L 38537-65

ACCESSION NR: AP5005285

pensation of the magnetic moments of the sublattices (θ_c) there is a complicated anomaly in the plot of $\ln(\theta_c/T)$. The experimental results are in qualitative agreement with the theoretical deductions of Ye. A. Turov et al (Collection "Ferriti" [Ferrites], Izd. AN BSSR, Minsk, 1960). The greater anomaly in the ferrite investigated in the present research, as compared with the previously investigated ferrite, is due to the lower resistivity and to the strong increase in magnetization on going through the compensation point. Orig. art. has: 3 figures and 1 formula.

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

SUBMITTED: 23Jul64 ENCL: 00 SUB CODE: EC, EM

NR REF SOV: 004 OTHER: 002

Card 2/2 pb

L 38536-65 EED-2/EWT(l)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) LJP(c) JD/JG

ACCESSION NR: AP5005286 S/0181/65/007/002/0477/0479

AUTHOR: Belov, K. P.; Zaytseva, M. A.; Kadomtseva, A. M.; Ozchinnikova, T. L.

TITLE: On the electric properties of yttrium ferrites with garnet structure

SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1965, 477-479

TOPIC TAGS: yttrium iron garnet, ferrite, temperature dependence, electric resistivity, resistivity anomaly

ABSTRACT: The authors measured the temperature dependence of the electric resistivity of samples of the following composition: $Y_3Fe_5O_{12}$, $Y_{2.5}Mn_{0.5}Fe_{4.5}Ge_{0.5}O_{12}$, $Y_{2.5}MnFe_{4.0}GeO_{12}$, $Y_{2.5}Mn_{0.5}Fe_{4.5}Ti_{0.5}O_{12}$, and $Y_{2.0}MnFe_{4.0}TiO_{12}$. The samples were prepared under the same conditions as in an earlier investigation (Kristallografiya v. 7, 242, 1962). The resistivity measurements were made in vacuum using direct current, at temperatures from room to 600K. The results show that the substitution of the Fe^{3+} ion by the tetravalent ions Ge^{4+} and Ti^{4+}, which occupy different crystallographic places in the iron-garnet structure, leads to a decrease in the electric resistivity (by several orders of magnitude compared with the pure

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L 38536-65

ACCESSION NR: AP5005286 2

iron-garnet). The observed decrease in the electric resistivity is due to the appearance of Fe^{2+} ions, located in both cases in octahedral sites. The temperature dependence of the electric resistivity displays kinks in the region of the Curie temperature. These anomalies are similar to those observed for ferrites with spinel structure. "The authors thank Yu. P. Irkhin for valuable advice and a discussion of the results." Orig. art. has: 2 figures.

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

SUBMITTED: 23Jul64 ENCL: 00 SUB CODE: EC, EM

NR REF SOV: 004 OTHER: 003

Card 2/2 pjb

L 51405-65 EWT(1) IJP(c)

ACCESSION NR: AF5010698 UR/0181/65/007/004/0981/0984

AUTHOR: Belov, K. P.; Talalayeva, Ye. V.; Kudryavtseva, T. V.

TITLE: Thermomagnetic and galvanomagnetic effect in manganese ferrite

SOURCE: Fizika tverdogo tela, v. 7, no. 4, 1965, 981-984

TOPIC TAGS: ferrite, manganese ferrite, thermomagnetic effect, galvanomagnetic effect, magnetic ordering

ABSTRACT: A simultaneous investigation was made of the even thermomagnetic and galvanomagnetic effects in the same sample of single-crystal manganese ferrite. Two samples were tested, one containing 6.5% excess of manganese, and the other containing an excess of iron with composition $Mn_{0.87}Fe_{2.13}O_4$. The thermomagnetic effect was measured by a null method using a photocompensation microvolt-ampere-Weber meter F-18. The galvanomagnetic effect was measured by a bridge method, and the magnetization by a ballistic method. The results showed that the thermomagnetic and galvanomagnetic effects have different behaviors. The thermomagnetic effect has a maximum growth in the region of weak fields (in displacement and rota-

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L 51405-65
ACCESSION NR: AP5010698

tion processes), whereas the galvanomagnetic effect has the maximum growth in strong fields (in the region of the para-process). The difference is attributed to the different mechanisms whereby the magnetic ordering (domain and spin) in the ferrite acts on the thermoelectric power and on the electric conductivity. Orig. art. has: 4 figures.

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

SUBMITTED: 22Jul64 ENCL: 00 SUB CODE: SS, EM

NR REF SOV: 009 OTHER: 000

Card 2/2

L 5'7587-65 EWT(l)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EED-2/EWP(b)/EWA(c) IJP(c)
JD/JG
ACCESSION NR: AP5013717 UR/0070/65/010/003/0351/0356
548.0:538

33
32
B

AUTHOR: Belov, K. P.; Lyubutin, I. S.

TITLE: The magnetic properties of substituted gadolinium and yttrium garnet ferrites

SOURCE: Kristallografiya, v. 10, no. 3, 1965, 351-356

TOPIC TAGS: magnetic property, garnet, ferrite

ABSTRACT: The effect of temperature on spontaneous magnetization was studied in two systems of substituted garnet ferrites: ($Y_{3-x}Ca_xFe_{5-x}Sn_xO_{12}$ and $Gd_{3-x}Ca_xFe_{5-x}Sn_xO_{12}$; $0 \leq x \leq 3$). The two systems were synthesized using conventional techniques. The Fe^{3+} ions were replaced with nonmagnetic Sn^{4+} ions and to preserve neutrality the Y^{3+} and Gd^{3+} ions were replaced with Ca^{2+} ions. The variation in spontaneous magnetization of the C sub-lattices was measured. X-ray analysis showed that all compositions had a garnet structure. Magnetization was measured using ballistic methods in fields up to 2000 oersteds. The value of σ_s was measured by

Card 1/2

L 57587-65
ACCESSION NR: AP5013717

extrapolating the linear part of the isothermal curve to $H = 0$. Measurements showed that a field of 2000 oersteds was sufficient to saturate the samples up to $x = 1.2$. Curie points were determined from the point where the tangent to the $\sigma_s(T)$ curve at the point of inflexion intersects the x-axis. It was established that all ferrites of the Gd system have compensation points. The difference between the Curie point and the compensation point reaches a maximum value when $x \simeq 0.5$. Orig. art. has: 6 figures, 1 table, 2 formulas.

