anisotropy of Invar on the Temperature and the Field

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.4, pp.525-528

TEXT: Invar has a number of anomalous physical properties: a large magnetostriction, a low coefficient of thermal expansion, a high susceptibility of the paraprocess, a flat temperature dependence of the saturation and a possible "latent" antiferromagnetism. R. M. Bozorth (Ref.3) determined the constant of the magnetic anisotropy of invar at room temperature but no data are given in the literature on the temperature and field dependence of this constant. The author determined the anisotropy constant of invar (monocrystalline sphere of 10.720 ± 0.0005 mm diameter) in the temperature range from the hydrogen temperature up to 320°C in fields between 6000 and 23 000 Oe. The temperature dependence of the anisotropy constant, measured in a field of 10^3 Oe, for invar containing 36% Ni, rest Fe is plotted in Fig.1 (10^3 erg/cm^3 vs. temperature, °C). The curve is similar to the corresponding curve

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for Ni, i.e. a sharp rise at low temperatures and a change in the sign at +100°C. The dependence of the anisotropy constant on the field strength at various temperatures is plotted in Fig.2, K, erg/cm^{-3} vs. H, Oe (curve 1: -252.7°C, curve 2: -195°C, curve 3: +19.1°C, curve 4: +81.2°C, curve 5: +114.2°C, curve 6: +263.7°C, curve 7: +175.5°C). For both positive and negative values, the constant increases with increasing field intensity. In the temperature range 70 to 120°C changes in the field strength leads to a change in the sign of the constant. The absolute increase in the anisotropy constant with increasing temperature on increasing the field strength from 6000 to 22000 Oe becomes less pronounced as the Curie point is approached but the relative change in the constant decreases rapidly. Thus, at the liquid hydrogen temperature it is 7.7%; at the nitrogen temperature it is 8.2%; at room temperature it is 50% and at 81.2°C it is almost 1000%. According to data obtained earlier by the author of this paper (Ref.4), the change in the constant of nickel for the here investigated field range was 3.8% and at room temperature this magnitude equals 9%. According to L. V. Kirenskiy, R. S. Nosova and N. V. Reshetnikova (Ref.10), the value of 9%

should remain right up to 135°C. Thus, there is an anomalous dependence of the anisotropy constant on the field of invar as compared to nickel and this is attributed to a strong paraprocess. There are 2 figures, 2 tables and 10 references: 8 Soviet and 2 non-Soviet.

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM
(Institute of Precision Alloys TsNIIChM)

SUBMITTED: July 30, 1960

√

Fig.1

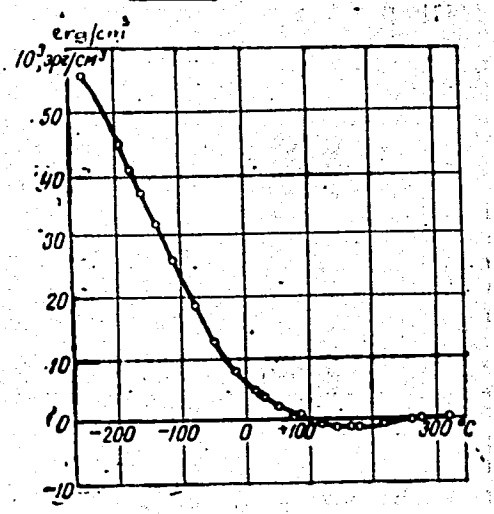
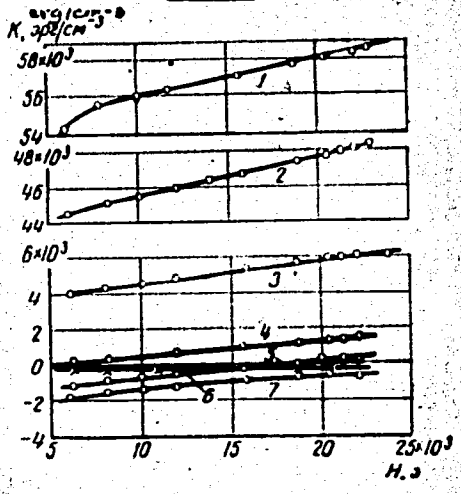


Fig.2



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22960

S/126/61/011/005/005/015
E073/E535

18.1141

AUTHOR: Puzey, I. M.

TITLE: Dependence of the Energy of Magnetic Anisotropy of Iron-Nickel Crystals on the Temperature

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.5, pp. 686-692

TEXT: The aim of the work was to investigate systematically the temperature dependence of the anisotropy constant of iron-nickel alloys in the γ-phase range and also the influence of heat treatment on this dependence. This is considered particularly important since the heat treatment influences the structure of the γ solid solutions within a wide range of nickel concentrations. The experiments were made on single crystal spheres of 7 to 11 mm diameter produced from the melt. Specimens 1,2,3 and 12 contained 100, 88.4, 85.5 and 35.0 at.% Ni (for these the k(T) curves are not given in the paper). Specimens 4,5,8,9,10 and 11 contained 82.5, 76.7, 70.5, 65.5, 52.4 and 43.8 at.% Ni, respectively. In earlier work (Ref.1: Izv.AN SSSR, ser.fiz., 1952, 16, No.5, 549) in which specimens 1-11 were investigated at

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room temperature, the dependence of the constant on the composition as regards Ni_3Fe showed an asymmetry in the ordered state. Therefore, the author considered it of interest to get more accurate information for specimens with compositions approaching Ni_3Fe. For this purpose specimens 5-7 were again chemically analysed after the tests (the results were practically the same as before). Furthermore, the orientation of the crystal axes was measured with an accuracy of $\pm 1°$. In addition to high temperature annealing, the specimens were subjected to the following two types of heat treatment: 1) Heating to 600°C followed by cooling to 300°C for 15-20 days (this is referred to as "annealing"); 2) heating to 700°C and quenching in water ('quenching'). The invar specimen was annealed at 1000°C in vacuo in a quartz ampoule and was then cooled in air together with the ampoule. For determining the anisotropy constant, the mechanical moment was measured which acts at various temperatures on the single crystal in the plane (100) for 24 orientations of the magnetic field, differing by steps of 15°. From the obtained results the fourth harmonic was determined and the anisotropy constant calculated. The accuracy of measuring the angle was 7.5 min, the accuracy of

measuring the mechanical moment was 0.2%. Since 24 moments were measured, the accuracy of determining the anisotropy constant is almost five times as high as it would be if a single reading was used. The torque was measured in a magnetic field of 10 000 Oe; for nickel at low temperatures a field in excess of 17 000 Oe was applied and the results were extrapolated for an infinitely strong field by a method described in earlier work of this author. The temperature was determined by means of a platinum resistance thermocouple with an accuracy of 0.1°. The temperature dependence of the constant of the anisotropy energy (K) was measured on face-centred single crystals in the temperature range -252.8 to +250°C. At the edge sections of the γ-phase a strong temperature dependence was detected at low temperatures and an inversion of the sign at high temperatures. In the neighbourhood of the zero values of the constant, corresponding to the composition approaching Ni_3Fe, an "anomaly" was observed in the "quenched" specimens, i.e. a non-monotonous character of the temperature dependence. This "anomaly" ceased after the specimens had been transformed into the ordered state by annealing, as a result of which there is a strong increase in the anisotropy energy, asymmetrical with respect to Ni_3Fe, at all temperatures.

Smoluchowski (Ref.14: J. phys. et rad., 1951, 12, 389) expresses the view that the asymmetry is caused by the influence of the exchange energy on the process of ordering. Since this energy increases with increasing Fe content, the ordering energy in the alloys will be asymmetrical relative to the Ni_3Fe composition, which leads to an asymmetry in the phase curve of order-disorder transformation. Apparently this is the cause of asymmetry of the temperature dependence of the anisotropy constant. There are 8 figures, 1 table and 14 references: 8 Soviet and 6 non-Soviet. The references to English-language publications read as follows: Bozorth, R.M. Rev. Mod. Phys., 1953, 25, 42; Dillinger, J., Bozorth, R. Physics, 1935, 6, 279; Bradley, A.J., Jay, A.H., Teilor, A. Phil. Mag. 1937, 23, 155, 545.

