31600
S/048/61/025/012/004/022
B102/B138

24.2200

AUTHORS: Shtol'ts, Ye. V., Glazer, A. A., and Shur, Ya. S.

TITLE: Variation of the process of magnetic reversal when the dimensions of ferromagnetic particles are reduced

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1961, 1445 - 1448

TEXT: That the coercive force of ferromagnetic powders increases with decreasing grain size is already known, but the nature of this effect remains unknown. In this study magnetic reversal was studied on MnBi powder as it has high anisotropy, which permits visual observation of magnetic reversal even in single-domain particles. Since MnBi is magnetically uniaxial, pseudo-monocrystalline specimens could be produced with the following particle sizes (coercive forces): 100·20μ(200 oe) 70·20μ(600 oe), 16·3μ(2,900 oe) and 4·4μ(12,500 oe). For these four types photographs were made of powder deposits in various states of magnetization at fields of up to 21,700 oe. The relative residual magnetization was determined for all size groups: 0.21, 0.54, 0.73 and 0.96 was found. The magnetic reversal

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31603
S/048/61/025/012/008/022
B116/B138

24 2200 (1147, 1121)

AUTHORS: Startseva, I. Ye., and Shur, Ya. S.

TITLE: The nature of the rectangular hysteresis loop of magnesium-manganese ferrites

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v.25, no. 12, 1961, 1469 - 1472

TEXT: Under certain conditions, Mg-Mn ferrites have a spontaneously rectangular hysteresis loop the reason for which is still unknown. Such ferrites have highly distorted domain boundaries, due possibly to the inhomogeneity of the crystal structure. It is shown that this assumption is justified. Variations in domain structure of an Mg-Mn specimen which had a large rectangular factor P_R when changing its magnetic state during a hysteresis cycle (Ref. 3, see below) were studied by the powder method. The effect of demagnetization on the first magnetization curves was studied on toroidal ferrite specimens (MM-7(MM-7)) supplied by L. I. Rabkin. The magnetization curves were recorded by the ballistic method. The specimen was demagnetized before each measurement. Observations of the domain structure showed that

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Card 2/3

S/048/61/025/012/011/022
B117/B104

AUTHORS: Yermolenko, A. S., and Shur, Ya. S.

TITLE: The nature of the coercive force in alloys of the "Alnico" type

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1961, 1479 - 1483

TEXT: Alloys of the system Fe-Ni-Al differ from other age-hardening alloys used for permanent magnets so far as their maximum coercive force is not due to quenching the material from the temperature of the single-phase state and subsequent tempering (treatment of type I) but rather to cooling at a certain critical rate and tempering (treatment of type II). The difference between the two types of treatment was studied in the present paper, basing on studies of magnetic properties of monocrystals of an alloy containing 24% Co, 14% Ni, 8% Al, 3% Cu, 51% Fe. The disk-shaped specimens were 0.35 mm thick and 6 mm in diameter. Their surfaces coincided with the crystal plane (100) with an error of up to 2°. The heat treatment was made in an argon atmosphere. A rotary magnetometer was

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The nature of the coercive...

used to measure the magnetic characteristics. The coercive force was measured at room temperature by the usual ballistic method. The variation in coercive force and torque amplitudes was measured at 625°C in a field of 16 600 oe according to the tempering time. The coercive force of specimen no. 2 (treatment of type II) rapidly reaches its maximum value of 430 oe and remains practically constant beyond this value. After tempering specimen no. 1 (treatment of type I) for 60 hours, its coercive force reaches a value of 90 oe at 625°C which can, however, be increased by additional tempering at 700°C and subsequent annealing at 625°C. After a 54-hour tempering, both specimens exhibit identical torque amplitudes which even increase in no. 1 if the process is continued. In specimen no. 1, the torque amplitudes are negative in the entire field and slightly dependent on the field. In no. 2, the amplitudes are positive in fields of less than 8000 oe and negative in stronger fields. After a 60-hour tempering at 625°C the amplitudes are positive in the entire field. In the present case, the shape of the torque characteristics was related to the presence of two types of anisotropy in the specimen: (1) crystallographic magnetic anisotropy and (2) an anisotropy related to the form of

The nature of the coercive ...

precipitates (anisotropy of the stray fields). During the decay the last-mentioned type plays an ever more important role; the characteristics are shifted from the negative to the positive range. After a 60-hour tempering at 625°C the torque characteristics for both specimens have practically identical amplitudes over a wide range of fields, whereas the coercive forces differ from each other by a factor of nearly 5. Investigation of the saturation magnetization I_s and of the coercive force in the temperature range, where these characteristics change reversibly, has shown that both specimens agree as to I_s and temperature dependence. This indicates that independent of the type of treatment, the phases resulting from decay are of identical or similar composition. Great differences in the relative amounts of the phases are also unlikely. After tempering the specimens for 60 hours, rotational hysteresis as a function of the strength of the external field exhibited the same character as ordinary hysteresis in an alternating magnetic field. The large differences in the coercive force of the specimens, produced by the two types of treatment, are attributed to a definite distribution of grains

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The nature of the coercive...

according to their coercive force. The special advantage of the treatment of type II is that a structure with almost equal grain sizes can be obtained. The grain size corresponds to the coercive force. The authors thank L. V. Smirnov for the growing of monocrystals, and L. M. Magat for having determined their orientation. There are 5 figures and 9 references: 4 Soviet and 5 non-Soviet. The four most recent references to English-language publications read as follows: Wohlfarth, E. P., Philos. Mag., Suppl., 8, 87 (1959); Clegg, A. G., McCaig, M., Proc. Phys. Soc. London, B, 70, 817 (1957); Nesbitt E. A., Williams H. J., Bozorth R. M., J. Appl. Phys., 25, 1014 (1954); Fisher J. S., Hollomon J. H., Turnbull D., J. Appl. Phys., 19, 775, (1948).

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

S/126/62/013/001/002/018
E073/E535

AUTHORS: Luzhinskaya, M.G. and Shur, Ya.S.

TITLE: On the nature of magnetic anisotropy in Vicalloy

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.1, 1962, 49-53

TEXT: According to theoretical conceptions, the magnetic anisotropy of single domain formations may be due to natural crystallographic anisotropy of particles of the ferromagnetic phase, anisotropy of the shape of the particles, or anisotropy of the stresses in the material. No definite data on the nature of this anisotropy in Vicalloy have so far been published. In this paper the changes in the magnetic properties of Vicalloy sheet, measured in various directions relative to the direction of rolling, as a function of the tempering temperature were investigated. The alloy used contained 12% V, 50% Co, rest Fe. The sheet was cold rolled to 1 mm thickness with a relative reduction of 86%. Furthermore, an alloy containing 11% V and 52% Co, rest Fe was used in the form of 0.6, 0.4 and 0.2 mm sheets. The specimens were in the form of strips 100 mm long, 1.5-2.0 mm wide

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and discs of 6 mm diameter. For strips cut in the direction of rolling, transverse to that direction and at an angle of 45°, the magnetization curves and the hysteresis loops were measured; on discs the coercive force H_c was measured at various angles relative to the direction of rolling. Measurements were made by a ballistic method in fields up to 2700 Oe; this field is sufficient for obtaining maximum values of residual magnetization I_r. The saturation magnetization was determined by extrapolation for an infinitely large field. Fig.1 shows the dependence of the coercive force H_c, Oe, and the relative residual magnetization $j_r = I_r/I_s$ on the tempering temperature (of 30 min duration) for 1 mm thick strips. The dots relate to values measured in the direction of rolling and the crosses to the transverse direction. There is a change in scale after the initial section of the graph. It can be seen that j_r, which is low for specimens which have not been tempered, increases sharply in the case of relatively low tempering temperatures (400°C), which is in agreement with results obtained earlier on Vicalloy wire specimens. Fig.2 shows the magnetization curve and the hysteresis loops of

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E073/E535

18.1142

AUTHORS: Magat, L.M., Luzhinskaya, M.G. and Shur, Ya.S.

TITLE: Change in the magnetic and crystalline structure of Vicalloy during tempering

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.2, 1962, 192-198

TEXT: To elucidate the nature of the high coercive force of Vicalloy, further structure investigations combined with measurement of the basic magnetic characteristics are necessary. The authors carried out X-ray diffraction studies of the fine structure of the alloy, determining the dimensions of the mosaic blocks and the size of micro-deformations corresponding to type II stresses. In addition, the coercive force, the saturation magnetization and the residual magnetization were measured, as well as the hardness of the specimens. In the experiments an alloy containing 12% V, 52% Co, rest Fe was used. The specimens were first drawn with a large reduction so that, after a suitable heat treatment, optimum magnetic properties were obtained. The measurements were made on specimens that had been tempered within

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results with those of studies of the magnetic properties, the mechanism of formation of a high coercive force in Vicalloy is explained as follows. In the untempered state, the alloy has a multi-domain magnetic structure. During low temperature tempering, the γ-phase forms along the boundaries of the α-phase blocks in the form of thin interstices which constitute a barrier against displacement of the boundaries between the domains. Therefore, even for small quantities of the γ-phase, the magnetic structure will approach the single domain structure. If the tempering temperature and the quantity of γ-phase are increased, the magnetic structure becomes a single domain one due to a further splitting of the α-phase blocks by the γ-phase and to a reduction of the dimensions of the α-phase blocks. After high temperature tempering, the dispersion of the phases decreases and the conditions for the existence of a single domain magnetic structure cease to exist. Thus, the increase in H_c is due to the development of a single domain structure. Of considerable importance also is the magneto-crystalline anisotropy of the α-phase, which is small after low temperature

tempering and reaches maximum values at tempering temperatures that are higher than those which are suitable for obtaining a single domain magnetic structure. Maximum H_c values are obtained if in addition to the existence of a single domain structure, the material has a sufficiently large natural crystalline magnetic anisotropy. There are 2 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AS USSR)

SUBMITTED: May 5, 1961

24,22-00

S/126/62/013/003/005/023
E039/E135

AUTHORS: Shtol'ts, Ye.V., and Shur, Ya.S.