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

SUBMITTED: 17Jul64 ENCL: 00 SUB CODE: EM, SS

NO REF SOV: 003 OTHER: 005

Card 2/2

L 47359-65 EPF(c)/EPF(n)-2/EPR/ENG(c)/EEC(k)-2/EWT(d)/EWT(l)/EWT(m)/ENP(b)/T/
ENP(t) Pr-4/Pu-4 IJP(c) WW/JD/JG

ACCESSION NR: AP5008761 S/0056/65/048/003/0979/0981

AUTHOR: Belov, K. P.; Sokolov, V. I. 31 30 B

TITLE: Magnetostriction of rare earth ferrite garnets at low temperatures 21

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 3, 1965, 979-981

TOPIC TAGS: rare earth element, ferrite garnet, magnetostriction, low temperature behavior

ABSTRACT: In view of the lack of published data on the magnetostriction of rare earth ferrite garnets below the temperature of liquid nitrogen, the authors have used the differential capacity method to measure the magnetostriction of polycrystalline ferrite garnets $R_3Fe_5O_{12}$ (R = Gd, Tb, Dy, Ho, Er, and Yb) in the temperature range 4.2--100K. The ferrites were prepared by the usual ceramic technique. The temperature dependences of the magnetostriction in a longitudinal magnetic field of 5000 Oe are shown in Fig. 1 of the Enclosure. For most of the investigated ferrites, the temperature range of the measurements (up to 100K) was lower

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L 47359-65
ACCESSION NR: AP5008761

than the compensation point (except for Yb and Er). Some unexplained sharp variations of the magnetostriction of some ferrites in the vicinity of the compensation point are briefly discussed. Orig. art. has: 2 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 16Dec64 ENCL: 01 SUB CODE: SS, IC

NR REF SOV: 000 OTHER: 003

Card 2/3

L 5329-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/GG
ACCESSION NR: AP5021101 UR/0056/65/049/002/0414/0419

AUTHORS: Belov, K. P.; Yergin, Yu. V.; Ped'ko, A. A. 72 69 B

TITLE: Magnetostriction of a gadolinium single crystal

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 414-419

TOPIC TAGS: gadolinium, magnetostriction, magnetization, Curie point, temperature dependence

ABSTRACT: The magnetostriction of a gadolinium single crystal in various crystallographic directions was measured as a function of the magnetic field strength and of the temperature by a tension gauge method in fields up to 15,000 Oe and in the temperature interval 78 -- 350K. It is found that the paraprocess magnetostriction is large not only in the vicinity of the Curie temperature, but at lower temperatures, beginning with 180K. The spontaneous magnetostriction caused by the change of exchange energy on passing through the Curie point was calculated and found to be sharply anisotropic. The curves

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L 5329-66

ACCESSION NR: AP5021101 3

for the temperature variation of the saturation magnetostriction, obtained after subtracting the paraprocess magnetostriction, have a complicated form. Some of these curves have maxima in the temperature interval between 200 and 250K. It is concluded therefore that the behavior of the magnetostriction in gadolinium in this temperature interval cannot be attributed only to processes of rotation of the spontaneous magnetization vector against the magnetic anisotropy forces. Orig. art has: 7 figures, 2 formulas, and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

55 44

SUBMITTED: 05Mar65 ENCL: 00 SUB CODE: SS, EM

NR REF SOV: 005 OTHER: 005

Card 2/2 Wd

L 58457-65 EWT(1) Peb DIAAP/IJP(c)
ACCESSION NR: AP5013668 UR/0386/65/001/001/0026/0031

AUTHOR: Belov, K. P.; Igubutin, I. S.

TITLE: Mossbauer effect at Sn-119 nuclei introduced into yttrium iron garnet lattice

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 1, 1965, 26-31

TOPIC TAGS: Mossbauer effect, yttrium iron garnet, effective field, tin, quadrupole splitting, chemical shift

ABSTRACT: The effect was measured in yttrium iron garnet $Ca_{0.3}Y_{2.7}Sn_{0.3}Fe_{4.7}O_{12}$ in which the Fe^{3+} ions were replaced by Sn^{4+} ions. The resistance of the YIG was on the order of 10^{10}--10^{12} ohm-cm, so that it could be regarded as a dielectric. The source of gamma radiation was Sn^{119} in powdered MgO deposited on a copper [illegible] the thickness of the radioactive layer was 5.5 mg/cm^2. The absorber

L 58457-65
ACCESSION NR: AP5013668

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mechanism. Both at room and at liquid-nitrogen temperature the absorption spectrum consisted of six components. In addition, a small peak is observed in the center of the spectrum, possibly due either to a small amount of non-reacting SnO_2 or to formation of a $CaSnO_3$ phase with perovskite structure. The values of the effective field H_{ef}, the quadrupole splitting ϵ, and the chemical shift δ for 80 and 295K are:

	T = 80°K	T = 295°K
H_{ef}, kOe	210.5 ± 2	152 ± 3
ϵ, mm/sec	0.17 ± 0.05	0.0 ± 0.1
δ, mm/sec	-1.9 ± 0.1	-1.9 ± 0.1

It follows that the magnetic fields at the tin nuclei in the investigated iron garnet reach large values. They are interpreted as being due to polarization of the electronic core of the tin atom by the exchange fields of the 3d-electrons of the iron atoms. "We are grateful to Academician I. K. Kikoin and to V. I. Niko-

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000204510003-6"

L 58457-65
ACCESSION NR: AP5013668

technical help and numerous valuable consultations." Orig. art. has: 1 figure.

ASSOCIATION: Institut kristallografii Akademii nauk SSSR (Institute of Crystallography, Academy of Sciences, SSSR)

SUBMITTED: 13Feb65 ENCL: 00 SUB CODE: SS, NP

NR REF SOV: 004 OTHER: 003

L 65257-65 EWT(l)/EWP(e)/EWT(m)/EWP(t)/EWP(k)/EWP(z)/EWP(b) IJP(c) JD

ACCESSION NR: AP5014194 UR/0386/65/001/002/0008/0014

AUTHOR: Belov, K. P.; Yergin, Yu. V.; Katsnel'son, A. A.; Ped'ko, A. V.

TITLE: Magnetic properties of gadolinium subjected to high pressure at high temperatures

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 2, 1965, 8-14

TOPIC TAGS: gadolinium, magnetic property, saturation magnetization, high temperature effect, pressure effect

ABSTRACT: Saturation magnetization, Curie point and temperature dependence of paramagnetic susceptibility were measured in gadolinium to determine the cause for lower saturation magnetization in rhombohedral gadolinium as compared with hexahedral gadolinium. X-ray analysis indicates that most lines on the x-ray pattern for rhombohedral gadolinium correspond to a rhombohedral phase of the samarium type. A few weak lines are due to a phase with double hexagonal (four-layer) packing of the lanthanum type. The weak intensity of these lines indicates that the volume occupied by this phase is small. The experimental data indicate that the rhombohedral

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L 65257-65
ACCESSION NR: AP5014194

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modification of gadolinium has a lower effective magnetic moment per atom than gadolinium with a hexagonal structure. This may be caused by rearrangement of the electron structure in the 4f layer in gadolinium subjected to high pressure and heating, similar to the rearrangement observed in cerium. "The authors are grateful to Yu. S. Genshaft and L. D. Livshits for treating the gadolinium specimens in a high pressure chamber, to V. P. Deripasko for taking the -ray photographs and to R. Z. Levitin for taking part in discussions of the resu ." Orig. art. has: 2 figures, 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 24Feb65 ENCL: 00 SUB CODE: SS, EM

NO REF SOV: 001 OTHER: 002

Card 2/2

L 62118-65 EWT(1)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EED-2/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5011505 UR/0188/65/000/002/0092/0094 29
538.145

AUTHORS: Belov, K. P.; Kadomtseva, A. M.; Ovchinnikova, T. L.