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM
(Institute of Precision Alloys TsNIIChM)

SUBMITTED: August 12, 1960

S/126/61/012/003/017/021
E073/E335

AUTHOR: Puzey, I.M.

TITLE: Influence of Cu, Si, Cr and Mo on the magnetic anisotropy and the saturation induction of Ni-Fe single crystals

PERIODICAL: Fizika metallov i metallovedeniye, v. 12, no. 3, 1961, 453 - 455

TEXT: The single crystals were prepared and investigated as described in an earlier paper by the author (Ref. 1 - AN SSSR, ser. fiz., 1952, 16, no. 5, 540). All the data given relate to specimens that have been water-quenched from 600 °C. A part of the phase diagram of the Ni-Fe-Cu system is plotted in Fig. 1 - the dashed lines represent the lines of constant saturation induction, based on results published by O. Anwers and H. Neuman (Ref. 2 - Wiss. Veröffentl. a.d. Siemens Werke, 1935, 14, no. 2, 93); the arrows indicate the magnitude and sign of the anisotropy constant. Due to the limited solubility of Cu (5.5%), single crystals containing up to 5% Cu only were prepared. By utilizing data of the anisotropy energy for Ni-Fe

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alloys and by carrying out a linear extrapolation for the range of 3% changes in the content of Ni and Fe, a zero anisotropy line was plotted, which is approximately parallel to a constant Ni content line. Similar data for the system Ni-Fe-Mo are plotted in Fig. 2 (composition, at.%; 2×10^3 erg/cm^3; 8 kgauss); the lines of constant induction are plotted from data obtained both by the author and by Bozorth. The lines of zero anisotropy are based on data entered as arrows and on data obtained for Ni-Fe alloys. The lines of constant induction and zero anisotropy form small angles with the base line (Ni side) and are inclined in opposite directions. The position is similar for Ni-Fe-Cr alloys; in alloys with Cr the induction and isotropy lines are somewhat steeper than in alloys with Mo. Fig. 4 shows a similar diagram for the system Ni-Fe-Si (contents, at.%). All the alloys with Cr which were investigated had a negative anisotropy constant. The isotropy compositions are to the right of these and the isotropy line should be inclining towards the Fe corner of the diagram. It was of interest to note that with increasing content of Si the anisotropy constant K increases.

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Thus, for a content of 11.6 at.% Si and 70.9 at.% nickel $K = -6.23 \times 10^4$ erg/cm^3, i.e. higher than for Ni, although the saturation induction of such an alloy is B_s = 5 300 gauss, i.e. lower than for Ni. The results show that from the point of view of decreasing saturation induction, the alloying elements can be grouped in the following sequence: Cu; Si; Cr; Mo. For these four elements the saturation-induction gradient along the line of a constant Ni:Fe ratio of 2.7 is 150, 550, 600 and 900 gauss/at.%, respectively. The ratio of these gradients is 1:3.7:4.0:6.0 at room temperature. In the case of binary alloys of Ni with the same elements, the ratio of the gradient is 1:4:4.4:5.5 (low temperatures) (Ref. 4 - C. Sadron, Ann. de Phys., 1932, 17, 371; Ref. 5 - V. Marian, Ann. de Phys., 1937, 7, 459). Thus, the ratio of the gradient remains approximately equal. For binary Ni-base alloys with Cu, Zn, Al, Si, Sb and Mo, the change in the saturation was explained by E.C. Stoner (Ref. 6 - Phil. Mag., 1933, 15, 1018) and N.F. Mott, H. Jones (Ref. 7 - Theory of the Properties of Metals and Alloys, Oxford,

1936). According to them, the electrons of the outer shells of the admixture atoms become transferred into the 3d-shell of the Ni atoms due to the more satisfactory arrangement of their energy states, and compensate each magnetic moment by 1 Bohr magneton. As has been shown in earlier work of the author and N.S. Akulov, in Ni-base binary alloys (Ni-Cu, Ni-Mo, Ni-Sn) the anisotropy constant decreases with the composition in the same ratio as saturation. As a result, the curves of the saturation-dependence of the anisotropy constant are similar. From this, the conclusion is drawn that charges of Cu, Sn and Mo ions have no specific influence on the anisotropy constant and that their effect manifests itself through electron concentration and, in final analysis, through the average magnetic moment of the Ni atoms, since the Cu, Sn and Mo atoms have no magnetic moment. On transition from the Cu region to the Cr and Mo region, the negative anisotropy decreases appreciably. The line of isotropy is always more inclined to the base line at the Ni corner of the diagram. The Ni:Fe content ratio along the anisotropy line increases. For ternary alloys and concentrations of Cu, Cr and

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Mo between 0 and 2.5% this ratio changes, respectively, between 2.6 - 2.9, 2.6 - 4.6 and 2.6 - 4.8. Assuming that even in ternary alloys the charges of Cu, Cr and Mo ions have no appreciable influence on the anisotropy constant, at least when present in small concentration, the conclusion can be drawn that in ternary alloys with Cu, Cr and Mo magnetic neutralization primarily of the Ni component will occur since the range of negative anisotropy narrows to an increasing extent on transition from Cu to Mo (in binary Ni-Fe alloys the range of negative anisotropy energy extends between 100 and 72.5% Ni). Si alloys behave differently. The isotropy line is inclined towards the Fe side of the diagram and the negative anisotropy is greater than in Cu-containing alloys. This is explained by the fact that the heat of formation of a solid solution of Si in Fe is 20 kcal/g.atom, that of Si in Ni being 37 kcal/g.atom. This is apparently why in Ni atoms which are adjacent to Si atoms, transition of the electrons into the 3d-shell is energetically less favourable, as a result of which the range of

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negative anisotropy becomes wider. The conclusions could be checked by measuring partial magnetic moments in alloys by neutron-diffraction methods but such data have not been published. There are 4 figures and 10 references: 4 Soviet-bloc and 6 non-Soviet-bloc. The English-language references are quoted in the text. [Abstracter's note: this is a complete translation.]

ASSOCIATION: TsNIIChM im. I.P. Bardin

SUBMITTED: December 13, 1960

[Abstracter's note: this is a complete translation.]

Card 6/7

PUZEY, I.M.; PLUCHEK, B.Ya.; SUVOROV, V.A.

Highly permeable IU12 and IU12K iron-aluminum alloys. Stal' 21 no.8:743-744 Ag '61. (MIRA 14:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
(Iron-aluminum alloys--Magnetic properties)

31606
S/048/61/025/012/015/022
B117/B104

18.9500

AUTHOR: Puzey, I. M.

TITLE: Crystal and magnetoelastic energy of anisotropy and its dependence on temperature in iron-nickel monocrystals

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1494 - 1497 - 1961 —

TEXT: The course of temperature of the anisotropy constant of a series of monocrystals in the high-temperature range, and the physical cause of sign alteration of the anisotropy constant in the nickel and invar range were studied. Spherical monocrystal samples grown from the melt by slow cooling were first investigated. The method of investigation is described in previous works. The samples were quenched after annealing at high temperatures. Two sections, in which the sign of the anisotropy constant changes, were found to exist in the face-centered phase of Fe-Ni alloys. The first section starts with pure nickel and includes alloys with a nickel content of up to 85%, the temperature of isotropy rising with decreasing nickel content. The second section comprises compositions with a 30 to

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Crystal and magnetoelastic ...

55-60% nickel content. On the first section, the negative anisotropy constant becomes positive, and on the second, the positive change into a negative one. It was assumed that this alteration of signs was caused by the magnetoelastic component of the energy of anisotropy. Therefore, the following was investigated on monocrystals of Fe-Ni alloys: (1) moduli of elasticity and their dependence on the temperature and on the field; (2) magnetostriction parameters and their dependence on the temperature and on the field. The following monocrystals were investigated: (1) 100% of Ni, 0% of Fe; (2) 76% of Ni, 24% of Fe; (3) 80% of Ni, 20% of Fe; (4) 36% of Ni, 64% of Fe. In summary, the following was found: In the range of compositions showing a high nickel content, magnetoelastic energy is positive; it is negative from the side of invar; the total energy of anisotropy is negative in the range of nickel, and positive in the range of invar. The moduli of elasticity change relatively slightly with temperature. Magnetostriction changes linearly. Since magnetoelastic energy is a square function of the magnetostriction constants, it will decrease considerably more slowly than the crystal energy. This leads to an alteration of the signs of the anisotropy constant at high temperatures since the

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signs of magnetoelastic and crystal energies are different. The author thanks V. I. Goman'kov, V. N. Gorbachev, and A. I. Rad'kov for assisting in measuring elastic and magnetostriction constants. There are 5 figures and 7 references: 4 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: Alers, G. A., Neighbour, J. R., Sato, H., J. Phys. Chem. Solids, 13, no. 1 - 2, 40 (1960); Rose F. C., Phys. Rev. 45, 50 (1936).