TITLE: On the process of magnetic reversal in single crystal particles of the alloy MnBi

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962, 359-364

TEXT: It is well known that as the size of particles of ferromagnetic substance is decreased the coercive force increases. Hence, in fine powders in which the particles have a large magnetic anisotropy, very high values of coercive force can be obtained. The physical nature of this effect has not been sufficiently studied. Previous work was hampered because of the difficulty in preparing samples of pseudo-crystals in which the single crystal particles are orientated in space. In this work the difficulty was overcome by using the ferromagnetic alloy MnBi prepared by sintering powdered Mn and Bi in a magnetic field. The particle size was changed by sintering at different temperatures. It is shown that the formation of the magnetic

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phase begins at about 250 °C, maximum magnetic saturation being reached at 300 °C. Curves are obtained for magnetisation along and at right angles to the magnetic axis. In the former case saturation is reached in a field of about 5000 oersted, while in the latter it only reaches 50% saturation at 20 000 oersted. By decreasing the size of the particles from 100 x 19 to 16 x 3 microns the coercive force along the axis increased from 200 to 2900 oersted and values of relative residual magnetisation increased from 0.21 to 0.71. The dependence of the coercive force on the angle φ between the texture axis and the direction of the magnetising field was investigated. It is shown that for samples with dimensions 100 x 19 to 70 x 19 microns the maximum coercive force occurs for an angle $\varphi = 90°$, whereas for particle sizes of 19 x 4 and 16 x 3 microns the maximum coercive force occurs at $\varphi = 45$ to $60°$. On comparing these results with theory for samples 100 x 19 microns the agreement is good up to $\varphi = 60$ to $70°$; for larger values of φ the experimental curve falls below the theoretical one. For particles of

On the process of magnetic reversal.. S/126/62/013/003/005/023
E039/E135

16 x 3 microns the agreement is good only up to φ = 30 to 40°, after which the experimental curve decreases. It is concluded that for large values of φ the magnetisation process occurs as a result of an irreversible rotation of the magnetisation vector in the particles.
There are 7 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, AS USSR)

SUBMITTED: July 25, 1961

Card 3/3

The mechanism of thermomagnetic ...

precipitate and by growth of some particles at the expense of others. There are 8 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: June 11, 1962

Card 3/3

S/126/62/014/003/016/022
E073/E420

AUTHORS: Shur, Ya.S., Magat, L.M., Yermolenko, A.S.

TITLE: On the relation between the crystal structure and the magnetic properties of alnico

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.3, 1962, 458-461

TEXT: So far, the nature of the structural transformations which lead to a reversible change in the magnetic properties of alnico has not been resolved and the authors considered it of interest to try to observe these transformations by accurate measurement of the lattice parameters and a determination of the average distance between defects from the positions of the satellites on the X-ray spectra. Specimens in the form of discs and plates cut from single crystals in the plane (100) of the alloy (24% Co, 14% Ni, 8% Al, 3% Cu, remainder Fe) were used in studying the temperature dependence of the coercive force and the saturation magnetization by means of a rotary magnetometer. It was found that these properties do not depend on the preceding heat treatment but are determined solely by the last tempering temperature, which

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S/126/62/014/004/006/017
E039/E435

24,2200

AUTHORS: Shur, Ya.S., Glazer, A.A., Shtol'ts, Ye.V.

TITLE: On the nature of the temperature instability of the residual induction in powdered MnBi alloy permanent magnets

PERIODICAL: Fizika metallov i metallovedeniy, v.14, no.4, 1962, 523-528

TEXT: The temperature dependence of the domain structure of small particles of MnBi alloy with residual magnetization is studied by means of the Kerr effect over the range ± 200°C. Three particle sizes are investigated (samples 1, 2 and 3 of 6, 20 and 30 μ respectively), the coarse particles having a multidomain structure while the finer particles are single domain at room temperature. Critical temperatures are found for the transition from single to multidomain structure, which are lower for the smaller particles. The temperature dependence of the relative residual magnetization I_r/I_s (I_r is the residual magnetization and I_s the saturated magnetization) is also determined. At 20°C the values of I_r/I_s for samples 1,2 and 3

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SHUR, Ya. S.; GLAZER, A. A.

Temperature dependence of domain structure in magnetouniaxial ferromagnetic materials. Fiz. met. i metalloved. 14 no.4: 632-633 O '62. (MIRA 15:10)

1. Institut fiziki metallov AN SSSR.

(Domain structure)

ZAYKOVA, V.A.; SHUR, Ya.S.

Connection between magnetostriction curves with the domain structure of silicon iron crystals. Fiz.met.i metalloved. 14 no.5:785-787 N '62. (MIRA 15:12)

1. Institut fiziki metallov AN SSSR.
(Magnetostriction) (Domain structure)

SHUR, Ya.S.

Domain structure of ferromagnetic materials. Izv. AN SSSR. Ser. fiz. 26 no.2:261-262 F '62. (MIRA 15:2)
(Ferromagnetism)

S/048/62/026/002/017/032
B106/B104

AUTHORS: Startseva, I. Ye., Glazer, A. A., and Shur, Ya. S.

TITLE: Temperature dependence of domain structure in ferrosilicon crystals

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 262-265

TEXT: Earlier studies of the domain structure in ferrosilicon crystals (Ya. S. Shur, I. Ye. Startseva, Zh. eksperim. i teor. fiz., 39, 566 (1960)) have revealed a temperature hysteresis of domain structure. This fact may possibly be the cause of the departure of the calculated from the measured temperature dependence of domain structure. It was investigated as to whether experimental and theoretical data will agree better when this hysteresis is excluded. This may be accomplished by allowing the specimen to attain the state of equilibrium at every temperature. The domain structure of ferrosilicon with 3.5 % Si was examined by the magneto-optical Kerr effect. Annular specimens (outer diameter 40 mm, inner diameter 28 mm, 0.35 mm thick) were cut out from coarsely crystalline

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Temperature dependence of...

textured ferrosilicon. After polishing the specimens were vacuum tempered at 1200°C, and subsequently their surface was slightly oxidized in order to increase the angle of rotation of the plane of polarization. The (011) face was near the surface in most of the crystallites. Temperature dependence of the domain structure was studied in the range of 20-600°C. At every temperature the specimens were carefully demagnetized by alternating magnetic field with its amplitude monotonically decreasing to zero. This procedure was to eliminate the temperature hysteresis of domain structure. The studies led to the following conclusions: (1) The domain width is strongly temperature dependent when temperature hysteresis is eliminated by demagnetization at every temperature. (2) The temperature dependence of the domain width observed in equilibrium agrees qualitatively with the calculated data. Strictly quantitative comparison of experimental and theoretical data was not possible as it is not known how the magnetic flux is closed at the crystal edges. (3) Various authors found in the study of different ferromagnetics great discrepancies between the experimental and theoretical temperature dependences of the domain widths These discrepancies are obviously due to the fact that the observed domain structures which exist in metastable states were compared with the

Temperature dependence of .

calculated equilibrium structures. There are 3 figures and 9 references: 5 Soviet and 4 non-Soviet. The three most recent references to English-language publications read as follows: Andrä W., Ann. phys., 7, 78 (1956); Fowler C., Fryer E., Phys. Rev., 94, 52 (1954); Tatsumoto E. Okamoto T., J. Phys. Soc. Japan, 14, 1588 (1959).

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Card 3/3

S/048/62/026/002/018/032
B106/B104

AUTHORS: Glazer, A. A., Shtol'ts, Ye. V., and Shur, Ya. S.

TITLE: Temperature dependence of transition domain structure in small-size particles of MnBi alloy

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 266-269

TEXT: The present work was experimentally to check on earlier conceptions (Ref. 1: Ya. S. Shur, Ye. V. Shtol'ts, G. S. Kandaurova, L. V. Bulatova, Fiz. metallov i metallovedeniye, 5, 234 (1957); Ye. V. Shtol'ts, A. A. Glazer, Ya. S. Shur, Izv. AN SSSR. Ser. fiz., 25, no. 12, 1445 (1961)) about the nature of magnetic transition domain structure which may occur at certain dimensions of small-size particles of MnBi alloy. The temperature dependence of domain structure of MnBi alloy particles with transition structure at room temperature was studied. At room temperature the alloy MnBi has a very high coefficient K of anisotropy (some 10^7 erg/cm^3) which is highly temperature dependent whereas the saturation magnetization I_s of the alloy is only slightly dependent on temperature. K drops to one

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Temperature dependence of transition...

tenth its value as temperature decreases from +20 to -150°C, while I_s increases by 5 %. The boundary energy associated with the value of K can therefore be varied within a wide range by varying temperature whereas the magnetic charges remain practically unchanged. The domain structure of specimens described earlier (Ref. 1) has been studied by the polar magneto-optical Kerr effect. Remagnetization at room temperature after magnetization of the particle by a strong field (some 10^3 oe) was visually observed. The magnitude of the negative magnetic field at which sudden remagnetization occurs was determined (this field is practically equal to the coercive force). By the same magnetic field the particle was then brought to residual magnetization and cooled with liquid nitrogen. The changes in domain structure during the cooling were observed. Two different particles showed at -15 and -42°C, respectively, a sudden division into domains which turned out to be irreversible through subsequent temperature increase. The amount of this new domain phase was about equal to the quantity of original domain phase in the demagnetized state at room temperature. Remagnetization at room temperature of the particle with the lower splitting temperature has been effected only by a stronger magnetic field than in those cases with the other particles. In similar experiments it

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Temperature dependence of transition...

was established that the temperature of splitting into domains decreases with increasing coercive force of the particle with transition structure. Some particles heated to +200°C did not split into domains. The results are interpreted as follows: In the case of magnetization at room temperature by a field that is strong enough to suppress nuclei of remagnetization the particle remains in the state of residual magnetization. Owing to the decrease of the coefficient of anisotropy, boundary energy decreases on cooling and new remagnetization nuclei will form leading to transition into domain structure at a certain temperature. This process is jump-like because it leads from a metastable to a stable state. The formation of remagnetization nuclei is inhibited with increasing coercive force. One therefore has to cool lower to achieve transition into domain structure. K does not decrease on heating to 200°C and consequently does not reduce the boundary energy. From these results the authors infer that inhibition of remagnetization nucleus formation is the reason for the occurrence of a transition structure. Such an inhibition may occur at high boundary energy densities. A. S. Yermolenko is mentioned. There are 2 figures and 5 references: 2 Soviet and 3 non-Soviet. The reference to the English-language publication reads as follows: Roberts B [illegible], Bean C. P., Phys. Rev., 96, 1494 (1954).

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SSD Pad/Pt-4 JD/HW S/0126/63/015/006/0839/0845
ACCESSION NR: AP3002842

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AUTHORS: Kandaurova, G. S.; Shur, Ya. S.

TITLE: Domain structure of a cobalt monocrystal

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 6, 1963, 839-845

TOPIC TAGS: domain structure, cobalt monocrystal, powder figure , effect of magnetic field

ABSTRACT: The domain structure variation on the basal plane of a cobalt monocrystal has been observed. This structure consists of a maze representing the outlets of the basic spontaneous magnetization domains on the basal plane of the crystal. The sample was placed into a magnetic field with intensity of about 20 000 e; it was oriented parallel to the plane (the horizontal field) and also perpendicular to the plane (vertical field). The maze pattern was obtained after the crystal cooled below the Curie point and after the sample was demagnetized by a field parallel to its hexagonal axis. It was established that powder figures consisting of star patterns are formed under the action of a magnetic field perpendicular to the axis of light magnetization. The rows of stars were oriented in the direction perpendicular to the external magnetic field. This structure was preserved also in the remnant

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magnetization state of the sample. It is believed that in the latter case the internal crystalline structure approximates the simplest domain structure of plane parallel layers. Orig. art. has: 3 figures.