TITLE: Electric properties of certain orthoferrites of rare earth elements

SOURCE: Moscow. Universitet. Vestnik. Seriya 3, Fizika, astronomiya, no. 2, 1965, 92-94

TOPIC TAGS: rare earth element, orthoferrite, electric resistivity, temperature variation

ABSTRACT: The authors investigated the temperature dependences of the electric resistivity of polycrystalline samples of orthoferrites of La, Pr, Nd, and Yb, and of several compositions in which part of the iron ions were replaced by other trivalent ions, and also single crystal $YbFeO_3$. The polycrystals were prepared by ordinary ceramic technology, and the single crystal by the method of spontaneous crystallization from solution. The resistivity was measured in vacuum

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L 62113-65

ACCESSION NR: AP5011505

2

with direct current. The magnetic properties of the orthoferrites of rare earth elements were investigated by the authors earlier (ZhETF v. 37, 1160, 1959; Izv. AN SSSR ser. fiz. No. 11, 1389, 1961). Although most orthoferrites showed a nearly linear variation of log ρ (ρ -- resistivity against 1/T, some samples ($NdFeO_3$, $YbFeO_3$, $LaAl_{0.2}Fe_{0.8}O_3$) showed maxima and kinks on the curves. A brief analysis shows that these anomalies are not due to magnetic transformation but to changes in the carrier mobility, although further experimental data are necessary for a reliable interpretation of the results. 'The authors thank M. A. Zaytseva for obtaining the polycrystalline samples and for a discussion of the measurement results.' Original article has: 3 figures.

ASSOCIATION: Kafedra obshchey fiziki dlya biologov Moskovskogo gosudarstvennogo universiteta (Department of General Physics for Biologists, Moscow State University)

SUBMITTED: 25Jun64 ENCL: 00 SUB CODE: EM, SS

NR REF SOV: 006 OTHER: 003

Card 2/2

L 10174-66 EWT(d)/EWT(l)/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JG

ACC NR: AP5026400 SOURCE CODE: UR/0386/65/002/006/0253/0256

AUTHOR: Belov, K. P.; Kadomtseva, A. M.; Ledneva, T. M.; Ovchinnikova, T. L.; Timofeyeva, V. A.

ORG: Physics Faculty of the Moscow State University im. M. Lomonosov (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Features of the temperature dependence of the magnetization of thulium orthoferrite

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 6, 253-256

TOPIC TAGS: thulium compound, temperature dependence, magnetization, magnetic moment

ABSTRACT: The authors observed an anomalous temperature dependence in the magnetization of thulium orthoferrite. When the temperature was reduced to 90K the magnetic moment was reoriented from the c axis to the a axis of the crystal. Below 90K, the spontaneous magnetic moment of the single-crystal thulium orthoferrite remained rigidly oriented along the a axis of the rhombic crystal. By plotting the rotary moments in the (001) plane of the single-crystal thulium orthoferrite at temperatures 78 to 4.2K, the authors obtain, from the rotary moment $\varphi = 90°$, the values of the magnetization at different temperatures. The temperature dependence thus obtained for the magnetization is shown in Fig. 1. At 92K the spontaneous magnetization along the a axis is zero for at this temperature the magnetic moment is still oriented along the c axis of the crystal. After a slight decrease in the temperature (~2°),

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ACC NR: AP5026400

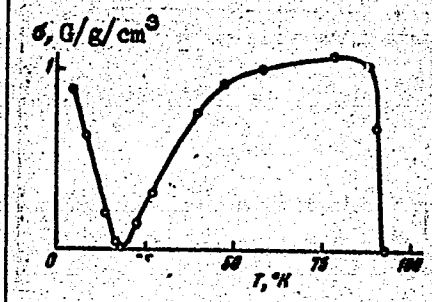

Fig. 1. Temperature dependence of the spontaneous magnetization of single-crystal thulium orthoferrite along the a axis.

the magnetization along the a axis increases rapidly, reaching a value 1 G/g/cm³, owing to the reorientation of the magnetic moment from the c axis to the a axis. With further drop in temperature, the magnetization decreases smoothly, vanishing at 18K. Below 18K, the spontaneous magnetization along the a axis again begins to increase. The vanishing of the spontaneous magnetization is obviously the result of compensation of the magnetic moments of the iron and thulium ions, which should be observed if the exchange interaction between these ions is negative. An analogous phenomenon was apparently observed by the authors earlier for samarium orthoferrite at 4.2K (FMM v. 19, 778, 1965), but it was difficult to present an unambiguous explanation of the phenomenon observed there, since no measurements were made below the compensation point. It follows from the measurements that the magnetic-compensation points observed for the majority of rare-earth ferrites with garnet structure are also possessed by some orthoferrites of rare-earth elements. Orig. art. has: 2 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 08Jul65/ ORIG REF: 002/ OTH REF: 002

Card 2/2

BELOV, K.P.; LYUBUTIN, I.S.

Magnetic properties of substituted ferrites-garnets of gadolinium and yttrium. Kristallografiia 10 no.3:351-356 My-Je '65.
(MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

L 13905-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) LIP(c) GG/JD

ACC NR: AP6003168 SOURCE CODE: UR/0030/65/000/012/0092/0093

AUTHOR: Belov, K. P. (Professor)

ORG: none

TITLE: Problems of physics of ferro- and antiferromagnetism (Conference in Sverdlovsk)

SOURCE: AN SSSR. Vestnik, no. 12, 1965, 92-93

TOPIC TAGS: magnetism conference, solid state physics conference, ferromagnetism, antiferromagnetism

ABSTRACT: At a conference held on July 2-7, 1965 in Sverdlovsk, experts from Sverdlovsk, Moscow, Leningrad, Kharkov, Krasnoyarsk, Yerevan, Ufa, and other cities discussed experimental and theoretical studies of the ferro- and antiferromagnetic properties of metals, alloys, ferrites, and thin films. A number of papers dealt with the theory of the so-called indirect interaction in metallic ferromagnetics. In contrast to past years, a considerable number of neutron diffraction studies of magnetic substances was presented. Another important problem under discussion involved associated magnetoelastic waves and the spin-phonon interaction in lattices of crystalline ferro- and antiferromagnetics. For

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ACC NR: AP6003168

the first time at such a conference, large numbers of papers dealing with internal effective magnetic fields on nuclei of ions which enter into various magnetic materials (ferrites, rare earth ferromagnetics, etc.) was presented. This group also included theoretical studies of associated oscillations of nuclear and electronic spin systems in ferro- and antiferromagnetics. Many reports described experimental investigations of magnetic, resonance, magnetostrictive, electric, and other properties of ferrites having spinel, garnet, perovskite, and hexagonal structures. Other topics discussed were domain structure, magnetic anisotropy, and pulsed alternating magnetization of thin magnetic films.