X

Card 3/3

S/776/62/000/025/003/025

AUTHOR: Puzey, L. M.

TITLE: The temperature dependence of the magnetic-anisotropy energy of single crystals of Iron-Nickel alloys.

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov. no.25. Moscow, 1962. Pretsizionnyye splavy. pp. 53-70.

TEXT: The present experimental investigation is a continuation of the author's earlier study of the energy of magnetic anisotropy of Fe-Ni single crystals at room temperature (AN SSSR, Izv., ser. fiz., no.16, 1952, 549). The present work investigates the temperature (T) dependence of the anisotropy constant of the Fe-Ni alloys and the effect of heat treatment on that dependence. The specimens were in the shape of a single-crystal sphere, 7 to 11 mm diam ± 0.0005 mm. The chemical composition of the specimens is tabulated. Chemical analyses were made before and after the tests to detect any changes therein. The orientation of the crystallographic axes was determined by the magnetic method with an accuracy of ± 1°. The HTs are specified in detail. The magnetic-anisotropy constant was measured by means of the mechanical moment that acts in the single crystal in the plane (100)

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for 24 positions of the magnetic field (MF), i.e., at 15° intervals. The values of the mechanical moments were used to determine the fourth harmonic and therefrom to calculate the anisotropy constant. Measurements made with increasing and decreasing T showed that there was no hysteresis attributable to thermal inertia, at least at the slow heating and cooling rates employed. The field utilized has 10,000 ϕ, except that a field of 17,000 ϕ was used for the Ni at low T. The results of the measurements are detailed in a 3-page table and are illustrated in 11 graphs. The anisotropy constant of Ni grows very steeply with decreasing T. Upon addition of Fe and quenching, the steepness of the curve decreases with the approach to the isotropic alloy, whereupon it steepens again up to the invar alloys, in which it attains the same value as for Ni. In the ordered state the T dependence remains great, even in the region of the stoichiometric composition; it is greater for alloys with 74.3 at-% Ni and 70.5% Ni than for the alloy with 75% Ni. The sign reversal of the anisotropy constant, which is characteristic of Ni at high T, is not observed up to 300°, even in an alloy with 88.4 at-% Ni. Inasmuch as at such concentrations no long-range order is observed, we are dealing here apparently with transformations of the short-range type. In the alloy with 85.5 at-% Ni, the anneal and quench curves diverge considerably more. At a temperature of 258°, ordering processes are observed in the alloy, and the quench curve takes a steep turn toward an approach to the anneal curve. All of this occurs within 30 min, the time of heating

The temperature dependence of the magnetic- S/776/62/000/025/003/025

from 175 to 258°. This transformation is characteristic for short-range-order transformations. The peculiarity of the anomalous dependence of the anisotropy constant on the T in the region of the stoichiometric alloy is discussed in detail. There are 13 figures, 1 table, and 11 references (7 Russian-language Soviet, 1 French, and 3 English-language).

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S/776/62/000/025/004/025

AUTHORS: Puzey, I.M., Rad'kov, A.I.

TITLE: Investigation of the dispersion of ultrasound in ferromagnetic substances.

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov. no. 25. Moscow, 1962. Pretsizionnyye splavy. pp. 71-85.

TEXT: This experimental investigation deals with the profound effect that the interrelationship between elastic and magnetic phenomena exerts on the passage of ultrasonic (US) waves through ferromagnetics. US affects primarily the domain structure in a manner analogous to a magnetic field, so that there is a displacement of the boundaries between domains. This displacement remains reversible with small amplitudes. The present investigation deals with the dynamics of the action of US on the domain structure, which - because of the absence of any effect analogous to the skin effect of the magnetic field - is considerably more deeply penetrating for the US field than for the magnetic field. The action of the US on the domain structure leads to its relaxational change, a concomitant ΔE effect, and, hence, an alteration of the speed of propagation of the US. When the relaxation time is appreciably greater than the period of the US waves, the domain structure will not exert a sub-

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stantial effect on the rate of propagation of the US waves, that is, in that event, the material will behave as though it were nonferromagnetic. The same occurs if a strong magnetic field is superimposed on a breakdown of the domain structure. Details of the making of the rods (electrolytic Ni 000, Armco Fe, Mo Permalloy, and transformer steel with 4% Si) is detailed. The US tests were made at frequencies from tens of kcps to several mcps in the presence of various MF (up to 10,000 ϕ). The HTof the specimens is identified. A block diagram of the testing equipment is shown, and typical oscillograms, depicting the interference pattern under "in-phase" and "counterphase" conditions, are shown. In all of the materials investigated a velocity minimum and a damping maximum of the US waves was observed in the initial region of the fields which, apparently, corresponds to a magnetization of 30-50% of the saturation value. This effect is attributed to a more ready mobility of the domain boundaries upon the imposition of a magnetic field. When the field eliminates their resistance to motion, the permeability of the material increases sharply. This occurs in all ferromagnetics. A decrease of the speed of US in Ni in the region of strong fields is attributed to the appearance of macroscopic circular Foucault currents. This hypothesis is discussed in some detail. As expected, there is a damping maximum at a certain critical frequency which in Fe appears at 180 kcps and in Permalloy at 20 kcps. Another critical frequency is found for the maximum of magnetic losses in a variable magnetic field.

* HT: Abbreviation for heat treatment.

This frequency must coincide with the critical frequency of the damping of the US waves, since both of them are a result of the relaxational characteristics of the displacement of the domain boundaries, regardless of the nature of the force under the effect of which this displacement occurs. A great difficulty encountered was the complexity of the spectrum of proper frequencies of the rods employed in the experiments, the mathematical theory for which does not admit any exact expression. This difficulty was overcome by measuring not the absolute speed of the US waves, but its changes with the imposition of a magnetic field at various frequencies, a procedure which afforded a possible determination of the dispersion curves. The absolute speed is then determined by adding the speed in a magnetic field at the basic frequency of a rod and the speed produced by the effect of the given magnetic field. Other difficulties occurred with the broadening of the resonance lines, which reduced the resolving power of the method. There are 15 figures and 11 references (8 Russian-language Soviet, 1 German, and 2 English-language).

GOMAN'KOV, V.I.; LITVIN, D.F.; LOSHMANOV, A.A.; LYASHCHENKO, B.G.; PUZEY, I.M.

Neutron diffraction determination of the temperature dependence of the arrangement of atoms in a FeCo alloy. Kristallografiia 7 no.5:788-790 S-O '62. (MIRA 15:12)

1. Institut pretsizionnykh splavov TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii imeni Bardina.
(Iron-cobalt alloy) (Neutron diffraction crystallography)

PUZEY, I.M.

New field of high permittivity alloy compositions in the system Fe - Ni - Mo. Fiz. met. i metalloved. 14 no.3:374-377 S '62. (MIRA 15:9)

1. Institut pretsizionnykh splavov TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Iron-nickel-molybdenum alloys--Magnetic properties)

PURZEY, I. M., GOMANKOV, V. I., and LOSHMANOV, A. A.,

"Neutron Diffraction Studies of Atomic Magnetic Moments of Fe, Ni, Co in Alloys."

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

GOMAN'KOV, V.I.; LITVIN, D.F.; LOSHMANOV, A.A.; LYASHCHENKO, B.G.; PUZEY, I.M.

Neutron diffraction examination for determining the temperature dependance of the atomic order in the FeCo alloy. Ukr. fiz. zhur. 8 no.2:268-270 F '63. (MIRA 16:2)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii i Institut metallovedeniya i fiziki metallov, Moskva.
(Neutron diffraction crystallography) (Iron-cobalt alloys)

PUZEY, I.I.