ASSOCIATION: Ural'skiy gosudarstvenny*y universitet im. A. M. Gor'kogo (Ural State University); Institut fiziki metallov AN SSSR (Institute of Physical Metallurgy, Academy of Sciences, SSSR)

SUBMITTED: 28Jul62 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: ML NO REF SOV: 003 OTHER: 006

Card 2/2

SHUR, Ya.S.; KANDAUROVA, G.S.

Observation of the initial stages of the formation of remagnetization nuclei in a magnetoplumbite crystal. Fiz. met. i metalloved. 16 no.1: 158-160 Jl '63. (MIRA 16:9)

1. Institut fiziki metallov AN SSSR i Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Magnetoplumbite) (Magnetization)

ZAYKOVA, V.A.; SHUR, Ya.S.

Dependence of the curves of magnetostriction in silicon iron on the state of the crystal structure. Fiz. met. i metalloved. 16 no.4:614-617 O '63. (MIRA 16:12)

1. Institut fiziki metallov AN SSSR.

ACCESSION NR: AP4013090 S/0126/64/017/001/0031/0039

AUTHORS: Yermolenko, A. S.; Shur, Ya. S.

TITLE: Magnetic structural analysis of high coercivity Alnico alloy

SOURCE: Fizika metallov i metalloved., v. 17, no. 1, 1964, 31-39

TOPIC TAGS: Alnico alloy, magnetic structure, coercivity, saturation magnetization, crystallographic anisotropy, uniaxial anisotropy, tempering, annealing, quenching, rotary magnetometer

ABSTRACT: The temperature dependence of saturation magnetization, coercive force, and constants of crystallographic and induced anisotropy of Alnico alloy was investigated. The specimen was obtained by melting the alloy (24% Co, 14% Ni, 8% Al, 3% Cu, and the rest Fe) in a high-frequency furnace in vacuum. The saturation magnetization was investigated by Sucksmith's method (W. Sucksmith. Proc. Roy. Soc. 1939, A170,551). The specimens were prepared in the form of parallelepipeds of dimensions 5 x 0.7 x 0.7 mm. The thermal treatment of the specimen was performed in an atmosphere of argon or under vacuum in a specially designed apparatus which enabled the quenching of the specimen in water, then chilling it at a desired rate. The relative error in the measurement of the saturation magnetization did not

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exceed 1%. The temperature dependence of the constants of anisotropy and the coercive force was studied with the aid of a rotary magnetometer. For this experiment the specimen was prepared in the form of a disk 6 mm in diameter and 0.5 mm thick. The constant of anisotropy was obtained by a harmonic analysis of the torque curves. Ballistic methods were used for measuring small values of the coercive force and for studying its angular dependence. The effect of heating the specimen up to 600C and then cooling it was to increase the constant of anisotropy at room temperature. It was found that at high coercive states (final tempering at 560C) the alloy showed two phases sharply distinguished by their saturation magnetization, I_{s1} - about 1600 gauss and I_{s2} - about 100 gauss. The constant of uniaxial anisotropy could be computed from the formula $K_u = \frac{1}{2}(I_{s1} - I_{s2})^2 (N_b - N_a) \nu_1 \nu_2$, where N_a and N_b are magnetization factors and ν_1, ν_2 are relative phase volumes. The values computed from this and the experimental values agree. The nature of structural change and the mechanism of formation of highly coercive states are discussed. Orig. art. has: 7 figures and 3 formulas.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

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ACCESSION NR: AP4013090

SUBMITTED: 21May63 ENCL: 00

SUB CODE: MM, SS NO REF SOV: 003 OTHER: 018

Card 3/3

ACCESSION NR: AP4017367 S/0126/64/017/002/0296/0298

AUTHORS: Magat, L. M.; Shur, Ya. S.; Melkisheva, E. N.

TITLE: The relation of the coercive force to the initial decomposition stages in an oversaturated solid solution in the alnico alloys

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 296-298

TOPIC TAGS: alnico alloy, alni alloy, niobium-alnico alloy, alloying, oversaturated solid solution, solution decomposition, coercive force, modulation period, Guignet-Preston zone, tempering

ABSTRACT: The following alloys were studied by the method of x-ray analysis: alni (30% Ni, 14% Al); alnico (14% Ni, 8% Al, 24% Co, 3% Cu); Nb-alnico (14% Ni, 8% Al, 24% Co, 3% Cu, 0.9% Nb). The size of the spherical Guignet-Preston zones was determined from the scattering of x-rays in the Laue diffraction pattern, and the modulation period was determined from the position of satellites on the x-ray patterns of rotation. The coercive force was measured ballistically. Figure 1. on the Enclosure shows the results obtained. It was ascertained that the decomposition of a solid solution during tempering started with the formation of the Guignet-Preston zones which were replaced subsequently by a periodical modulation structure.

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ACCESSION NR: AP4017367

The growth of the coercive force during tempering started during the formation of the Guignet-Preston zones and reached its maximum during the second stage at a certain optimal magnitude of the modulation period. The above conclusions were true for all the types of the alloy studied. It was also proved that the satellites observed on the x-ray patterns of rotation correspond to a periodical modulated structure. Orig. art. has: 2 tables and 3 figures.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 10Jul63 DATE ACQ: 18Mar64 ENCL: 01

SUB CODE: ML NO REF SOV: 004 OTHER: 004

Card 2/3

ZAYKOVA, V.A.; GHUR, Ya.S.

Dependence of the form of magnetostriction curves of silicon iron crystals on the nature of changes in the domain structure during magnetic polarity reversal. Fiz. met. i metalloved. 18 no.3:348-359 S '64. (MIRA 17:11)

1. Institut fiziki metallov AN SSSR.

L 43857-65 EWT(1)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c) Pad/Pi-4
IJP(c) JD/HW/GG

ACCESSION NR: AP4048768 S/0126/64/018/004/0530/0534

27
26
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AUTHOR: Kandaurova, G. S.; Shur, Ya. S.; Gusel'nikova, N. I.

TITLE: Some characteristics of the domain structure of cobalt crystals

21

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 4, 1964, 530-534

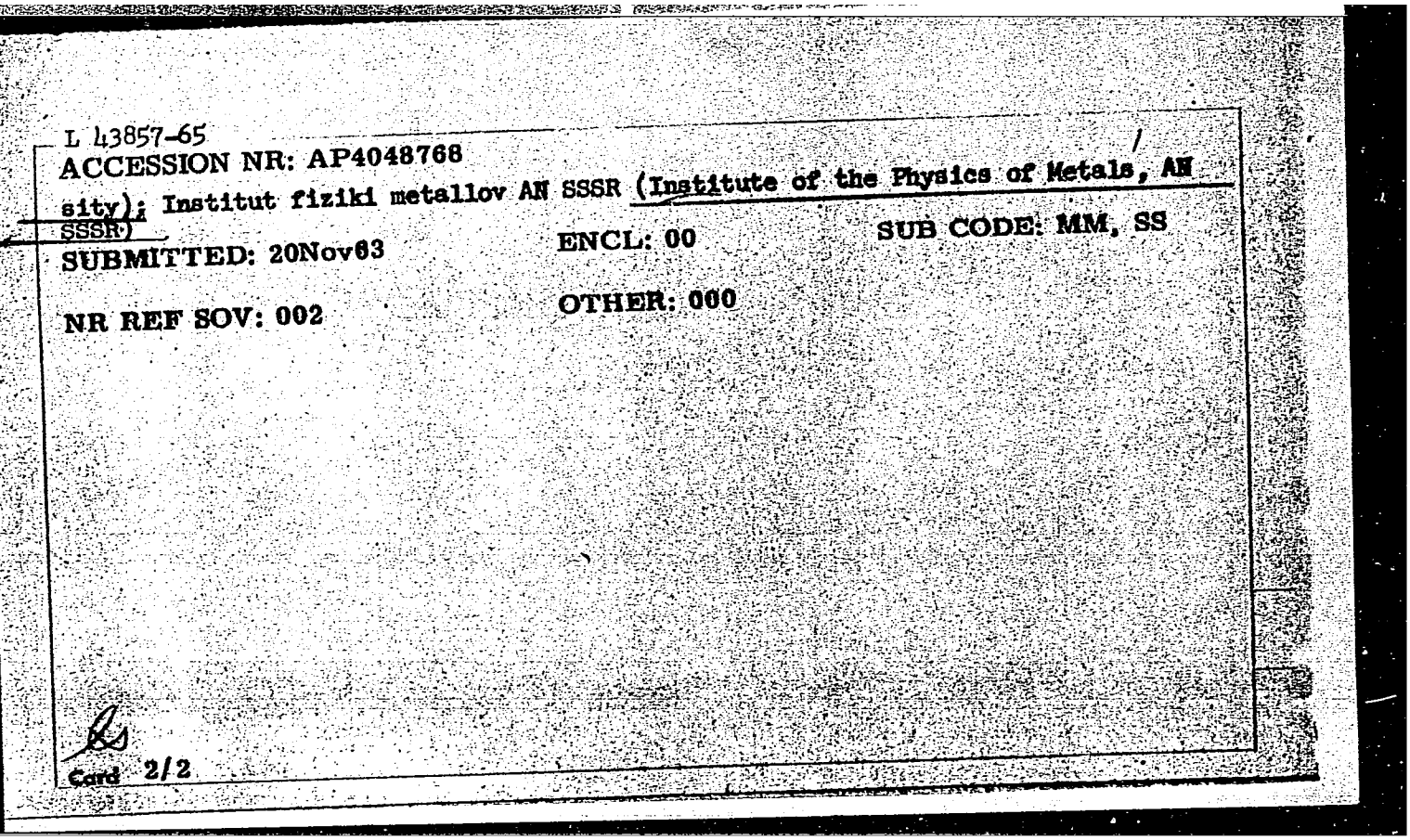
TOPIC TAGS: domain structure, cobalt single crystal, powder pattern, lamellar domain structure

27 19

ABSTRACT: The domain structure of magnetized crystals is usually deduced from the structure of the surface. In order to be able to judge about the domain structure of the bulk of the crystal, the authors in continuation of the previous work (FMM, 16, 2, 310 (1963)), have studied the powder patterns formed on different faces of the same single crystal of cobalt. After magnetization of the crystal in a field normal to the hexagonal axis, a simple lamellar domain structure is formed. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Ural'skiy gosuniversitet im. A. M. Gor'kogo (Urals State Univer-

Card 1/2



L 43857-65
ACCESSION NR: AP4048768
sity); Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)
SUBMITTED: 20Nov63 ENCL: 00 SUB CODE: MM, SS
NR REF SOV: 002 OTHER: 000

Card 2/2

L 43855-65 EWT(1)/EPA(s)-2/EWT(m)/EWA(d)/T/EWP(t)/EPA(bb)-2/EWP(z)/
EWP(b)/EWA(c) Pt-7 IJP(c) JD

ACCESSION NR: AP4048770 S/0126/64/018/004/0540/0552

AUTHOR: Yermolenko, A. S.; Melkisheva, E. N.; Shur, Ya. S.