SUB CODE: 20/ SUBM DATE: none

TS

Card 2/2

BELOV, K.P.; KAKOMTSEVA, A.M.; OVCHINNIKOVA, T.L.

Electric properties of certain orthoferrites of rare earth elements. Vest.Mosk. un. Ser. 3: Fiz., astron. 20 no.2:92-94 Mr-Ap '65. (MIRA 18:5)

1. Kafedra obshchey fiziki dlya biologov Moskovskogo universiteta.

BELOV, K.P., prof.

Colloquium on ferromagnetism held in Poland. Vest. AN SSSR 35 no.4:83 Ap '65. (MIRA 18:6)

BELOV, K.P.; LYUBUTIN, I.S.

Mossbauer effect on Sn^{119} nuclei injected into the lattice of yttrium ferrite garnet. Pis'. v red. Zhur. eksper. i teor. fiz. 1 no.1:26-31 Ap '65. (MIRA 18:9)

1. Institut kristallografii AN SSSR.

BELOV, K.P.; YERGIN, Yu.V.; KATSNEL'SON, A.A.; PED'KO, A.V.

Magnetic properties of gadolinium under high pressure at elevated temperatures. Pis'. v red. Zhur. eksper. i teoret. fiz. 1 no.2: 8-14 Ap '65. (MIRA 18:10)

1. Moskovskiy gosudarstvennyy universitet.

L 9411-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/GG

ACC NR: AP5024692 SOURCE CODE: UR/0056/65/049/003/0747/0750

44,55 44,55 44,55

AUTHOR: Belov, K. P.; Lyubutin, I. S.

ORG: Institute of Crystallography of the Academy of Sciences SSSR (Institut Kristallografii Akademii nauk SSSR)

TITLE: Effective magnetic fields at tin 119 nuclei in substituted iron garnets Ca $Ca_xY_{3-x}Sn_xFe_{5-x}O_{12}$

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 747-750

21,41,55 21,44,55

TOPIC TAGS: tin, yttrium compound, garnet, ferrite, Mossbauer effect, crystal lattice structure, electron interaction

ABSTRACT: This is a continuation of earlier work by the authors (ZhETF, Pis'ma v redaktsiyu, v. 1, no. 1, 26, 1965), in which it was discovered that the nuclei of nonmagnetic tin located in an iron garnet are acted upon by a strong internal effective magnetic field (211 koe), attributed to polarization of the electron core of the tin atoms by the exchange fields of the iron-atom 3d-electrons. The present study dealt with the Mossbauer effect of Sn^{119} introduced into the lattice of substituted yttrium iron garnets, to check on the relation between the effective field at the tin nuclei and the magnetic moment of the sublattice. The experimental conditions were the same as in the earlier investigation. It was found that the nuclei of tin ions located in the octahedral ferrite sublattice are acted upon by an effective field whose magnitude

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L 9411-66
ACC NR: AP5024692 3

is related to the tin concentration (x). At low values of x ($\lesssim$0.7) the effective field was due to simultaneous action of a-a and a-d exchange interactions, but at larger values ($x \gtrsim 0.7$) the effective field was due mainly to the a-d interaction. Authors thank Professor L. M. Belyayev for continuous interest in the work. Orig. art. has: 2 figures and 1 table. 44,55

SUB CODE: 20/ SUBM DATE: 06Apr65/ ORIG REF: 003/ OTH REF: 002

Card 2/2

BELOV, K.P.; KADOMTSEVA, A.M.; LEDNEVA, T.M.; OVCHINNIKOVA, T.L.; TIMOFEYEVA, V.A.

Characteristics of the temperature dependence of the magnetization of thulium orthoferrite. Pis'. v red. Zhur. eksper. i teor.fiz. 2 no.6:253-259 S '65. (MIRA 18:12)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova. Submitted July 8, 1965.

L 23166-66 EWT(m)/EWP(t) IJP(c) JD/JG

ACC NR: AP6002712 SOURCE CODE: UR/0056/65/049/006/1733/1740

AUTHOR: Belov, K. P.; Levitin, R. Z.; Ponomarev, B. K.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Magnetostriction of rare-earth metals in the paramagnetic, antiferromagnetic, and ferromagnetic ranges

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, 1733-1740

TOPIC TAGS: rare earth metal, terbium, dysprosium, holmium, erbium, magnetostriction, paramagnetism, antiferromagnetism, ferromagnetism, pulsed magnetic field

ABSTRACT: The magnetostriction of polycrystalline Tb, Dy, Ho, and Er was measured in pulsed magnetic fields up to 150 koe in the temperature interval 90 to 300K. In earlier investigations the saturation magnetostriction was measured only in individual easy directions. In this investigation, the magnetostriction was also measured below the magnetic-ordering temperature. The measurement was by means of a remote piezoelectric sensor, which will be described elsewhere. The temperature was maintained constant within ±0.3K, and the temperature gradient along the sample did not exceed 2K. The relative strain was measured with accuracy 3 to 5% and its

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L 23166-65

ACC NR: AI6002712

absolute value with accuracy 10 to 12%. A large magnetostriction (of the order of 100 x 10^{-6}) was observed in all metals in the paramagnetic region. In Ho, magnetostriction due to the transition from the antiferromagnetic to the ferromagnetic state was observed. In the ferromagnetic state, the magnetostriction of Tb and Dy reaches values of 3300 x 10^{-6} and 2200 x 10^{-6}, respectively. In Tb and Dy the magnetostriction was measured only in fields above the critical value for the transition from the helicoidal to the ferromagnetic state (0.2 and 10 koe for Tb and Dy). The magnetostriction of all three metals was positive, in contrast with the case of Er, where it was negative. Orig. art. has: 9 figures and 10 formulas.