Dependence of the nickel anisotropy constant on temperature and magnetization saturation. Fiz. met. i metalloved. 16 no.1:29-32 Jl '63. (MIRA 16:9)

1. Institut pretsizionnykh splavov TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Nickel--Testing) (Anisotropy)

PUZEY, I.M.

Magnetic anisotropy in single crystals of iron-cobalt-nickel alloys. Fiz. met. i metalloved. 16 no.2:179-183 Ag '63. (MIRA 16:8)

1. Institut pretsizionnykh splavov TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Metal crystals--Magnetic properties)
(Anisotropy)

PUZEY, I.M.

Field dependence of the anisotropy constant of single crystals of nickel and nickel-iron alloys. Izv. AN SSSR. Ser. fiz. 27 no.12:1469-1473 D '63. (MIRA 17:1)

1. Institut pretsizionnykh splavov Instituta novoy metallurgicheskoy tekhnologii imeni I.P. Bardina.

ACCESSION NR: AP4011770 S/0181/64/006/001/0294/0296

AUTHORS: Miryasov, N. Z.; Puzey, I. M.

TITLE: Study of induced magnetic anisotropy in Ni-Zn-Cr ferrite containing CoO

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 294-296

TOPIC TAGS: Ni-Zn-Cr ferrite, CoO inclusion, induced magnetic anisotropy, magnetic anisotropy, uniaxial anisotropy, anisotropy constant

ABSTRACT: The influence of temperature on the constant (K_u) of induced uniaxial anisotropy and on the spontaneous magnetization (I_s) of a ferrite was studied. Experiments were conducted on Ni-Zn-Cr ferrite in the temperature range of -196 to 300C. Field dependence of K_u was investigated in the interval of 3-21 kilooersteds at -196, 20, 90, and 200C. The magnitude order of K_u and its linear relation to I_s^2 agreed with the theory of directed ordering. The work was conducted in order to verify previously obtained results. Anisotropy was studied by the method of turning moments, and the specimen under investigation was a sphere 10.7350 ± 0.0005 mm in diameter, magnetized for 5 hours at 300C in the field of an electromagnet. It was determined that (with the drop of temperature) the value of K_u increased

ACCESSION NR: AP4011770

within the range of 10^2-10^4 erg/cm^3. This magnitude of K_u agreed with the theory of directed ordering. The differential dK/dT reached a maximum near 0°C and dropped to zero 0°K. It was further determined that below 50C the relation between K_u and I_s^2 is linear. A slight deviation from this relation at higher temperatures was caused by an additional magnetization along the field. A series of experiments on another specimen showed that with sufficiently high fields K_u increased directly with the field intensity. Orig. art. has: 3 graphs and 2 formulas.

ASSOCIATION: Fizicheskiy fakultet MGU im. M. V. Lomonosova (Physics Department MGU); In-t pretsizionny*kh splavov TsNIIChM (Institute of Precise Alloys TsNIIChM)

SUBMITTED: 17Jun63 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: PH. NO REF SOV: 005 OTHER: 005

Card 2/2

ACCESSION NR: AP4028437 S/0181/64/006/004/1100/1103

AUTHORS: Semenovskaya, S. V.; Umanskiy, Ya. S.; Puzey, I. M.; Granovskiy, Ye. B.

TITLE: Investigating the phonon spectrum of nickel by diffuse scattering of x rays

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1100-1103

TOPIC TAGS: phonon, nickel, diffuse scattering, x ray, elastic wave, sound velocity, elastic constant, ferromagnetic property, multiphonon scattering, goniometer RKSO, ionizer URS 50 IM, counter MST 17

ABSTRACT: The authors determined the dependence of frequency on the wave vector for longitudinal and transverse waves propagated along the symmetry directions— [100], [110], and [111] at room temperature. The initial segments of the dispersion curves permit approximate determination of the velocity of sound. The velocities thus obtained agree with average values determined ultrasonically within 7% or less. The computed values of the elastic constants (in dynes/cm^2)— $2.45 \cdot 10^{-12}$ for c_{11}, $1.6 \cdot 10^{-12}$ for c_{12}, and $1.14 \cdot 10^{-12}$ for c_{44}—are in good agreement with data from the literature. The dispersion in Ni is found to be much

Card 1/2

ACCESSION NR: AP4028437

greater than in Al and Cu, as reported in the literature. This fact apparently derives from the ferromagnetic nature of Ni and is due to spin-phonon interaction. The authors note that the precision in measuring the phonon spectrum is related to the precision in determining multiphonon scattering, and they point out some sources of error in applying corrections for multiphonon scattering. The corrections have a higher degree of validity for Al than for Ni. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 23Oct63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: SS,MM NO REF SOV: 001 OTHER: 010

Card 2/2

ACCESSION NR: AP4023387 S/0048/64/028/003/0440/0443

AUTHOR: Puzey, I.M.; Goman'kov, V.I.; Loshmanov, A.A.

TITLE: Neutron diffraction determination of atomic magnetic moments in iron-nickel alloys containing Mo, Si and Cu /Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.3, 1964, 440-443

TOPIC TAGS: neutron diffraction, atomic magnetic moments, permalloy, impure permalloy, Mo permalloy, Si permalloy, Cu permalloy

ABSTRACT: The magnetic moments of Fe and Ni in 8 alloys of the permalloy type containing up to several percent Mo, Si or Cu were determined by the diffuse neutron scattering method of C.G.Shull and M.K.Wilkinson (Phys.Rev.,97,305,1955). The measurements were undertaken because of the interesting fact that both Fe and Ni have larger magnetic moments in their alloys than in the pure metals, and because there is evidence (I.M.Puzey, Fizika metallov i metallovedeniya,12,No.3,453,1961) that Mo and Si differently affect the magnetic moments of Fe and Ni in these alloys. The apparatus has been described elsewhere (V.I.Goman'kov, D.F.Litvin, A.A.Loshmanov

Card 1/2

ACCESSION NR: AP4023387

and B.G.Lyashchenko, Fizika metallov i metallovedeniy,14,26,1962). The alloys were prepared from electrolytic metals, were forged into bars, and quenched from 700°C in water to obviate ordering. Correction was made for the effect of multiple magnetic Bragg scattering. This correction was evaluated by extrapolating measurements on four samples of the same composition but different size to zero sample size. The measurements were performed at 77°C. The results are shown in the table below, which gives the decrease in the magnetic moments of Fe and Ni, in Bohr magnetons per percent admixture. It can be seen that Si affects Fe more strongly than does Mo

	Fe	Ni
Mo	.01	.07
Si	.03	.03
Cu	.00	.03

and Mo affects Ni more strongly than does Si. Measurements with colder neutrons will be required to elucidate the mechanism of this effect. "In conclusion, the authors thank B.G.Lyashchenko, D.F.Litvin and A.V.Doroshenko for assistance in the work." Orig.art.has: 2 figures and 2 tables.

Card 2/2

GORMAN'KOV, V.I.; PUZEY, I.M.; LOSHMANOV, A.A.

Study of the superstructure of Ni_3Fe. Kristallografiia 10 no.3: 416-418 My-Je '65. (MIRA 18:7)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii imeni I.P. Bardina.

KIRENSKIY, L.V.; NEDELKO, A.A.; BURAVIKHIN, V.A.; PUZEY, I.M.

Thin films of iron-gadolinium alloys. Izv. AN SSSR. Ser. fiz. 29 no.4:689-694 Ap '65. (MIRA 18:5)

1. Irkutskiy gosudarstvennyy pedagogicheskiy institut.

ACC NR: AP6035723 (N) SOURCE CODE: UR/0413/66/000/019/0085/0085

INVENTOR: Puzey, I. M.; Petrenko, E. D.

ORG: none

TITLE: Iron-cobalt-nickel base magnetic alloy. Class 40, No. 186698 [announced by the Central Scientific Research Institute of Ferrous Metallurgy im. I. P. Bardin (Tsentralnyy nauchno-issledovatel'skiy institut chernoy metallurgii)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 19, 1966, 85

TOPIC TAGS: magnetic alloy, iron cobalt nickel alloy, molybdenum containing alloy, nickel base alloy, ferroalloy, cobalt alloy, magnetic property, electric property

ABSTRACT: This Author Certificate introduces an iron-cobalt-nickel base magnetic alloy. To combine the increased values of magnetic and electric properties in order to obtain rectangular hysteresis loops or a linear dependence of induction on the field intensity in the range of 0 to 10,000 gs, the alloy has the following chemical composition in %: 0.03 max carbon, 0.3 max silicon, 0.3—0.6 manganese, 27.5—31.0 iron, 24—27 cobalt, 4—6 molybdenum, remainder - nickel.