TITLE: Dependence of the effect of thermomagnetic treatment on the orientation of the magnetic field in single crystals of an alnico type alloy

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 4, 1964, 540-552

TOPIC TAGS: thermomagnetic treatment, alnico alloy, magnetostatic energy, precipitation size

ABSTRACT: The authors studied the mechanical angular momentum in a magnetic field of single crystal discs made of alnico type alloys with surfaces in the crystallographic planes (001) and (110) after quenching and at various stages of annealing. The magnetic field was oriented in various crystallographic directions. The effect of the magnetic field was investigated with an electron microscope. It is concluded that the shape and orientation of precipitations are determined by the magnetostatic energy and by the surface and elastic energy. The ratio of the magnetostatic to the nonmagnetic energy depends on the size of the precipitations,

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L 43855-65

ACCESSION NR: AP4048770

2

the mutual orientation of the magnetization vector, the long axis of the precipitations, and the crystallographic axes. The authors are grateful to L. M. Magat for the determination of the orientation of the single crystals. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of the Physics of Metals AN SSSR)

SUBMITTED: 03Feb64 ENCL: 00 SUB CODE: MM, SS

NR REF SOV: 003 OTHER: 012

Card 2/2

L 22897-65 EED-2/EWT(1)/EWT(m)/EWP(b)/EWP(t) IJP(c) JD
ACCESSION NR: AP5001240 S/0126/64/018/005/0711/0716

AUTHOR: Bogoslovskiy, V.N.; Shchepetkin, A.A.; Startseva, I.Ye.; Antonov, V.K.; Chufarov, G.I.; Shur, Ya. S.

TITLE: Effect of the phase composition on the magnetic properties of magnesium-manganese-iron ferrite with a rectangular hysteresis loop

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 5, 1964, 711-716

TOPIC TAGS: ferrite magnetic property, magnesium ferrite, manganese ferrite, spinel solid solution, hysteresis loop

ABSTRACT: The object of this work was to find out whether the rectangularity of the hysteresis loop of Mg-Mn ferrites is related only to the presence of vacancies, or whether trivalent manganese ions also play a major part in this phenomenon. An Mg-Mn-Fe ferrite obtained from a mixture of 34 mol. % MgO, 8.5% MnO (in the form of $MnCO_3$) and 57.5% Fe_2O_3 and having a relatively high rectangularity coefficient of the hysteresis loop was investigated. X-ray diffraction was used to determine the concentration of the components of the spinel solid solutions, the magnetic characteristics were measured by the ballistic method, and changes in the composition of the solid solutions

Card 1/2

were induced by annealing the samples under various conditions. It was found that the increase or decrease in the rectangularity coefficient of the hysteresis loop is due primarily to the formation and disappearance of Mn^{3+} ions, although there is a simultaneous change in the concentration of vacancies in the spinel solid solution. Samples containing an appreciable quantity of vacancies but no Mn^{3+} ions have a rectangularity coefficient of less than 0.5. The authors conclude that the rectangular shape of the hysteresis loop of Mg-Mn-Fe ferrites obtained from a mixture containing over 50 mol. % Fe_2O_3 is due to the presence of Mn^{3+} ions which cause local distortions of the crystal structure of the spinel solid solution. Orig. art. has: 1 table, 1 figure, and 7 formulas.

ASSOCIATION: Institut metallurgii, Sverdlovsk (Metallurgical Institute); Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)

SUBMITTED: 02Nov63 ENCL: 00 SUB CODE: MM, EM

NO REF SOV: 007 OTHER: 010

S/0048/64/028/003/0504/0506

ACCESSION NR: AP4023397

AUTHOR: Onopriyenko, L.G.; Shiryayeva, O.I.; Shur, Ya.S.

TITLE: Ferromagnetic resonance in magnetically uniaxial single crystals and domain structure /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, 504-506

TOPIC TAGS: ferromagnetic resonance, domain structure, domain wall oscillation, domain wall resonance

ABSTRACT: It has previously been shown that a ferromagnetic substance with domain structure has three coupled resonant frequencies, due to precession of the magnetization within the domains and to oscillation of the domain walls (K.B.Vlasov and L.G.Onopriyenko, Fizika metallov i metallovedeniye,15,45,1963). These frequencies were calculated for an ellipsoidal sample having plane-parallel or cylindrical domain structure by the method employed by J.Smit and H.G.Beljers (Phillips Res.Rep. 10,113,1955), and the results of the calculations are presented briefly. Ferromagnetic resonances were observed at 36 895 megacycles in single crystal discs of mag-

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ACCESSION NR: AP4023397

netic plumbite and cobalt for various directions of the applied static field. The plumbite discs were 0.56 mm in diameter, 0.10 mm thick, and were cut with the axis of easy magnetization perpendicular to the plane of the disc. Two resonances were observed at fields for which a domain structure exists, and a third peak was observed at a strong field, corresponding to a state without domain structure. As the angle between the applied field and the axis of easy magnetization was decreased, this third peak shifted to lower fields and disappeared, together with one of the domain structure peaks, at an angle of 63°. The remaining peak disappeared at 36°. This behavior is in rough agreement with the theory. The cobalt discs were 7 mm in diameter, 0.2 mm thick, and were cut with the axis of easy magnetization in the plane of the disc. With the applied field in the plane of the disc perpendicular to the axis of easy magnetization, and the high frequency field perpendicular to the disc, two peaks were observed, of which one is related to the domain structure. As an angle between the applied field and the preferred axis was decreased, the peaks decreased in intensity, and disappeared at an angle of 78°. The cobalt discs were examined at various temperatures. Two resonance peaks were observed at temperatures up to 250°C. The resonance field decreased with increasing temperature. This behavior was expected. Orig.art.has: 5 formulas.

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ACCESSION NR: AP4023406 S/0048/64/028/003/0553/0558

AUTHOR: Shur,Ya.S.; Glazer,A.A.; Dragoshanskiy,Yu.N.; Zaykova,V.A.; Kandaurova,G.S.

TITLE: Regarding departures from homogeneity of magnetization within ferromagnetic domains /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, 553-558

TOPIC TAGS: ferromagnetic domains, ferromagnetic domain inhomogeneity, magnetization reversal nuclei

ABSTRACT: This paper is a short summary of investigations, conducted in the Ferromagnetic Laboratory of the Institute of Metal Physics of the Academy of Sciences, SSSR, concerning departures from homogeneity of magnetization within ferromagnetic domains. The early stages of the formation of magnetization reversal nuclei on the basal plane surface of a magnetoplumbite crystal, and their development into domains was observed by means of powder patterns. Motion pictures of this process were made, and several frames are reproduced. As the magnetizing field (perpendicular to the crystal surface) was gradually reduced from saturating values, the powder pattern,

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initially featureless, first showed large (~0.1 mm) circular bright spots. These decreased in size, increased in number, became irregular in shape, and finally some of them could be seen to grow into twisting domains of opposite magnetization. The initial large spots revealed by the powder pattern are ascribed to "spin vortices", regions in which the spins are inclined to the surface in a circular pattern. These arise because they provide partial flux closure within the crystal, thus reducing the surface energy. As the magnetizing field decreases, the spin inclinations increase, and the disturbance penetrates more deeply into the crystal. Finally spin reversal occurs in the center of the vortex, and a reverse magnetization nucleus is formed. These nuclei grow into spike shaped domains..If this interpretation of the observations is correct, the intersections of the wall of such a spike domain with a plane parallel to the magnetic axis should have opposite polarities; this was observed to be the case in cobalt. The domains in Co and in MnBi alloy were observed to increase in size with increasing temperature, although the saturation magnetization did not change significantly over the temperature range concerned, the crystal anisotropy decreased markedly, and no domains of closure could be found. This behavior is ascribed to spin disorientation at the higher temperatures, resulting in internal flux closure and decreased surface energy. This interpretation is supported

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550220016-9"

ACCESSION NR: AP4023406

by the fact that the contrast of the domains as observed with the longitudinal Kerr effect, as well as that of the spots on the basal plane as observed with the polar Kerr effect, decreased with increasing temperature. This increase in spin disorientation with increasing temperature could be due to increasing influence of crystal imperfections as the crystal anisotropy decreases. The magnetostriction of silicon iron in the [100] direction, which should vanish in an ideal crystal, was found to depend strongly on the annealing process to which the crystal had been subjected. The less thoroughly annealed specimens showed greater magnetostriction and less perfect domain structure. This indicates departure from uniform magnetization within the domains due to crystal imperfections. It is concluded that investigation of the departure from homogeneity of the magnetization within the domains is prerequisite to a deep understanding of various properties of ferromagnetic materials. Orig.art.has: 4 figures.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR)

SUBMITTED: 00 DATE ACQ: 10Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 002 OTHER: 000

Card 3/3

SHUR, Ya.S.; DRAGOSHANSKIY, Yu.N.

Nucleation and growth of magnetic reversal in cobalt crystals. Fiz. met. i metalloved. 19 no.4:536-543 Ap '65. (MIRA 18:5)

1. Institut fiziki metallov AN SSSR.

L 50984-65 EWT(1)/EPA(s)-2/EWT(m)/EWP(1)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) Pt-7/Pi-4
IJP(c) JD/GG

ACCESSION NR: AP5011464 UR/0048/65/029/004/0706/0710

AUTHOR: Shur, Ya. S.; Glazer, A. A.; Tagirov, R. I.; Potapov, A. P.

TITLE: Concerning the nature of uniaxial anisotropy of thin ferromagnetic films /Report, Second All-Union Symposium on Thin Ferromagnetic Films held in Irkutsk 10-15 July 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 4, 1965, 706-710

TOPIC TAGS: ferromagnetic thin film, magnetic anisotropy, permalloy

ABSTRACT: While it is a familiar fact that thin ferromagnetic films prepared by vacuum evaporation onto substrates in a magnetic field exhibit uniaxial anisotropy, the nature and origin of this anisitropy are still obscure. Accordingly, the aim of the present work was to identify the possible reason for appearance of uniaxial anisotropy on the basis of investigation of some of the pertinent properties of Permalloy films. The results of a series of experiments showed that uniaxial anisotropy of Permalloy films, at any rate, is not connected with so-called "oriented superstructure". Note is made of the singular characteristics of the hysteresis loops of Permalloy films and the fact that the relative residual magnetization of films differs from that of bulk specimens. The effect of annealing at different

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L 50984-65

ACCESSION NR: AP5011464

temperatures on some of the magnetic and electric properties of Permalloy films is discussed (after annealing at 400° 79 Permalloy films become isotropic). It is concluded that the cause of uniaxial anisotropy in thin polycrystalline films is shape (geometric) anisotropy of the single domain grains, separated from each other by less magnetic boundaries. The size of the grains must be small (not over a few hundred Angstroms) so that the grains will be single domain ones and the volume of the intergrain boundries will be commensurate with the volume of the grains. It follows that uniaxial anisotropy need not be restricted to very thin films, but might be evinced even in "bulk" specimens, provided they are composed of sufficiently small grains of elongated shape and arrayed with their longest axes in the same direction. Orig. art. has: 2 figures.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00 SUB CODE: EM, MM

NR REF SOV: 003 OTHER: 005

Card 2/2

L 40772-65 EWT(l)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c) Pad/Pi-4 IJP(c)
JD/HW/GG

ACCESSION NR: AP5006490 S/0056/65/048/002/0442/0444

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AUTHORS: Shur, Ya. S.; Kandaurova, G. S.; Onopriyenko, L. G.