SUB CODE: 20/ SUBM DATE: 15Jul65/ ORIG REF: 007/ OTH REF: 008

Card 2/2 UDC

L 21804-66 EWT(m)/EWP(t) IJP(c) JD/JG
ACC NR: AP6012189 SOURCE CODE: UR/0386/66/003/008/0329/0333

AUTHOR: Belov, K. P.; Kiryukhin, V. P.; Sokolov, V. I. 43

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvenny universitet) 27

TITLE: Effect of small terbium impurities on the magnetostriction of yttrium iron garnet

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 8, 1966, 329-333

TOPIC TAGS: ~~terbium~~, yttrium compound, garnet, magnetostriction, temperature dependence, saturation magnetization, terbium, polycrystal

ABSTRACT: The authors have measured the saturation magnetostriction of a polycrystalline yttrium iron garnet (YIG) sample made from the purest yttrium oxide at room temperature and found it to be negative and equal to -2.16×10^{-6}, in good agreement with the published data. A plot of the longitudinal saturation magnetostriction of YIG at room temperature vs. the degree of purity of the initial yttrium oxide shows that the negative magnetostriction of YIG decreases rapidly with decreasing purity of the initial yttrium oxide. A check was made on the hypothesis that the greatest effect on the magnitude of the YIG magnetostriction is exerted

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by a terbium impurity, which follows from the fact that terbium iron garnet has at room temperature a positive magnetostriction according to their earlier measurements (ZhETF v. 48, 979, 1965) and hence increases sharply with decreasing temperature. Plots of the temperature dependences of the magnetostriction and saturation magnetization for two YIG samples of different degree of purity (99.940% and 99.996%) show that the magnetostriction becomes positive with decreasing temperature, and that the positive component of the magnetostriction exerts the greatest influence at low temperatures. Even the most insignificant terbium impurities cause not only a decrease in the magnetostriction at 300K, but also a reversal of the sign of the magnetostriction in the region of helium temperatures. On the other hand, no anomalies were observed on the temperature dependence obtained for the saturation magnetization of the same samples. This absence of correlation between the magnetization and magnetostriction of yttrium iron garnet containing a rare-earth impurity is apparently due to the fact that at low temperatures the decisive role is played by the magnetoelastic energy, causing the change in the coupling between the orbital momentum of the rare-earth ion and the intracrystalline field of the iron garnet. The detailed character of this mechanism is still unclear. It is concluded that the temperature dependence of the magnetostriction constant of YIG can serve as a qualitative indicator of the degree of purity of the

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ACC NR: AP6012189

investigated sample (or of the oxide from which it is made), the sensitivity of the magnetostriction to the terbium impurity being apparently much higher than that of the existing methods for spectral analysis of rare-earth oxides. Spectral analysis (sensitivity 0.002%) showed no terbium-oxide impurities of the purest yttrium oxide (99.996%) from which one of the samples was made, yet their presence is clearly disclosed by the anomalous variation of the temperature dependence of the YIG saturation magnetization. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 03Mar66/ ORIG REF: 001/ OTH REF: 004

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L 04419-67 EWT(l)/EWT(m)/T/EWP(t)/ETI LJP(c) JD

ACC NR: AP6034269 SOURCE CODE: UR/0386/66/004/007/0252/0255

AUTHOR: Belov, K. P.; Kadomtseva, A. M.; Ovchinnikova, T. L.; Uskov, V. V. 41 58 B

ORG: Physics Department of the Moscow State University im. M. V. Lomonosov (Fizicheski fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Magnetostriction of thulium orthoferrite single crystals in the region of the temperature of reorientation of the "weak" ferromagnetic moment

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 7, 1966, 252-255

TOPIC TAGS: thulium compound, ferrite, magnetostriction, magnetic moment, temperature dependence

ABSTRACT: This is a continuation of earlier work (Pis'ma ZhETF v. 2, 253, 1965). To verify the occurrence of magnetostriction deformations in thulium orthoferrite single crystals following superposition of a sufficiently strong field, the authors measured the magnetostriction by means of strain gauges near the reorientation temperatures, in fields up to ~13 kOe. The results show that when the field is applied along the c axis, which is the antiferromagnetism axis below the transition temperature, positive magnetostriction of appreciable magnitude occurs in the interval from 93 to 67K. In fields up to 13 kOe the magnetostriction first increases with increasing departure from the reorientation temperature, reaching a maximum at 78K ($\Delta l/l \sim 20 \times 10^{-6}$), and then decreases. Above the transition temperature, magnetostriction is observed only

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ACC NR: AP6034269 3

when the field is directed along the a axis, which is the antiferromagnetism axis at these temperatures. The magnetostriction deformation produced along the c axis was also measured with the field applied along the a axis of the crystal in the temperature interval from 90 to 114K. The sign of the magnetostriction was different for fields applied along the c and a axes of the crystal, and the magnetosctriction decreased at temperatures above 100K. The results are connected with the fact that the threshold fields increase noticeably with increasing departure from the reorientation temperature, and exceed the fields in which the measurements were made. The relatively low threshold fields (~10 kOe) in the temperature interval ~70 - 100K are connected with the fact that the spontaneous magnetic moment can be readily rotated by the field from the c axis to the a axis of the crystal, owing to the low values of the anisotropy constant. When a magnetic field is applied along the b axis of the crystal, no magnetostriction is observed in the entire investigated temperature range, since the b axis is perpendicualr to the plane containing the antiferromagnetism vector, and consequently the field cannot cause flipping of the iron sublattices and lead to magnetostriction deformation in the crystal. It is noted that it is easy to determine the threshold field from the magnetostriction vs. field curves. This is particularly important for thulium orthoferrite, where it is impossible to determine the threshold field from the jump in the magnetization curves during the instant of flipping of the antiferromagnetic sublattices. The authors thank V. A. Timofeyeva for supplying the single-crystal thulium orthoferrite. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 02Jul66/ ORIG REF: 002/ OTH REF: 007

awm
Card 2/2

L 21234-66 EWT(1) IJP(c)
ACC NR: AP6003790 SOURCE CODE: UR/0181/66/008/001/0220/0222

AUTHORS: Belov, K. P.; Koroleva, L. I.

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

TITLE: Anisotropy of the galvanomagnetic effect of the paraprocess in hexagonal ferrites

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 220-222

TOPIC TAGS: galvanomagnetic effect, ferrite, electric resistance, magnetoresistance, temperature dependence, anisotropic medium

ABSTRACT: The authors investigated the galvanomagnetic effect in an oriented polycrystalline ferrite $SrO \cdot 4.4Fe_2O_3 \cdot 1.6Cr_2O_3$ produced by the usual ceramic technology and annealed in a magnetic field. The sample was in the form of a cube with 8.4 mm edge and had a density 4.27 g/cm^3. The electric resistivity was measured by a bridge method. The magnetic field was an electromagnet producing a field up to

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15000 Oe. Measurements were made of the temperature dependence of the longitudinal and transverse even galvanomagnetic effects along the easy magnetization axis (c-axis) and perpendicular to it (basal plane). The resistivity along the c axis was approximately 7 times larger than in the basal plane. This agrees with the results obtained by K. Zaveta (Phys. Stat. Sol. v. 3, 11, 1963) for hexagonal single-crystal $BaFe_{12}O_{19}$ and $PbFe_{12}O_{19}$ ferrites. The logarithm of the resistance increased linearly with the reciprocal of the temperature for both directions. The plot of the temperature dependence of the longitudinal galvanomagnetic effect of the paraprocess shows that the slope of the plot is approximately double in the easy-magnetization direction than in the direction perpendicular to it. The results indicate that the galvanomagnetic effect accompanying the paraprocess is anisotropic in a hexagonal ferrite. The authors thank S. A. Medvedev and A. M. Balbashov for preparing the sample. Orig. art. has: 4 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 15Mar65/ ORIG REF: 004/ OTH REF: 002