SUB CODE: 11/ SUBM DATE: 21Jul65/

Card 1/1 UDC: 669.018.5:669.15'24'25-194

L 50909-65

ACCESSION NR: AP5011460 UR/0048/65/029/004/0689/0694

AUTHOR: Kirenskiy, L.V.; Nedel'ko, A.A.; Buravikhin, V.A.; Puzey, I.M.

TITLE: Thin films of iron-gadolinium alloys /Report, Second All-Union Symposium on the Physics of Thin Ferromagnetic Films held in Irkutsk 10-15 July 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 4, 1965, 689-694

TOPIC TAGS: ferromagnetic thin film, iron alloy, gadolinium alloy, domain structure, hysteresis loop, magnetic property

ABSTRACT: The study was undertaken in view of the growing interest in rare-earth metals and their alloys. The paper gives the results of investigation of the

Card 1/2

L 50989-65

ACCESSION NR: AP5011460

all cases is Gd; the indicated limits are based on tested films so that the actual percentages corresponding to changes in behavior may be different.) The films of

Puzey, O.V.

MIRETSKAYA, R.L.; SNIGIREVA, O.V.; SAMSONOVA, N.F.; PUZEY, O.V.

Distribution of opisthorchiasis in Chernigov Province. Med.paraz. i paraz.bol. 27 no.1:110 Ja-F '58. (MIRA 11:4)

1. Iz parazitologicheskogo otdela Chernigovskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.
(CHERNIGOV PROVINCE--DISTOMATOSIS)

DUBININ, V., mekhanizator; PUZEY, Ye., mekhanizator; FAUSTOV, N., mekhanizator; SHUTENKO, N., mekhanizator; KOGAY, K. mekhanizator; ISABEKOV, I., mekhanizator.

Doing more today means having more tomorrow. Sov. profsoiuzy 18 no. 11:13-14 Je '62. (MIRA 15:6)

1. Sovkhoz "Cheklarskiy", TSelinnogo kraya (for Dubinin). 2. Sovkhoz "Minskiy" TSelinnogo kraya (for Puzey). 3. Sovkhoz "Khar'kovskiy" TSelinnogo kraya (for Faustov). 4. Sovkhoz "Smirnovskiy" TSelinnogo kraya (for Shutenko). 5. Sovkhoz "Bozaygirskiy" Tselinnogo kraya (for Kogay, Isabekov).
(Virgin Territory--Tractors--Repairing) (Socialist competition)

S/058/63/000/003/087/104
A059/A101

AUTHOR: Puzewicz, Zbigniew

TITLE: Waveguide modes in open waveguide structures

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 26, abstract 3Zh155 ("Proc. Vibrat. Probl. Polish Acad. Sci.", 1962, v. 3, no. 1, 89 - 116, English, summaries in Polish and Russian)

TEXT: The propagation of waves of the waveguide mode (WM) (i. e. fast waves transmitting independent fluxes of finite power) in open waveguide structures formed by a cylindrical system of ideal conductors is studied. All waveguide structures are subdivided into three types for each of which the nature of the Laplacian operator spectrum is studied by the methods of functional analysis, and the possibilities of existence of WM waves are clarified. As a result, the following unified classification of structures is obtained: 1) quasi-conical structures - on the area free of conductors of the cross section S of structures of this type, a circle of the greatest possible radius is provided; the Laplacian operator spectrum is continuous; the existence of WM waves is im-

Card 1/2

S/058/63/000/003/087/104
A059/A101

Waveguide modes in open waveguide structures

possible; 2) quasi-cylindrical structures - on the area S, an infinite number of non-overlapping circles of finite radius can be placed; the Laplacian operator spectrum can be partly discrete; the existence of WM waves is not excluded, but they never form a complete system; 3) quasi-closed structures - all that do not belong to the first two classes; the Laplacian operator spectrum is discrete and WM waves form the complete system, in the general case only for TM-type fields. The characteristics of symmetrical band structures were investigated by variation methods. It was shown that the WM waves can propagate both in closed and in open (quasi-cylindrical) structures of this kind. The diagrams of the dependences of the critical wavelengths on the dimensions of the structures are given. The data of the theoretical calculation are confirmed experimentally. There are 18 references.

V. Gil'denburg

[Abstracter's note: Complete translation]

Card 2/2

MORAWSKA, Zuzanna; PUZIEWICZOWA, Izabella

Behavior of 17-ketosteroids in urine during therapy of rheumatic disease with sodium salicylate. Pediat. polska 34 no.8:1047-1051 Aug 59.

1. Z II Kliniki Pediatrycznej A. M. we Wroclawiu. Kierownik: prof. dr med. M. Wierzbowska.
(SODIUM SALICYLATE, ther.) (RHEUMATIC FEVER, ther.)
(17-KETOSTEROIDS, urine)

WIERZBOWSKA, Maria; PUZIEWICZOWA, Izabela

Protein disorders in lipoid nephrosis. Pol. tyg. lek. 17 no.10:349-353 5 Mr '62.

1. Z II Kliniki Pediatrycznej AM we Wroclawiu; kierownik: prof. dr Maria Wierzbowska.

(BLOOD PROTEINS) (NEPHROTIC SYNDROME blood)

ADRIANOV, P.K.; ANDRIANOV, S.M.; BEREZIKOV, B.S.; GOLOVKO, V.G. [Holovko, V.H.]; DOBROVOL'SKIY, A.V. [Dobrovol's'kyi, A.V.]; DOVGAL', M.F. [Dovhal', M.F.]; YELIZAROV, V.D. [Elizarov, V.D.]; ZHIZDRINSKIY, V.M. [Zhyzdryns'kyi, V.M.]; ZVENIGORODSKIY, O.M. [Zvenigorods'kyi, O.M.]; ZAYCHENKO, R.M. [Zaichenko, R.M.]; IVANENKO, Ye.I. [Ivanenko, Ie.I.]; KOMAR, A.M.; KOS'YANOV, O.M.; KAZAKOV, O.I.; KOSENKO, S.K.; KLIMENKO, T.A.; KIR'YAKOV, O.P.; KALISHUK, O.L.; LELICHENKO, M.T.; LEBEDICH, M.V.; MIKHAYLOV, V.O. [Mykhailov, V.O.]; MOROZ, I.I.; MOSHCHIL', V.Yu. [Moshchil', V.IU.]; NEPOROZHNIY, P.S. [Neporozhnii, P.S.]; NEZDATNIY, S.M. [Nezdatnyi, S.M.]; NOVIKOV, V.I.; POLEVOY, S.K. [Polevoi, S.K.]; PEREKHREST, M.S.; PUZIK, O.Ye. [Puzik, O.E.]; RADIN, K.S.; SLIVINSKIY, O.I. [Slivins'kyi, O.I.]; STANISLAVSKIY, A.I. [Stanislavs'kyi, A.I.]; USPENSKIY, V.P. [Uspens'kyi, V.P.]; KHORKHOT, O.Ya.; KHILYUK, F.P.; TSAPENKO, M.P.; SHVETS, V.I.; MAL'CHEVSKIY, V. [Mal'chevs'kyi, V.], red.; ZELENKOVA, Ye. [Zelenkova, E.], tekhn.red.

[The Ukraine builds] Ukraina buduie. Kyiv, Derzh.vyd-vo lit-ry z budivnytstva i arkhit., 1957. 221 p. (MIRA 11:5)
(Ukraine--Construction industry)

PUZHAKA, Kh. Ya.: Master Biol Sci (diss) -- "On the significance of the vegetative nervous system in regulating the processes of cell division". Riga, 1959. 18 pp (Min Health Latvian SSR, Riga Med Inst), 300 copies (KL, No 18, 1959, 123)

Abs Jour : Ref Zhur - Biol., No 8, 1958, 33302

Author : Puzhaka, Kh. Ya.
Inst :
Title : Nerve Regulation of Cell Division Processed. (O nervnykh regulyatsiyakh protsessov deleniya kletok).