TITLE: Angular dependence of the coercive force in magnetically uniaxial ferromagnetic single crystals 14

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 442-444

TOPIC TAGS: coercive force, ferromagnetic crystal, single crystal, spontaneous magnetization 21

ABSTRACT: Since earlier calculations of the angular dependence did not take into account the rotations of the spontaneous magnetization vectors under the influence of the field component perpendicular to the easy-magnetization axis, and also disregarded the effect of the demagnetizing fields of the sample, the authors calculated the angular dependence of the coercive force with a more complete account of

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the effective magnetic fields that determine the dependence. The calculations were made for a magnetically uniaxial single crystal specimen possessing a domain structure and having the form of an ellipsoid. The calculations were compared with experimental data obtained for a single crystal disc of cobalt 9.8 mm in diameter and 1.4 mm high. The coercive force was measured by the ballistic throw method, using a photocompensated microvolt-ampere-weber meter. The coercive force measurements were made in such a way that the state of residual magnetism of the specimen was unambiguous. The experimental results are in agreement with the theoretical formula, which is thus shown to take sufficiently complete account of all the fundamental factors that determine the angular dependence of the coercive force in a multidomain magnetically uniaxial single crystal. Orig. art. has: 1 figure and 7 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Metal Physics, Academy of Sciences SSSR)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550220016-9"

L 47374-65 EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t) Pf-4/Pad IJP(c)
MJW/JD/HW

ACCESSION NR: AP5008737 S/0056/65/048/003/0814/0817

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AUTHORS: Luzhinskaya, M. G.; Shur, Ya. S.

TITLE: Macroscopic domains in high-coercivity alloys with single-domain magnetic structure

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 3, 1965, 814-817

TOPIC TAGS: magnetic alloy, high coercivity alloy, microscopic domain, domain structure, single crystal, polycrystal/Alnico, Vicalloy

ABSTRACT: To explain the character and role of the interaction of single-domain particles in high-porosity alloys, and to investigate the domain structure whose existence is due to parallel orientations of the moments of isolated ferromagnetic regions, experiments were set up in which it was possible to take rigorous account of the magnetic anisotropy and to regulate it. To this end, the authors studied the

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L 47374-65

ACCESSION NR: AP5008737

domain structure in single crystals of Alnico (24% Co, 14% Ni, 8% Al, 3% Cu, remainder Fe), obtained from a polycrystalline ingot and subjected to thermomagnetic treatment, and specimens of the alloy Vicalloy (52% Co, 12% V, remainder Fe), which was polycrystalline. Both samples were tested under the influence of tensile stresses at the time of observation. In both cases the domain structure had the form of bands oriented at a certain angle to the axis of easy magnetization. The observed macroscopic nonuniformity of the magnetization on the surface of single crystals of Alnico in the high coercivity state was qualitatively different from the form of the domain structure of uniaxial ferromagnets with a multidomain magnetic structure. An important difference was the arrangement of the domain boundaries not along the magnetic axis but at certain angles to it. These angles decreased with increasing the total magnetic anisotropy. A qualitative model for the origin of the observed domains is proposed. Orig. art. has: 3 figures.

Card 2/3

L 47374-65

ACCESSION NR: AP5008737

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Metal Physics, Academy of Sciences SSSR)

SUBMITTED: 22Sep64 ENCL: 00 SUB CODE: EM, MM

NR REF SOV: 001 OTHER: 002

Card 3/3 CC

SHUR, Ya.S.; KANDAUROVA, G.S.; SNOPKIYENKO, L.G.

Angular dependence of the coercive force in magnetically uniaxial ferromagnetic single crystals. Zhur. eksp. i teor. fiz. 48 no.2:442-444 F '65. (MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

LOZINSKAYA, M.G., SHUR, Ya.S.

Macroscopic domains in high-coercivity alloys with a single-domain magnetic structure. Zhur. eksp. i teor. fiz. 48 no.3:814-817 Mr '65. (MIRA 18:6)

1. Institut fiziki metallov AN SSSR.

L 14988-66 EWT(1)/EWP(e)/EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) IJP(c) JD/GG

ACC NR: AP5028555 (N) SOURCE CODE: UR/0126/65/020/005/0673/0682

AUTHOR: Kandaurova, G. S.; Shur, Ya. S.

ORG: Ural gosuniversitet im. A. M. Gor'kiy (Ural'skiy gosuniversitet); Institute of Physics of Metals AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: Origin and formation of domain structure in magnetically uniaxial ferromagnets. I

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 5, 1965, 673-682

TOPIC TAGS: magnetization, magnetic domain structure, ferromagnetic material, cobalt, metal physics, magnetic property, single crystal

ABSTRACT: Powder figures of domain boundaries were used to study magnetization in magnetically uniaxial crystals of cobalt and magnetic plumbite. The origin and formation of the domain walls as a function of lowering of the magnetic field were studied. The field was applied parallel to the axis of easy magnetization. Both crystals had a hexagonal structure while the hexagonal axis was the axis of easy magnetization. Cobalt single crystals were used in the form of thin sheets 0.8 mm

UDC: 538.24

Card 1/5

thick and 100 mm^2 in surface area; the surface of the crystal was close to the basal plane. The magnetic plumbite was also in the form of single crystal sheets with thicknesses ranging from 0.6 to 3 mm. The powder figures were obtained while the crystals were subjected to magnetic fields perpendicular to the surface of the sheets of varying intensity. The origin of the domains in cobalt was at the edges of the single crystal, limited only by the flatness of the sample. The results for cobalt are presented in figure 1. The experimental conditions in obtaining the pattern were discussed. However, no generalizations were attempted until further results were obtained with the magnetic plumbite having a similar structure. A magnetization curve was given in which both the magnetization and the surface density of patch-like domains were plotted as functions of field. An explanation was offered for the results in terms of an electron spin model for the domain boundaries. It was established that at saturation, the domain boundaries of both crystals tend to decrease their density. As a result, cylindrical domains of reverse magnetic phase appear, which gives rise to the powder figures (shaped like round patches) of varying dimensions. With increase in applied field these convert to cone shaped domains. It was concluded that the existence of the reverse magnetic embryo would be of general utility in explaining the appearance, formation and disappearance of the domain structure of massive magnetically uniaxial crystals during their reverse magnetization. Orig. art. has: 5 figures.

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ACC NR: AP5028555

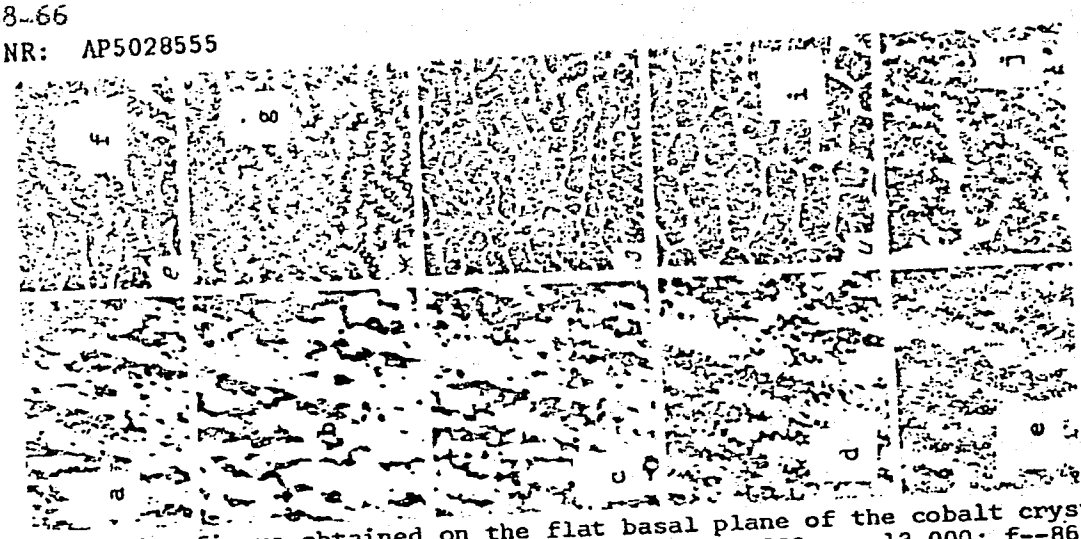

Fig. 1. Powder figure obtained on the flat basal plane of the cobalt crystal with the fields: a--17,000; b--14,600; c--14,500; d--13,900; e--13,000; f--8600; g--150; h--7200; i--11,500; j--13,400 oersteds. Field directed perpendicular to the surface observed.