L 29970-66 EWT(1) IJP(c)

ACC NR: AP6012488 SOURCE CODE: UR/0181/66/008/004/1217/1220

AUTHORS: Belov, K. P.; Svirina, Ye, P. 53 52 B

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

TITLE: Temperature dependence of the spontaneous Hall constant in ferromagnets

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1217-1220

TOPIC TAGS: ferromagnetic material, Hall constant, temperature dependence, Curie point, paramagnetic susceptibility

ABSTRACT: The authors claim that the experimental results on the temperature dependence of the ferromagnetic Hall constant, which called for this constant to have a maximum at the Curie point, are incorrect, owing to improper methods of calculating the ferromagnetic constant, and that an analysis of their own experimental results shows that there should be no such maximum. To prove their statement, the authors analyze their earlier experimental data (ZhETF v. 37, 1212, 1959) on the Hall effect in Fe_3Pt. It is shown in particular that at the Curie point the Hall coefficient goes over monotonically into the paramagnetic Hall constant,

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ACC NR: AP6012488

and the reason for the maximum observed by others is the fact that they neglected the contribution of the classical part of the Hall field. The results are further confirmed by means of a plot of the susceptibility of the Hall emf against the magnetization susceptibility for different temperatures above the Curie point. The authors thank Yu. P. Irkhin for taking part in a discussion of the experimental results. Orig. art. has: 3 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 14Jul65/ ORIG REF: 007/ OTH REF: 005

Card 2/2 CC

L 07100-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6029112 SOURCE CODE: UR/0048/66/030/006/0975/0978

AUTHOR: Belov, K.P.; Yergin, Yu.V.

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

TITLE: Concerning the magnetic structure of gadolinium [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, 975-978

TOPIC TAGS: ferromagnetism, antiferromagnetism, rare earth, electric resistance, temperature dependence, gadolinium, MAGNETIC STRUCTURE

ABSTRACT: The temperature and magnetic field dependence of the electrical resistivity of gadolinium crystals has been compared with the corresponding dependences in terbium and dysprosium in order to determine whether gadolinium has a noncollinear magnetic structure at temperatures slightly below the Curie point similar to that detected in terbium, dysprosium, and most rare earth ferromagnets by neutron diffraction experiments (neutron diffraction in the case of gadolinium is difficult to investigate because of the large absorption cross section). The resistivity of gadolinium in the direction of the c axis was found to have a maximum at about 290°K analogous to (but less marked than) the maxima exhibited by the resistivities of terbium and dysprosium at 220°K and 170°K, respectively. The anomalous temperature

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ACC NR: AP6029112

dependence of the resistivity along the c axis disappeared in a sufficiently strong magnetic field (above 0.3, 1.8, and 15 kOe for Tb, Gd, and Dy, respectively). From this behavior of the resistivity and from the temperature dependence of the galvanomagnetic effect and the magnetostriction of gadolinium reported elsewhere by the authors and others (Zh. eksper. i teor fiz., 47, 860 (1964); 49, 414 (1965) it is concluded that gadolinium has a noncollinear atomic magnetic structure at temperatures above about 210°K. In the absence of accurate neutron diffraction data it is not possible to determine whether this complex structure is of the antiferromagnetic or the ferromagnetic type. The authors thank A.V.Ped'ko for discussing the results. Orig. art. has: 3 figures.

SUB CODE: 20 SUBM DATE: 00 ORIG. REF: 005 OTH REF: 006

Card 2/2

L 24375-66 EWT(m)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6010976 SOURCE CODE: UR/0056/66/050/003/0560/0564

AUTHORS: Belov, K. P.; Yergin, Yu. V.

ORG: none

TITLE: Magnetic anisotropy of a terbium single crystal

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 3, 1966, 560-564

TOPIC TAGS: terbium, single crystal, magnetic anisotropy, ferromagnetism, Curie point

ABSTRACT: Inasmuch as direct measurements of the magnetic anisotropy of terbium in the ferromagnetic range is very difficult, in view of the very strong fields required, the authors show that the size of the magnetization curve of the single-crystal terbium taken in the region of the Curie point. The method used for the purpose is the Landau thermodynamic method, which the authors have used previously to estimate the anisotropy of single-crystal gadolinium. The tested terbium

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ACC NR: AP6010976

single crystal contained less than 0.1% impurities and was oriented by the Laue method. The magnetization measurements were made by a null method with a magnetometer of the Domenicali type in fields up to 15,000 Oe. The paramagnetic susceptibility was measured with the same magnetometer in a field of 10,000 Oe. To eliminate the influence of the magnetocaloric effect, the magnetization measurements were made under isothermal conditions. The temperature variation of the magnetic anisotropy near the temperature of the destruction of the magnetic ordering (near 230K) was estimated from the magnetization isotherms taken along the axis of easy and of difficult magnetization. The anisotropy energy value is found to be very large near the Curie point, of the order of 10^{10} erg/cm^3, and depends on the external magnetic field. It is shown that the effective anisotropy field leads to the phenomenon of an 'apparent' lowering of the Curie temperature along the axis of difficult magnetization, by about 30°. This is much higher than previously obtained for gadolinium (1.5°). The authors thank Professor A. S. Borovik-Romanov for discussion of the problem. Orig. art. has: 5 figures and 7 formulas.

SUB CODE: 20/ ORIG REF: 003/ OTH REF: 003

Card 2/2

ACC NR: AP6029136 SOURCE CODE: UR/0048/66/030/006/1073/1075

AUTHOR: Belov, K.P.; Sokolov, V.I.

ORG: Physics Department, Moscow State University im. M.V.Lomonosov (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Low temperature magnetic and magnetostrictive properties of rare earth garnet ferrites [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, 1073-1075

TOPIC TAGS: magnetostriction, magnetic susceptibility, low temperature, rare earth element, ferrite, garnet

ABSTRACT: The authors have measured the paraprocess magnetostriction and susceptibility at temperatures from 4 to 100° K of polycrystalline specimens of Gd, Tb, Dy, Ho, Er, and Yb ferrite garnet, prepared by the usual technique. The magnetostriction measurements were made with the aid of a differential capacitor, with which, it is said, displacements as small as 10^{-7} cm can be measured. A superconducting magnet capable of producing a 28 kOe field uniform within 1% over a 7 cm^3 volume was employed. A considerable paraprocess due to the rare earth sublattice was evinced by all the investigated materials at fields exceeding that required to saturate the iron sublattice. Both the paraprocess susceptibility and the paraprocess magnetostriction of each of the investigated materials except the ytterbium and terbium ferrite garnets showed a low temperature maximum, the maximum being reached by both characteristics of a given

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ACC NR: AM5000489 Monograph UR/

Belov, Konstantin Petrovich; Belyanchikova, Marianna Aleksandrovna; Levitin, Rudol'f Zinov'yevich; Nikitin, Sergey Aleksandrovich

Rare-earth ferromagnets and antiferromagnets (Redkozemel'nyye ferromagnetiki i antiferromagnetiki) Moscow, Izd-vo "Nauka", 1965, 319 p. illus., biblio. 4,000 copies printed.