Orig Pub : Zinatnisko rakstu krajums. Rigas med. inst., Sb. nauchn. rabot. Rizhsk. med. in-t, 1956, No 6, 75-83

Abstract : A study was conducted on mitotic activity (MA) on the epithelial cornea of mice and rats by hypodermic injection of substances which stimulate (ephedrine), excite (pilocarpine) and depress (atropine) the sympatheitc mediator of the cell cholinreactive systems. When rats are injected with 2.5 mg of ephedrine per kg weight, there is a decrease of MA in 15 minutes, which attains a minimum 2 hours after the injection; the MA then starts to increase and 6 hours after the injection

PUZHAY, A.

Plane germanium diodes. Radio no.1:27-28 Ja '55. (MLRA 8:3)
(Germanium diodes)

PUZHAY, A.

USSR/ Electroncis - Germanium diodes

Card 1/1 Pub. 89 - 13/27

Authors : Puzhay, A.

Title : Flat germanium diodes

Periodical : Radio 1, 27-28, Jan 1955

Abstract : New types of germanium diodes, called flat diodes, are described. Four types of such diodes are mentioned, they are: DG-Ts21, DG-Ts22, DG-Ts23 and DG-Ts24. These diodes are designed for a higher voltage than point-contact diodes. They permit a larger load and are very durable. Their life-hours is about 4000 working hours. Diagram. Graphs.

Institution : .....

Submitted : .....

PUZHAI, A.

USSR

2128

621.314.63 : 537.311.33

Planar [-junction] Germanium Diodes.—A. Puzhai.

[Radio, Moscow, Jan. 1955, No. 1, pp. 27-29] [illegible] temperatures of 20°, 50° and

70°C are given of four [illegible] of their construction [illegible] diodes. A section drawing also shown.

[illegible], A., [illegible], V.

Vacuum Tubes

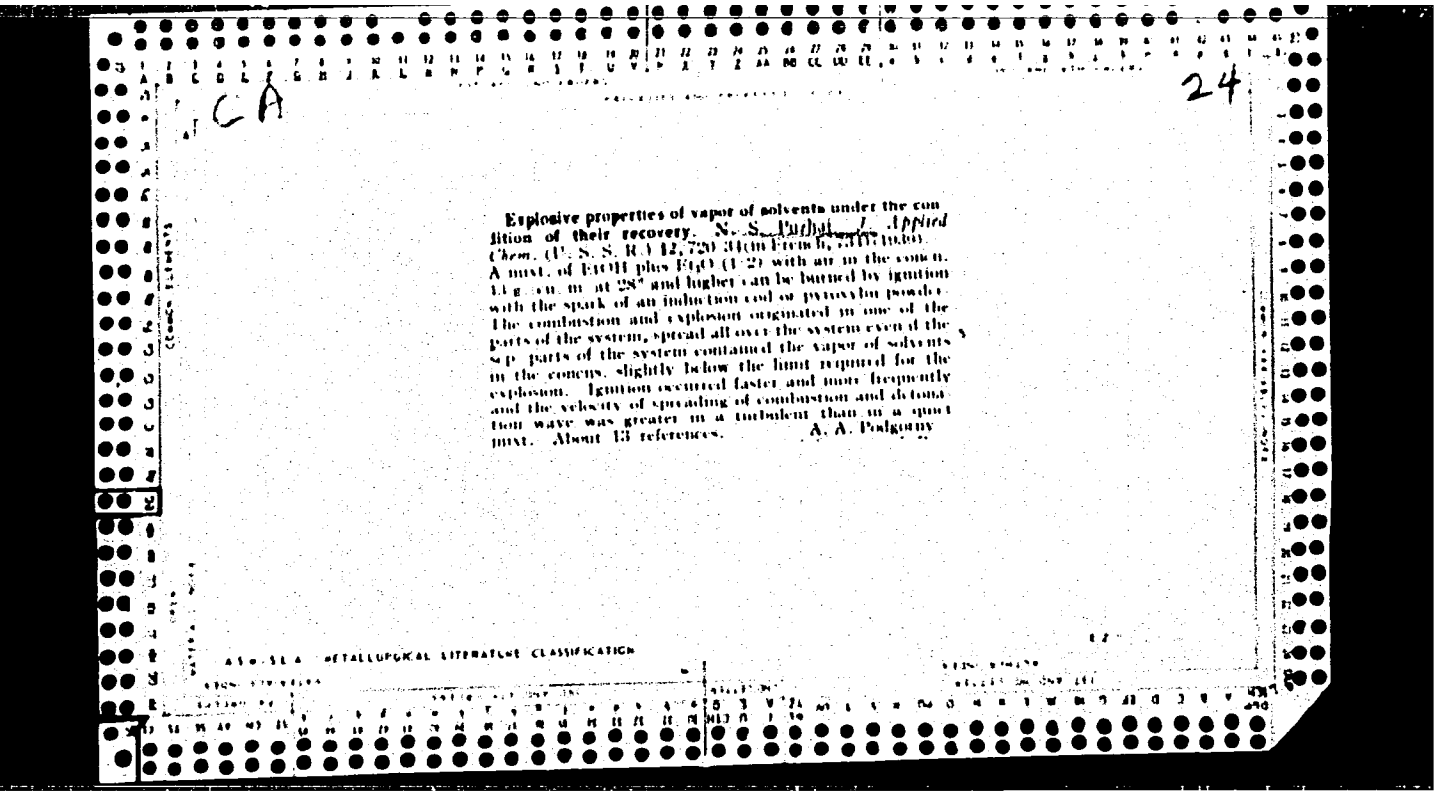
Germanium diodes. Radio No. 5, 1953.

Monthly List of Russian Accessions, Library of Congress
June 1953. UNCL.

PUZFIN, M.Ye., vrach

Pseudocroup in children. Zdorov'e 6 no.2:30 F '60. (MIRA 13:5)

(CROUP)