Card 3/5

L 14988-66
ACC NR: AP5028555

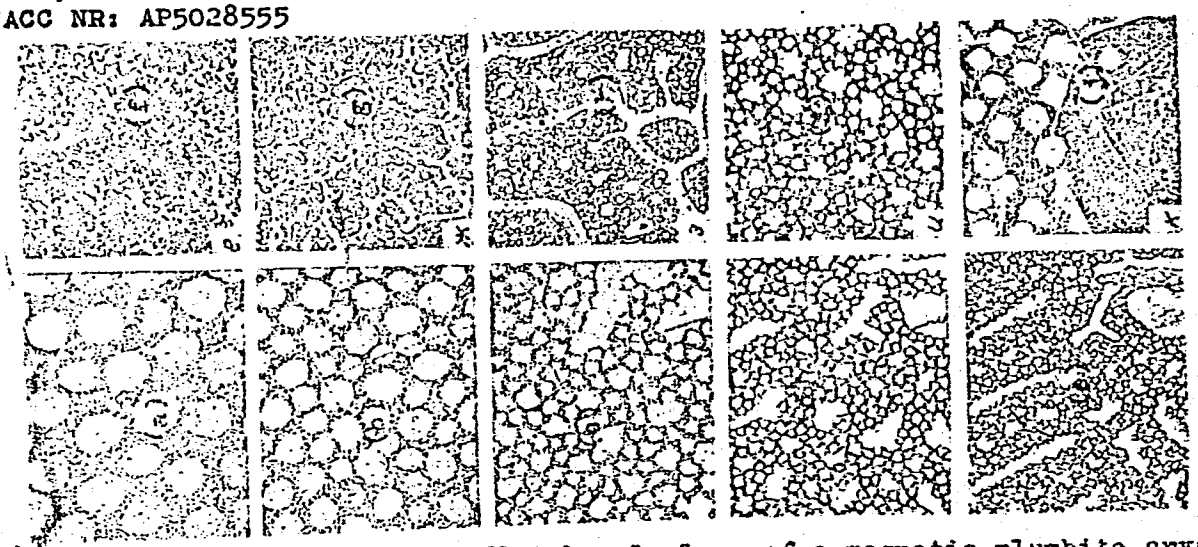

Fig. 2. Powder figure for the flat basal plane of a magnetic plumbite crystal with the fields: a--2530; b--2470; c--2150; d--2020; e--1530; f--580; g--(-1140); h--1700; i--2360; j--(-2700) oersteds. Field directed perpendicular to the observed surface

Card 4/5

L 14988-66
ACC NR: AP5028555

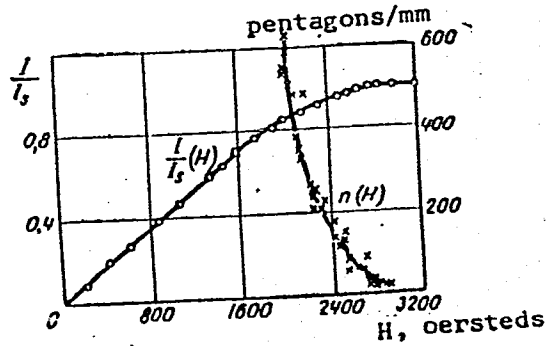

Fig. 3. Magnetization curve $\frac{I}{I_s}(H)$ and the curve showing surface pentagon density as a function of field $n(H)$ for the magnetic plumbite crystal.

SUB CODE: 11,20/ SUBM DATE: 06Apr65/ ORIG REF: 006/ OTH REF: 004

Card 5/5

L 15185-66 EWT(1)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) IJP(c) JD/HW/JG

ACC NR: AP6002672 SOURCE CODE: UR/0126/65/020/006/0939/0942

AUTHOR: Shur, Ya. S.; Mishin, D. D.; Dunayev, F. N.; Pleshchev, V. G.

ORG: Ural State University (Ural'skiy gosuniversitet im. A. M. Gor'kogo)

TITLE: Temperature-induced magnetic hysteresis in the high-coercivity alloy Co-Pt

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 6, 1965, 939-942

TOPIC TAGS: magnetic hysteresis, magnetic coercive force, temperature dependence, cobalt containing alloy, platinum containing alloy, magnetic structure

ABSTRACT: Cyclic variation in the temperature of a ferromagnetic present in a weak magnetic field (compared with the magnitude of the coercive force) leads to an irreversible change in the extent of its magnetization. This phenomenon is termed temperature-induced magnetic hysteresis (TMH) and is due to the attendant reorganization of domain structure. If the type of domain structure changes along with the temperature, irreversible processes of the displacement of domain walls also occur; it is this that leads to TMH. It appears that marked inhomogeneities of magnetic structure, reflecting the heterogeneity of crystalline structure, should exist in the alloy Co-Pt when in high-coercive state: roughly an half of the alloy's volume is occupied by fine-disperse particles (30-50 Å) of the ordered phase separated by the disordered phase. This alloy displays a sharp temperature dependence of the ani-

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L 15185-66
ACC NR: AP6002672

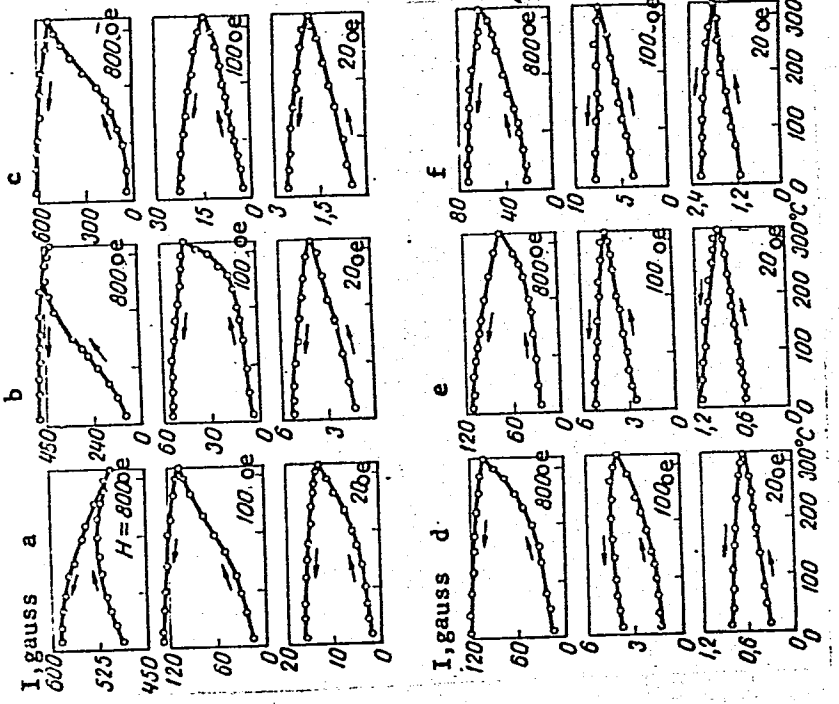

Fig. 1. Temperature dependence of the magnetization of the Co-Pt alloy in various structural states in the presence of the cyclic variation in temperature 20 → 320 → 20°C

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ACC NR: AP6002672

sotropy constant, which also should lead to a change in magnetic structure. Hence it may be assumed that such an alloy must display a marked TMH. To verify this assumption cylindrical (length 2 cm, diameter 0.45 cm) specimens of Co-Pt alloy of equiatomic composition were subjected to various types of heat treatment (quenching from 1000°C at 1.7 deg/sec, with or without tempering at 600 or 700°C for from 20 min to 3.5 hr). Observations of the course of magnetization in the presence of cyclic changes in temperature from 20 to 320°C and from 20 to 520°C (above Curie point) were performed by the magnetometric method, with the specimens placed in magnetic fields of 20, 100, 200, 400 and 800 oe. All the specimens displayed high values of TMH, as illustrated, e.g. by Fig. 1. The markedly inhomogeneous magnetic structure in the high-coercivity Co-Pt alloy is present because the ordered-phase particles with a high anisotropy constant K are oriented in the easy directions. At the same time in the disordered phase with low K the spins will deviate from the easy directions and be aligned so as to reduce the density of magnetic charges within the ferromagnetic. With variation in temperature, due to the strong temperature dependence of the ordered-phase K, the type of magnetic structure is altered. If this alteration occurs in the presence of an external field, processes leading to the growth of resultant magnetization will chiefly occur. These processes may be reversible or irreversible; it is the latter that lead to TMH. Orig. art. has: 1 table, 4 figures.

SUB CODE: 11, 20/ SUBM DATE: 22Feb65/ ORIG REF: 005/ OTH REF: 001

Card 3/3 vmb

L 04750-67 EWT(m)/EWP(t)/ETI IJP(c) JD
ACC NR: AP6028126 SOURCE CODE: UR/0048/66/030/006/1030/1034

AUTHOR: Kamilgurova, G. S.; Shur, Ya. S.

ORG: Institute of Metal Physics, Academy of Sciences, SSSR (Institut fiziki metallov Akademii nauk SSSR); Ural State University (Ural'skiy gosudarstvennyy universitet)

TITLE: Concerning the domain structure of magnetoplumbite /Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July 1965 in Sverdlovsk/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 6, 1966, 1030-1034

TOPIC TAGS: ferromagnetism, magnetic domain structure, single crystal, lead compound, iron compound, uniaxial crystal

ABSTRACT: The authors have employed the powder pattern technique to investigate the domain structure on the basal planes of $PbO \cdot 6Fe_2O_3$ crystals. The investigation was undertaken because the theory of J.Kaczer and R.Gemperle (Ceckosl. J. Physics, B11, No. 3, 152 (1961)) does not account for the laminar domains with walls perpendicular to the magnetizing field that have been observed in uniaxial cobalt and magnetoplumbite crystals when the magnetizing field is perpendicular to the easy magnetization axis; the accumulation of more experimental data is regarded as a necessary first step toward the improvement of the theory of magnetic switching in uniaxial crystals.

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L 08759-67
ACC NR: [illegible]

The specimens were 0.68 to 2.4 mm thick plates with areas from 20 to 30 mm^2. The powder patterns were observed on cleaved faces, which required no further processing. The angle θ between the magnetizing field and the hexagonal [0001] axis could be determined within ± 1°, and the magnetizing field could be varied from zero to 20 kOe. Powder patterns were recorded in magnetizing fields of different strengths and at angles θ ranging from 70 to 90°. Seventeen powder pattern photographs are presented and discussed. It is concluded from the observed domain structures that magnetization switching in directions nearly perpendicular to an easy magnetization axis is effected by formation and growth of nuclei of the new magnetic phase. The mechanism of nucleus formation and growth is discussed, but definite conclusions concerning that mechanism cannot be drawn from the available data. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 006/ OTH REF: 003

Card 2/2 bc

EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) JD/GG

ACC NR: AP6000125 SOURCE CODE: UR/0048/66/030/006/1012/1015

AUTHOR: Shur, Ya. S.; Shiryayeva, O. I.

ORG: Institute of Metal Physics, Academy of Sciences, SSSR (Institut fiziki metallov Akademii nauk SSSR)

TITLE: Ferromagnetic resonance in magnetically uniaxial single crystals with different initial domain structures /Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July in Sverdlovsk/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 6, 1966, 1012-1015

TOPIC TAGS: ferromagnetic resonance, magnetic domain structure, lead compound, ferrite, single crystal

ABSTRACT: In order to investigate the influence of domain structure on ferromagnetic resonance (FMR), the authors have measured the high frequency absorption of magnetoplumbite ($PbFe_{12}O_{19}$) single crystal plates at frequencies below the 36.9 kMHz natural FMR frequency. The results obtained with a 0.5 x 0.5 x 0.05 mm specimen cut with the faces perpendicular to the hexagonal axis (which is the easy magnetization axis of the magnetically uniaxial crystal) are presented. For the measurements the specimen was mounted on the end wall of a cylindrical cavity, which was located in the field of an electromagnet and was excited in the H_{112} mode. Before the measurements were made, either honeycomb or maze type domain structures were produced in the

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specimens by magnetizing them to saturation in directions perpendicular or parallel, respectively, to the hexagonal axis. These domain structures were stable in fields up to 11 kOe and disappeared in fields stronger than 15 kOe. Constant frequency absorption curves were recorded in varying applied fields making different angles θ with the hexagonal axis. When θ was 90° there were observed a strong absorption peak at 20.6 kOe and two or three subsidiary peaks (depending on the domain structure; there were three peaks in the case of honeycomb domains and two in the case of maze domains) at fields between 7 and 11 kOe. As θ was decreased the main resonance shifted slightly toward lower fields and the subsidiary peaks approached each other, merging first with each other and finally with the main peak. At $\theta = 67^{\circ}$ there was a single resonance peak, and no resonance was observed with $\theta < 46^{\circ}$. From the fact that different numbers of subsidiary peaks were observed with samples having different initial domain structures it is concluded that domain structure affects FMR absorption. The number of resonance peaks and the θ dependence of the absorption curve for the case of maze type domain structure are in qualitative agreement with the theory of L.G.Onopriyenko, O.I.Shiryayeva, and Ry.S.Shur (Izv. AN SSSR Ser. fiz., 28, 504 (1964)). The reason for the appearance of a third subsidiary peak in the case of honeycomb domain structure is not understood. The model of Onopriyenko et al. of uniformly magnetized cylindrical domains is not adequate to describe the honeycomb domain structure. It is suggested that it may be possible to employ FMR absorption to investigate domain structures in the interior of crystals. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 004

EWP(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AT6008115 SOURCE CODE: UR/0048/66/030/006/1022/1029

AUTHOR: Shur, Ya. S.; Luzhinskaya, M. G.