Series note: Sovremennyye problemy fiziki

TOPIC TAGS: rare earth metal, ferromagnetic material, antiferromagnetic material, ferromagnetism, ferrite, antiferromagnetism

PURPOSE AND COVERAGE: Based on the published Soviet and foreign works of students and engineers, a survey is given of the present state of theoretical and experimental studies of ferromagnetism and antiferromagnetism of rare earth metals, alloys and compounds. Also shown are the results obtained by the author. This book is recommended for scientists working with magnetism and solid physics as well as for physicists, chemists, and engineers in research and application of magnetic materials. It can also be useful to aspirants and students in advanced courses of related specialties.

Card 1/2 UDC: 538.221

ACC NR: AM6008489

TABLE OF CONTENTS (abridged):

SUB CODE: 20, 11 SUBM DATE: 07Dec65/ ORIG REF: 113/ OTH REF: 382/

Card 2/2

ACC NR: AP6037056 SOURCE CODE: UR/0056/66/051/005/1306/1310

AUTHOR: Belov, K. P.; Kadomtseva, A. M.; Levitin, R. Z.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Character of the magnetization curves for a single crystal of samarium orthoferrite near the reorientation temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, V. 51, no. 5, 1966, 1306-1310

TOPIC TAGS: magnetization curve, single crystal growing, samarium, ferrite, reorientation temperature, Curie point, magnetic moment, pulsed magnetic field

ABSTRACT: Magnetization curves of a single crystal of samarium orthoferrite have been measured from room temperature to the Curie point. Reorientation of a magnetic moment in a crystal of samarium orthoferrite from the a axis to the c axis was observed on heating to 210C. In the temperature 150—300C the threshold fields of this compound do not exceed 20 koe and, in the first approximation, increase linearly on removal from the reorientation temperature. The measurements made in pulse magnetic fields showed that the threshold field of samarium orthoferrite is 50—60 koe at room temperature, while for europium and

ACC NR: AP6037056

yitterbium orthoferrites the value of the threshold field exceeds 200 koe. The experimental magnetization curves near the reorientation temperature coincide well with the calculated values. The authors wish to express their appreciation to V. A. Timofeyeva for growing the single crystal orthoferrites. Orig. art. has: 7 figures and 6 formulas. [Authors' abstract] [AM]

SUB CODE: 20/ SUBM DATE: 31May66/ ORIG REF: 005/

Card 2/2

ACC NR: AP7003203 SOURCE CODE: UR/0056/66/051/006/1634/1638

AUTHOR: Belov, K. P.; Levitin, R. Z.; Ponomarev, B. K.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Magnetic and magnetostriction properties of an erbium single crystal in the paramagnetic region

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1634-1638

TOPIC TAGS: erbium, magnetic property, magnetostriction, magnetization, magnetic anisotropy

ABSTRACT: This is a continuation of earlier work (ZhETF v. 49, 1734, 1965), where it was shown that polycrystalline samples of terbium, dysprosium, and holmium have relatively large positive magnetostriction in strong magnetic fields, whereas erbium has a much lower and negative magnetostriction. The present article deals with measurements of the magnetostriction, magnetization, and torque of an erbium single crystal in pulsed magnetic fields up to 150 kOe. The measurements were made by procedures described elsewhere (PTE no. 3, 188, 1966). The magnetization was determined by a ponderomotive method. The torque was measured with a piezoelectric pickup. The results show that in the paramagnetic region (between 90 and 300K), the magnetostriction of erbium is very high and anisotropic. It was positive along the hexagonal axis and negative perpendicular to it. Its value reached 240 x 10^{-6} at 220K in a field of 150 kOe (150° higher than the point of transition to a magnetically ordered

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ACC NR: AP7003203

state). The temperature dependence of the magnetostriction is shown to be due entirely to the temperature dependence of the paramagnetic magnetization. The authors thank Professor Ye. M. Savitskiy, V. F. Terekhov, and V. Ye. Kolesnikov for supplying the erbium single crystal. Orig. art. has: 5 figures.

SUB CODE: 20/ SUBM DATE: 01Jul66/ ORIG REF: 003/ OTH REF: 004

Card 2/2

ACC NR: AP7003204 SOURCE CODE: UR/0056/66/051/006/1639/1642

AUTHOR: Belov, K. P.; Goryaga, A. N.; Shrinivasan, S.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Behavior of the initial susceptibility of the paraprocess in ferromagnets and ferrimagnets near the Curie temperature

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1639-1642

TOPIC TAGS: magnetic susceptibility, second order phase transition, ferrite, Curie point, thermodynamic calculation

ABSTRACT: The purpose of the investigation was to check whether the temperature dependence of the initial susceptibility, as derived from the molecular-field and the thermodynamic theory of second-order phase transitions, holds true for the description of the magnetic susceptibility in ferrimagnets, especially ferrites, near their Curie point. To this end, the magnetic susceptibility of an invar alloy of composition 36 wt.% Ni and 64 wt.% Fe and in ferrites of the system $Ni_{1-x}Zn_xFe_2O_4$ ($x = 0.0 - 0.75$) was measured in the vicinity of the Curie temperature in both weak and strong fields. In addition, the sample was subjected to two different homogenizing heat treatments. The results obtained by the method of thermodynamic coefficients differ greatly from those determined in weak fields. Furthermore, the thermodynamic coefficient results did not depend on the heat treatment, whereas those determined in weak fields were strongly dependent on the heat treatment. This is taken as evidence that

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ACC NR: AP7003204

inhomogeneities of the composition greatly affect the behavior of the magnetization curves in weak fields near the Curie point. It is concluded that the theoretical formula $\chi_0^{-1} = A(T - \theta)^{\gamma}$ can be used to describe the susceptibility for a number of ferrites near the Curie point, with γ having approximately the same value (1.30 - 1.37) as for ordinary ferromagnetis. The values of γ for ferrites and for the invar alloy are presented. Orig. art. has: 1 formula and 2 tables.

SUB CODE: 20/ SUBM DATE: 04Jul66/ ORIG REF: 005/ OTH REF: 012

Card 2/2

BELOV, K. P.

USSR/Engineering Feb 1948
Lighting, Fluorescent
Cars, Railroad

"Fluorescent Lighting in Railroad Transportation," K. P. Belov, Candidate Tech Sci; L. T. Oleynikova, Sci Colleague, 2 pp

"Tekh Zhelez Dorog" No 2

Discusses installation of fluorescent lighting in railroad cars as one method of economizing on electric power. Brief description of operation of gas tubes.

61T41

BELOV, K F

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755.012
.B4

Svetovyye signali na zheleznikh dorogak (Light Signals on Railroads)
Moskva, Transzheldorizdat, 1952.
142p. illus., diagrs., tables.
Bibliographical footnotes.