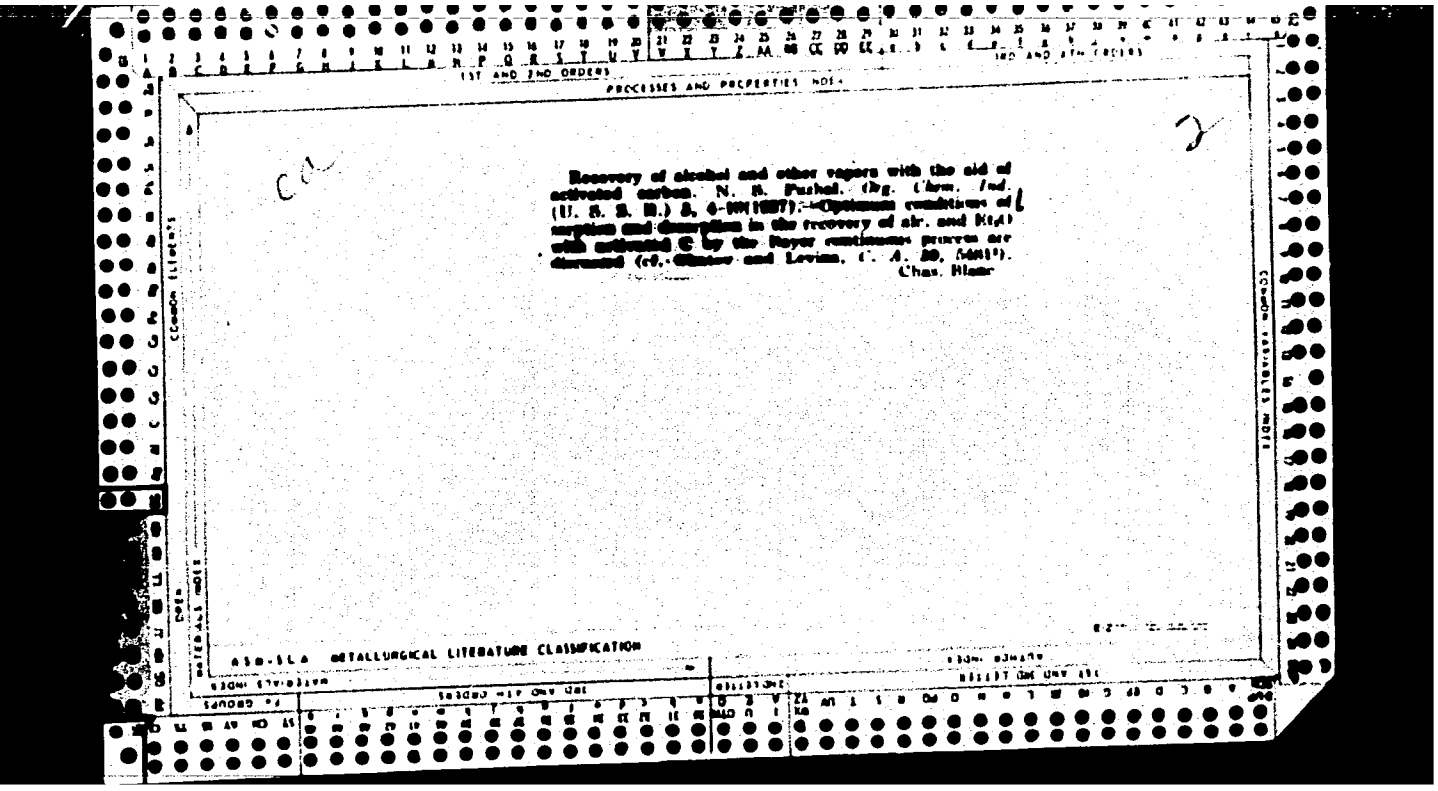


CA

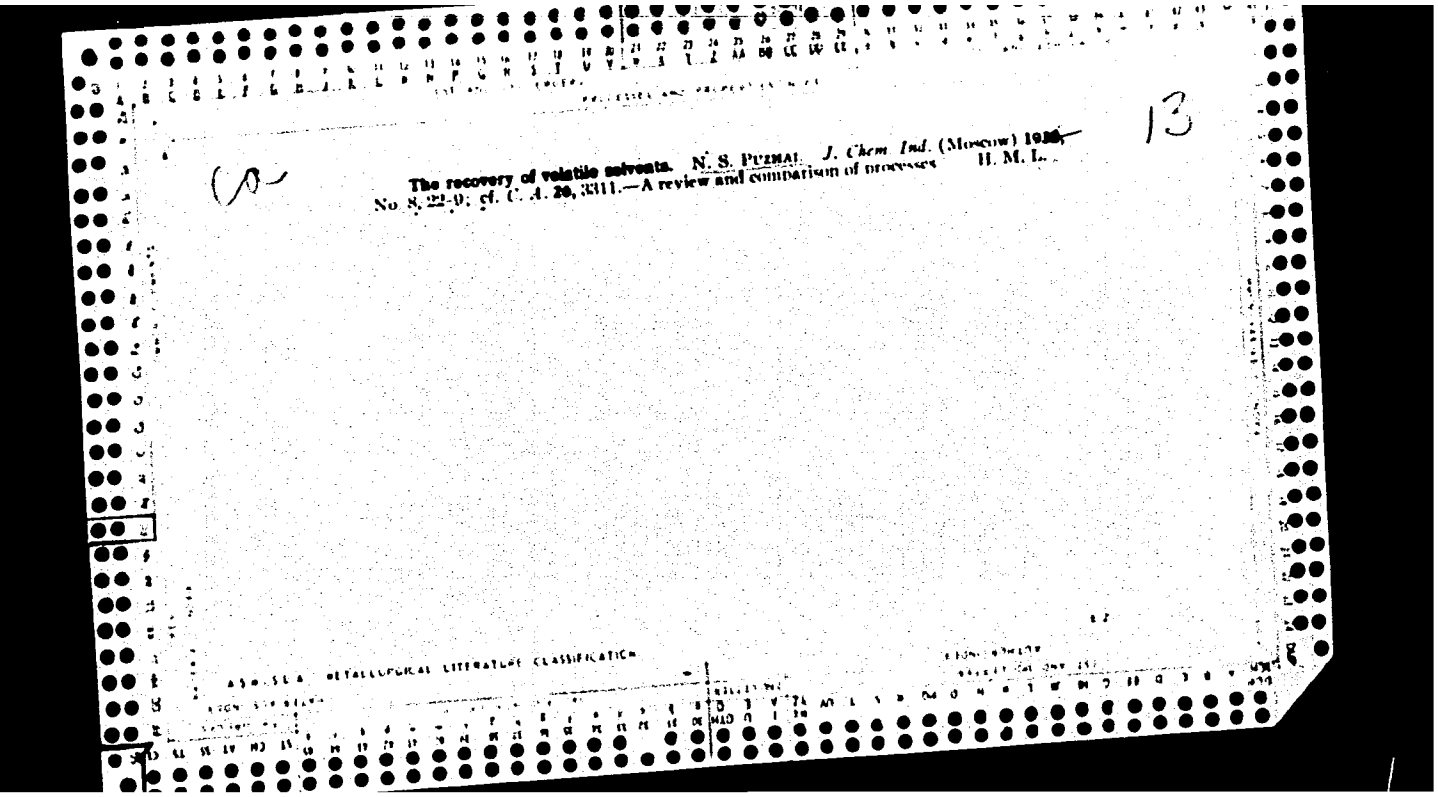
24

Explosive properties of vapor of solvents under the condition of their recovery. N. S. [illegible] *J. Applied Chem.* (U. S. S. R.) 12, 720-31(in French, 731-3)(1939). A mixt. of $EtOH$ plus Et_2O (1:2) with air in the concn. 1.1 g. per l. at 28° and higher can be burned by ignition with the spark of an induction coil or pyroxylin powder. The combustion and explosion originated in one of the parts of the system, spread all over the system even if the sep. parts of the system contained the vapor of solvents in the concns. slightly below the limit required for the explosion. Ignition occurred faster and more frequently and the velocity of spreading of combustion and detonation wave was greater in a turbulent than in a quiet mixt. About 13 references. A. A. Podgorny

A14-51A METALLURGICAL LITERATURE CLASSIFICATION



Recovery of alcohol and other vapors with the aid of activated carbon. N. B. Pechal. (Eng. Chem. Ind. (U. S. S. R.) 5, 6-9(1927).—Optimum conditions of sorption and desorption in the recovery of air- and [illegible] with activated C by the Meyer continuous process are discussed (cf. Chaney and Levine, C. A. 20, 3481). Chas. Blanc