ORG: Institute of Metal Physics, Academy of Sciences, SSSR (Institut fiziki metallov Akademii nauk SSSR)

TITLE: Domain structure of Alnico single crystals in different structural states /Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 5-7 July 1965 in Sverdlovsk/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 6, 1966, 1022-1029

TOPIC TAGS: ferromagnetism, iron alloy, aluminum alloy , nickel alloy, cobalt alloy, single crystal, magnetic domain structure

ABSTRACT: The authors have investigated by the powder pattern technique the domain structures of single crystal Alnico specimens, possibly of the same 51Fe-24Co-14Ni-8Al-3Cu composition that they investigated earlier (Zh. eksperim. i teor. fiz., 84, 814 (1965)). The specimens were subjected to different heat treatments, with and without the presence of external magnetic fields, which resulted in their having different coercive forces ranging from 1 to 550 Oe. The specimens were cut from single crystals of coarse-grained polycrystalline ingots or were grown by the Bridgman method, and their orientations were determined by x-ray diffraction or from the form of the

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domain structure in the tempered state. The preliminary treatments involved heating, sometimes to as high a temperature as 1300°, cooling at different rates to different temperatures with or without a 3 kOe field parallel to [100], annealing for different times at different temperatures, and/or quenching from different temperatures. Specimens that were quenched from 1300° or were cooled from 1300 to 790° in the absence of a magnetic field and then quenched showed the domain structure characteristic of cubic ferromagnets with three easy magnetization axes. Specimens with low coercive forces that were heat treated in the presence of a magnetic field exhibited domain structures that were conditions by the presence of two anisotropies; the uniaxial anisotropy induced by the thermomagnetic treatment and the natural crystallographic cubic anisotropy. Specimens with high coercive forces exhibited a type of domain structure that has not been previously observed in polydomain ferromagnets. On the planes parallel to the field H_T applied during the heat treatment there were observed bands inclined to H_T. When the magnetizing field was parallel to H_T the powder patterns on the plane perpendicular to H_T were circular (on a square specimen; when the specimen was an elongated rectangle the powder patterns were elliptical), and when the magnetizing field was inclined at 45° to H_T they were arcs of circles with their centers off the specimen. When the magnetizing field was nearly perpendicular to H_T the whole switching process could take place without the appearance of a domain structure. The authors thank L.V. Smirnov for preparing the single crystals and L.M.Magat for determining their crystallographic orientations. Orig. art. has: 8 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 003/ OTH REF: 007

magnetic material

EWP(e)/EWP(m)/EWP(w)/EWP(t)/ETI/EWP(k) IJP(c) JD/JH
ACC NR: AP6027783 SOURCE CODE: UR/0126/66/022/001/0039/0044

AUTHOR: Shur, Ya. S.; Kandaurova, G. S.; Magat, L. M.; Bykhanova, N. N.

ORG: Institute of Metal Physics, AN SSSR (Institut fiziki metallov AN SSSR); Ural State University im. A. M. Gor'kiy (Ural'skiy gosuniversitet)

TITLE: Magnetic properties of powders of a high-coercivity Mn-Al alloy

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 1, 1966, 39-44

TOPIC TAGS: aluminum alloy, magnesium alloy, powder metal property, magnetic property, magnetic coercive force

ABSTRACT: In order to elucidate the mechanism of the processes leading to the increase in the coercive force of Mn-Al alloy when in powdered state, the magnetic properties and phase composition of powders of a Mn-Al alloy (71 wt. % Mn) were investigated as a function of particle size (2 to 800 μ) and heat treatment. Two series of powders were considered: the first series was obtained by pulverizing the alloy when it was in ferromagnetic state (homogenization at 1100°C with cooling in air at the critical rate of 20°C/sec, leading to the formation of the metastable ordered ferromagnetic τ - phase); the second series was obtained by pulver-

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izing the alloy when it was in nonferromagnetic state (quenching in water following homogenization at 1100°C) and in this case the high-temperature paramagnetic ϵ - phase was deformed by supercooling. The magnetic properties of the specimens were measured in fields of up to 32,000 oe by the ballistic method, while their phase composition was determined from debyegrams. Findings: for both series of powder specimens coercive force H_c increases and specific magnetization σ_{max} decreases with decrease in particle size. Thus, a particle size decreases from 500 to 2 μ, H_c increases from 1300-2000 oe to 5000 oe, while specific magnetization then decreases 4-7 times for powders in the first series and about 2 times for powders in the second series. An examination of the anisotropy of coercive force in the specimens warrants the assumption that for specimens with particle size of <4 μ magnetic properties are primarily determined by particles with a nearly monodomain structure, and it is this that accounts for the increase in coercive force. The decrease in specific magnetization with decrease in particle size is attributed to the dis-ordering of the magnetic τ-phase and the formation of paramagnetic equilibrium phases. Deformation of the alloy apparently leads to a decrease in the effective dimension of ordered regions of the ferromagnetic τ-phase and to greater isolation of these regions from each other within the powder particles. This complicates the processes of magnetization reversal and increases the coercive force. The decrease in the effective size of the τ-phase may be attributed, for the first series of powders, to local dis-ordering of the τ-phase during pulverization of the alloy in ferromagnetic state, and for the

second series of powders -- to the formation of nonmagnetic equilibrium phases. "The authors consider it their pleasant duty to express their appreciation to L. V. Smirnov for providing the Mn-Al alloy." Orig. art. has: 2 figures, 1 table.

SUB CODE: 11,13,20/ SUBM DATE: 01Dec65/ ORIG REF: 002/ OTH REF: 005

ACC NR: AP6033565 SOURCE CODE: UR/0181/66/008/010/3022/3031

AUTHOR: Glazer, A. A.; Potapov, A. P.; Tagirov, R. I.; Shur, Ya. S.

ORG: Institute of Physics of Metals, AN SSSR, Sverdlovsk (Institut fiziki metallov AN SSSR)

TITLE: Exchange anisotropy in thin magnetic films

SOURCE: Fizika tverdogo tela, v. 8, no. 10, 1966, 3022-3031

TOPIC TAGS: manganese, permalloy, magnetic anisotropy, ferromagnetic film, antiferromagnetic material, magnetic hysteresis, hysteresis loop, metal diffusion

ABSTRACT: The purpose of the investigation was to study systematically the magnetic properties of two-layer manganese-permalloy films and especially to determine the regularities that result from exchange interaction between the ferromagnetic and antiferromagnetic regions in such substances. The samples were produced in the form of round spots of 18 mm dia. by successive sputtering of layers of manganese and 82-permalloy on discs cut from cover classes in a vacuum of 5×10^{-5} mm Hg. The sputtering was in a magnetic field of 70 Oe at a temperature 250C. The layer thickness was 400 - 1500 Å. The film characteristics measured were the hysteresis loops in different directions in the plane of the film, the torque curves, and the domain structure. The measurements were made after annealing at 350C and cooling in the magnetic field. The films so treated exhibit a domain structure and all the attributes characteristic of substances with exchange (unidirectional) anisotropy, namely a shift in

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ACC NR: AP6033565

the hysteresis loop, proportionality of the torque to the sine of the angle, and loss to rotational hysteresis in strong fields. This anisotropy is apparently due to exchange interaction between the permalloy layer with the antiferromagnetic regions produced by mutual diffusion of the iron, nickel, and manganese. The angular dependence of the magnetic properties can be qualitatively described in terms of the rotation theory, extended to the case of a uniaxial film. The rotational-hysteresis loss is due to inhomogeneity of the exchange anisotropy. The authors thank V. I. Khrabrov for processing the samples in pulsed magnetic fields and A. I. Mitsek for useful discussions. Orig. art. has: 7 figures and 6 formulas.

SUB CODE: 20/ SUBM DATE: 04Apr66/ ORIG REF: 004/ OTH REF: 004

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BAULIN, I.S., inzh.; D'YAKONOV, V.N., kand.tekhn.nauk.; USKOVA, O.N., kand. tekhn.nauk.; SHUR, Ye.A., inzh.; KONYYKHOV, A.D., inzh.; AFANAS'YEV, L.U., inzh.; EVLIKANOV, A.V., inzh.

Investigating the mechanism of rail contact-fatigue damages (defects 82 and 64). Vest.TSNII MPS 21 no.4:27-30 '62. (MIRA 15:6)
(Railroads--Rails--Defects)

KONYUKHOV, A.D., inzh.; SHUR, Ye.A., inzh.

Plastic deformation of rail heads with contact-fatigue destruction.
Vest.TSNII MPS 23 no.2:52-55 '64. (MIRA 17:3)

SHUR, Ye.A., inzh.; RAUZIN, Ya.R., doktor tekhn. nauk

Nonuniformity of the structure of hardened rails. Vest. TSNII MPS 24 no.1:37-41 '65. (MIRA 18:6)

L 00025-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) JD

ACCESSION NR: AP5022576 UR/0129/65/000/009/0021/0025
669.14.018:621.785.545.616

AUTHOR: Shur, Ye. A.; Rauzin, Ya. R.

TITLE: Effect of single and double heat treatment on the properties of medium-carbon low-alloy steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 9, 1965, 21-25, and insert facing p. 24

TOPIC TAGS: metal heat treatment, carbon steel, low alloy steel, fatigue strength, hardness, impact strength, tensile strength, plastic strength

ABSTRACT: The structure and properties of medium-carbon low-alloy steel subjected to double heat treatment (martempering) were compared with the structure and properties of the same steel when subjected to single heat treatment (direct formation of ferrite-carbide mixture from austenite). The microstructure of martempered specimens was sorbitic, while that of specimens subjected to single heat treatment was chiefly bainitic. Tensile, fatigue, notch, and wear-resistance tests of specimens with the same hardness (H_{RC} 38-50) showed that the yield point

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ACCESSION NR: AP5022576

of the martempered specimens is 15-20 kg/mm^2 higher than that of specimens subjected to single heat treatment. Relative elongation and reduction of area in martempered specimens, on the other hand, were lower than in specimens subjected to single heat treatment, which indicates a high plasticity margin following single heat treatment. Tensile strength and fatigue limit are more or less the same whatever the regime of heat treatment, which indicates that the static and cyclic strength of the steel with sorbitic structure is affected not by the fine structure of ferrite but by the dispersity of carbides. The other properties (plasticity, ratio of yield point to strength, wear resistance), which are more associated with the fine structure of the ferritic base of steel, at H_{RC} 38-45 are higher following single heat treatment than following martempering. All this points to certain advantages of the single heat treatment of medium-carbon low-alloy steel with Rockwell hardness of 38-50. At lower hardness, martempering causes higher impact strength, which should be taken into account for products performing under conditions of dynamic loading. Orig. art. has: 6 figures

ASSOCIATION: Tsentral'nyy institut zheleznodorozhnogo transporta (Central Institute of Railroad Transport)

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ACCESSION NR: AP5022576

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, SS

NO REF SOV: 002 OTHER: 001

Card 3/3

RAUZIN, Ya.B.; VELIKANOV, A.V.; GORDYUK, Yu.V.; SHUR, Ye.A.

Investigating the structure and properties of rails hardened along their entire length by induction heating. Stal' 25 no.12:1122-1126 D '65. (MIRA 18:12)

SHUR, Ye.I.

On the mechanism of the effect of lumbar novocain block on reflexes from interoreceptors in aseptic inflammation. Vest. khir. 71 no.2: 74 1951. (CIML 20:8)

SHUR, Ye.I.; PROKOPENKO, V.G., zaveduyushchiy; VISHNEVSKIY, A.A., chlen-korrespondent Akademii meditsinskikh nauk SSSR, direktor.

Problem of central effects upon the interoceptor reflexes in aseptic inflammation and the effect of a lumbar novocaine block. Vop.fiziol.int. no. 1:582-595 '52. (MLRA 6:8)

1. Fiziologicheskaya laboratoriya Instituta khirurgii im. A.V.Vishnevskogo Akademii meditsinskikh nauk SSSR (for Prokopenko). 2. Institut khirurgii im. A.V.Vishnevskogo Akademii meditsinskikh nauk SSSR (for Vishnevskiy). 3. Akademiya meditsinskikh nauk SSSR (for Vishnevskiy).
(Reflexes) (Novocaine) (Inflammation)

SHUR, Ye. I.

SHUR, Ye.I., kandidat biologicheskikh nauk

Mechanism of action of a novocaine lumbar block on reflexes from interoceptors in aseptic inflammation. Trudy AMN SSSR 24 no.2: 165-176 '53. (MLRA 7:7)

(PROCAINE, effects,
*lumbar block, eff. on reflexes from interoceptors in exper. inflamm.)
(INFLAMMATION, experimental,
*eff. of procaine lumbar block on reflexes from interoceptors in)
(ANESTHESIA, REGIONAL,
*lumber block, procaine, eff. on reflexes from interoceptors in exper. inflamm.)

SHCHUTSKIY,S.V., redaktor; SHUR,Ye.I., redaktor; KRLIKH,Ye.Ya., tekhnicheskiy redaktor

[Vinyl plastic; brief review of its properties and methods of working it] Viniplast; kratkii obzor svoistv i metodov obrabotki. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1955. 33 p. (MLRA 9:3)

1. Okhtenskiy khimicheskiy kombinat.
(Vinyl polymers)

GARBAR, M.I., redaktor; SHUR, Ye.I., redaktor; KRLIKH, Ye.Ya., tekhnicheskiy redaktor

[Polyethylene; a reference manual] Polietilen; spravochnoe rukovodstvo. Leningrad, Gos.nauchno-tekhn.izd-vo khimicheskoi lit-ry, 1955. 41 p. (MLRA 9:3)

1. Russia (1923- U.S.S.R.) Ministerstvo khimicheskoy promyshlennosti.

(Polyethylene)

'ARONSON, A.S.; ESMAN, P.I., redaktor; SHUR, Ye.I., redaktor; ERLIKH, Ye.Ya., tekhnicheskiy redaktor.

[Technology of preliminary processes in the rubber industry] Tekhnologiia podgotovitel'nogo proizvodstva v rezinovoi promyshlennosti. Leningrad, Gos.nauchno-tekhn. izd-vo khim. lit-ry, 1955. 185 p. (Rubber industry) (MLRA 9:6)

DRINBERG, A.Ya.; FUNDYLER, B.M., kand.tekhn.nauk, red.; SHUR, Ye.I., red.; ERLIKH, Ye.Ya., tekhn.red.; FOMKINA, T.A., tekhn.red.

[Technology of film-forming materials; natural and synthetic resins, drying oils, lacquers and paints] Tekhnologiia plenkoobrazuiushchikh veshchestv; natural'nye i sinteticheskie smoly, olify, laki i kraski. Izd. 2., perer. i dop. Leningrad, Gos. nauchno-tekhn.izd-vo khim. lit-ry, 1955. 651 p. (MIRA 11:6)
(Films (Chemistry))

SHIFRINA, V.S.; SAMOSATSKIY, N.N.; SHCHUTSKIY, S.V., red.; SHUR, Ye.I., red.; FOMKINA, T.A., tekhn.red.

[High-pressure polyethylene; reference manual] Polietilen vysokogo davleniia; spravochnoe rukovodstvo. Pod red. S.V. Shchutskogo. Izd.2., dop. Leningrad, Gos.nauchno-tekhn. izd-vo khim.lit-ry, 1958. 89 p. (MIRA 12:7)
(Polyethylene)

ANDREYEVA, I.N.; ARKHIPOVA, Z.V.; VESELOVSKAYA, Ye.V.; LEVINA, A.A.; ANTOKOL'SKAYA, Ye.M.; LAZAREVA, N.P.; SAZHIN, B.I.; KHIN'KIS, S.S.; SHCHERBAK, P.N.; GERBIL'SKIY, I.S.; LYANDZBERG, G.Ya.; PARAMONKOVA, G.V.; PECHENKIN, A.L.; YEGOROV, N.M., obshchiy red.; SHUR, Ye.I., red.; ERLIKH, Ye.Ya., tekhn.red.

[Low-pressure polyethylene] Polietilen nizkogo davleniia. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1958. 90 p. (Polyethylene)

MINDLIN, Semen Solomonovich; SAMOSATSKIY, Nikolay Nikolayevich; SHUR, Ye.I., red.; FOMKINA, T.A., tekhn.red.

[Manufacture of ployethylene articles by the extrusion process] Proizvodstvo izdelii iz polietilena metodom ekstruzii. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1959. 94 p. (MIRA 12:7)

(Polyethylene) (Plastics)

TEMNIKOVA, Tat'yana Ivanovna; KHAVIN, Z.Ya., red.; SHUR, Ye.I., red.; ERLIKH, Ye.Ya., tekhn.red.

[Theoretical fundamentals of organic chemistry] Kurs teoreticheskikh osnov organicheskoi khimii. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1959. 808 p. (MIRA 12:8)
(Chemistry, Organic)

ANDREYEVA, I.N.; ARKHIPOVA, Z.V.; VESELOVSKAYA, Ye.V.; LEVINA, A.A.; ANTOKOL'SKAYA, Ye.M.; LAZAREVA, N.P.; SAZHIN, B.I.; KHIN'KIS, S.S.; SHCHERBAK, P.N.; GERBIL'SKIY, I.S.; LYANDZBERG, G.Ya.; PARAMONKOVA, T.V.; PECHENKIN, A.L.; YEGOROV, N.M., red.; SHUR, Ye.I., red.; FOMKINA, T.A., tekhn.red.

[Low-pressure polyethylene] Polietilen nizkogo davleniia. Izd.2., ispr. i dop. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1960. 95 p. (MIRA 14:1)

1. Nauchno-issledovatel'skiy institut polimerizatsionnykh plastmass (for all, except Yegorov, Shur, Fomkina).
(Polyethylene)

SHUR, Ye.I., red.; FOMKINA, T.A., tekhn.red.

[Methods for the analysis of products obtained in the manufacture of synthetic rubber] Metody analiza produktov proizvodstva sinteticheskogo kauchuka. Leningrad, Gos.nauchno-tekhn.izd-vo khim. lit-ry, 1960. 121 p. (MIRA 13:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V.Lebedeva.
(Rubber industry--By-products)

CHEGODAYEV, D.D.; NAUMOVA, Z.K.; DUNAYEVSKAYA, TS.S.; CHERESHKEVICH, L.V., red.; SHUR, Ye.I., red.; ERLIKH, Ye.Ya., tekhn.red.

[Fluoroplasts] Ftoroplasty. Pod red. L.V.Chereshkevicha. Izd.2., dop. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1960. 190 p. (MIRA 13:12)

1. Nachal'nik laboratorii ftoroplastov Nauchno-issledovatel'skogo instituta polimerizatsionnykh plastmass (Leningrad) (for Chereshkevich).

(Fluoroplast)

GARMONOV, I.V., otv.red.; KOROTKEVICH, B.S., otv.red.; ZONIS, S.A., red.; SHUR, Ye.I., red.; FOMKINA, T.A., tekhn.red.

[Synthesis of monomers for the production of synthetic rubber] Sintez monomerov dlia proizvodstva sinteticheskogo kauchuka. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1960. 250 p. (MIRA 13:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka.

(Rubber, Synthetic)

PODDUBNYY, I.Ya., prof., red.; SHUR, Ye.I., red.; FOMKINA, T.A., tekhn. red.

[Physicochemical methods used in the analysis and investigation of products of the synthetic rubber industry] Fiziko-khimicheskie metody analiza i issledovaniia produktov proizvodstva sinteticheskogo kauchuka. Pod red. I.IA.Poddubnogo. Leningrad, Gos.nauchno-tekhn.izd-vo khim.lit-ry, 1961. 151 p. (MIRA 14:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka.

(Rubber, Synthetic)

SHIFRINA, Vitta Samsonovna; SAMOSATSKIY, Nikolay Nikolayevich; SHCHUTSKIY, S.V., red.; SHUR, Ye.I., red.; ERLIKH, Ye.Ya., tekhn. red.

[Polyethylene production and properties] Polietilen; poluchenie i svoistva. Pod red. S.V.Shchutskogo. Izd.3., dop. i ispr. Leningrad, Gos. nauchno-tekhn. izd-vo khim. lit-ry, 1961. 174 p. (MIRA 14:8)

(Polyethylene)