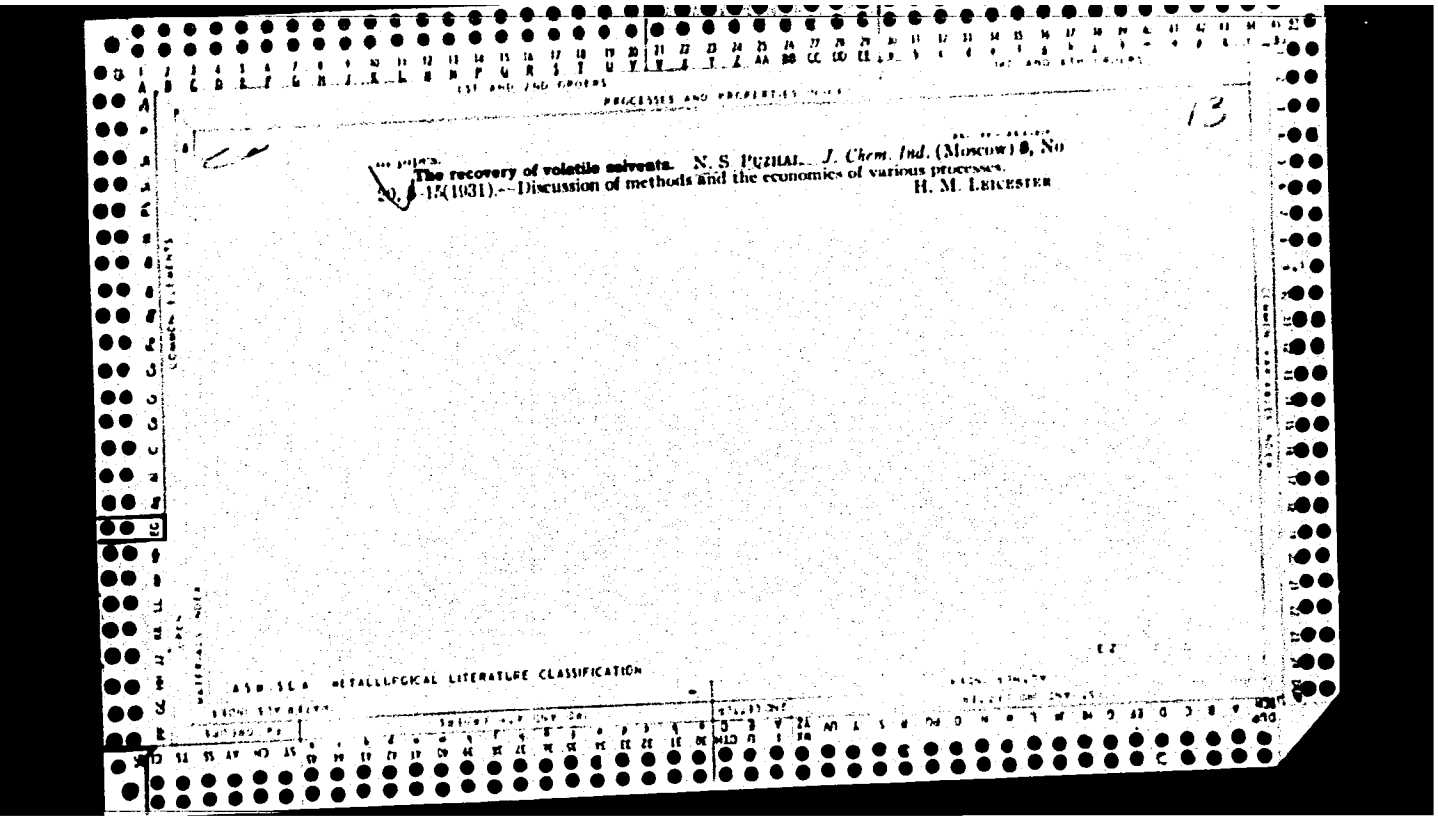


(8-

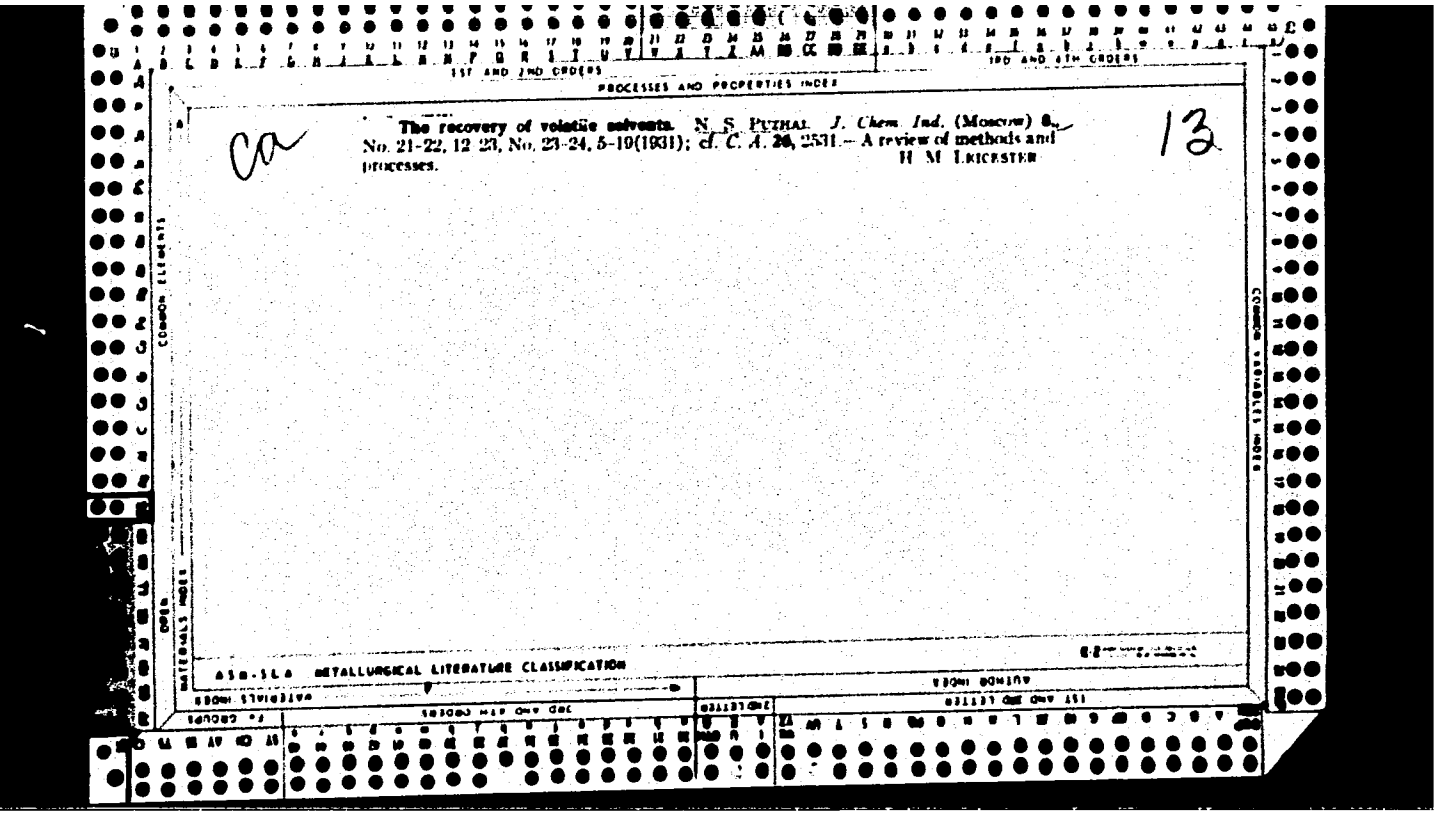
13

The recovery of volatile solvents. N. S. Puzhal. *J. Chem. Ind.* (Moscow) 1930, No. 8, 22-9; cf. C. A. 20, 3311.—A review and comparison of processes H. M. L.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



The recovery of volatile solvents. N. S. PUZHAL. *J. Chem. Ind.* (Moscow) **8**, No 10, 15(1931).—Discussion of methods and the economics of various processes.
H. M. LEICESTER



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

Ca

13

The recovery of volatile solvents. N. S. PUTRAL. *J. Chem. Ind.* (Moscow) 8, No. 21-22, 12-23, No. 23-24, 5-10(1931); cf. *C. A.* **26**, 2531.—A review of methods and processes. H. M. LEICESTER

COMMON ELEMENTS

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

AUTHOR INDEX

PUZHANOV, G.T.

Physicomechanical properties of building materials made of metallurgical waste products and liquid glass. Trudy Kazakh. fil. Asia no.2:125-133 '60. (MIRA 15:2)
(Kazakhstan--Building materials)

KONSTANTINOV, V.V., kand.tekhn.nauk; PUZHANOV, O.T., mladshiy nauchnyy sotrudnik

High-strength rapidly hardening slag-silicate concretes for precast reinforced concrete construction elements. Bet. i zhel.-bet. no.10:468-470 O '60. (MIRA 13:10)
(Concrete)

PUZHAY, A.

USSR/ Electronics - Diodes

Card 1/1 Pub. 89 - 18/24

Authors : Puzhay, A., and Gol'denberg, V.

Title : Typical resistance characteristics of germanium point diodes

Periodical : Radio 5, 45 - 46, May 1955

Abstract : Expert data are presented on the direct and counter resistance characteristics of germanium point diodes. Graphs are given showing the relation between the direct and counter resistance of diodes and the voltage fed to these diodes. The role of load resistance and temperature of the surrounding medium in the selection of diode types is explained. Graphs.

Institution : .....

Submitted : .....

PUZHAY, A.N. (Moskva)

Germanium diodes. Avtom.i telem. 17 no.2:140-146 F '56. (MIRA 9:7)
(Germanium diodes)

PUZHAY, Z.; GOL'DENBERG, V.

Standard resistance characteristics of germanium point diodes.
Radio no.5:45-46 My '55. (MLRA 8:6)
(Germanium diodes)