BELOV, K.P., kandidat tekhnicheskikh nauk.

Recognition of colored light signals. Vest.TSNII MPS no.3:13-18 N '56. (MLRA 10:1)
(Railroads - Signaling)

BELOV, K.P., kand. tekhn. nauk.

Requirements for light signaling under high-speed traffic conditions. Vest. TSNII MPS 17 no.4:44-47 Je '58. (MIRA 11:6)
(Railroads--Signaling)

BELOV, K.P., kand. tekhn. nauk, starshiy nauchnyy sotrudnik

Atomic sources of light and their use in signaling. Avtom. telem. i sviaz' 3 no.8:13-14 Ag '59. (MIRA 13:2)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta Ministerstva putey soobshcheniya.
(Railroads--Signaling)

BELOV, K.P., kand.tekhn.nauk

Atomic light sources. Zhel.dor.transp. 41 no.12:85-87 D '59. (MIRA 13:4)
(Lamps) (Radioisotopes--Industrial applications)

BELOVA, L.T., kand.tekhn.nauk; BELOV, K.P., kand.tekhn.nauk

New lighting systems for railroads. Zhel.dor.transp. 43 no.3:45-48 Mr '61. (MIRA 14:3)
(Railroads—Electric equipment)

L 44728-66 EWT(l)/EWP(e)/EWP(t)/ETI/EWT(m) IJP(c) JD/JG/WH

ACC NR: AP6031989 SOURCE CODE: UR/0386/66/004/005/0186/0188

AUTHOR: Belov, K. P.; Sokolov, V. I.

ORG: Physics Department of the Moscow State University im. M. V. Lomonosov (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Magnetostriction of rare-earth gallate garnets

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 5, 1966, 186-188

TOPIC TAGS: garnet, gallium compound, rare earth metal, magnetostriction, paramagnetism, temperature dependence, magnetic susceptibility, Curie point

ABSTRACT: The authors investigated the magnetostriction of paramagnetic garnets in which all the iron was replaced by diamagnetic gallium. Since iron and gallium garnets have very similar structures the investigation of the gallates was aimed at yielding additional information on the behavior of rare-earth ions in the garnet structure. The magnetic and magnetostriction properties of polycrystalline gallate garnets $R_3Ga_5O_{12}$, where R = Gd, Tb, Ho, and Dy, were measured in the temperature interval 1.7 - 50K. The magnetostriction deformation was measured by the capacitive pickup method, and the samples were magnetized with a superconducting solenoid (magnetic field up to 25 kOe). The tests show that with decreasing temperature the magnetostriction increases abruptly, reaching the appreciable magnitude (for paramagnets) ~60 x 10^{-6}. In gadolinium gallate, the magnetostriction is two orders of magnitude smaller and amounts

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BELOV, K.TS.; BOL'SHOVA, K.M.; YELKINA, T.A.; ZAYTSEVA, M.A.

Magnetic properties of ferrites with a compensation point.
Izv. AN SSSR. Ser. fiz. 22 no.10:1282-1292 O '58.
(MIRA 12:3)

1.Fizicheskiy fakul'tete Moskovskogo gos. universiteta im. M.V. Lomonosova.

(Ferrates--Magnetic properties)

AID Nr. 979-3 29 May

REFLEX KLYSTRON AS A FREQUENCY MULTIPLIER (USSR)

Belov, I. A., and M. V. Kapranov. Radiotekhnika i elektronika, v. 8, no. 4, Apr 1963, 600-611. S/109/63/008/004/008/030

A study is made of a reflex klystron frequency multiplier in which a voltage at the desired multiple frequency is applied between the repeller and the resonator. After the solution of equations for electron motion in the bunching space, the problem of finding harmonics of the convection current by means of double Fourier series is analyzed. In order to apply this method, the ac voltage on the repeller is considered as a signal which modulates the power-supply voltage. Solutions for both the asynchronous and the synchronous modes of the multiplier are given. Observations of klystron modes under various amplitudes of asynchronous outside excitation were made by using several reflex klystrons in

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REFLEX KLYSTRON AS A FREQUENCY [Cont'd] S/109/63/008/004/008/030

the 3- to 10-cm range. The results indicate that asynchronous external excitation suppresses the natural-oscillation modes and excites new modes which appear between them. Forced synchronous oscillations can be generated both coincident with free oscillation modes and between these modes, i. e., in regions where natural oscillations are excluded. Because the suppression of natural oscillations occurs under both synchronous and asynchronous conditions, forced oscillations are possible at regeneration factors both less than and greater than 1. The existence of optimal values of both the outside forcing amplitude and the multiplicity factor, at which the power of forced oscillations is maximum, was noted. It is also shown that the amplitude drop of the multiplied signal, which is due to inaccurate tuning of the resonator, can be partially compensated by a change in the transit angle.

[GS]

L 15178-65 EWT(d)/EWT(l)/EEC(b)-2/EWA(h) Pn-4/Pac-4/Peb/Pi-4/Pj-4 SSD/ESD/
ASD(a)-5/AFWL/RAEM(a)/ESD(c)/RAEM(e)/ESD(gs)/ESD(t)
ACCESSION NR: AP4048268 S/0141/64/007/004/0747/0758

AUTHOR: Belov, L. A.

TITLE: Investigation of a reflex klystron in the presence of repeller current

SOURCE: IVUZ. Radiofizika, v. 7, no. 4, 1964, 747-758

TOPIC TAGS: klystron, electron beam control, microwave oscillator

ABSTRACT: Although the presence of repeller current in a reflex klystron is a decisive factor in many klystron applications, few papers have been devoted to klystron operation in the presence of repeller current. The author consequently considers in the kinematic approximation the operating conditions of a reflex klystron with repeller current for normal klystron operation, although the results are also applicable in devices where the high frequency voltage is applied to the repeller. The analysis is carried out in the one-

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L 15178-65
ACCESSION NR: AP4048268

dimensional kinematic approximation under the assumption that there is no spread in the electron velocities, that the electrodes are planar and the electron projectors are normal to the electrode plane, that space charge can be neglected, and that there is no secondary electron emission. An analysis of the mechanism of current distribution in the klystron between the repeller and the cavity makes it possible to explain the phenomenon of phase focusing in the repeller current. The waveforms of the repeller and cavity pulses can then be plotted. Expressions are obtained for all harmonics of the cavity current in the general case, with allowance for repeller current. A harmonic analysis is made of the repeller current, so that the first and higher harmonics can be estimated from the dc component of this current. In addition, methods of using the repeller circuit for the excitation of harmonics of the voltage in the gap is proposed, and the effects of repeller current on a klystron operating in the oscillator mode are considered. "I thank M. V. Kapranov for valuable advice and interest in the work." Orig.

Card 2/3

L 15178-65
ACCESSION NR: AP4048268

art. has: 6 figures and 17 formulas.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

SUBMITTED: 07May63 ENCL: 00

SUB CODE: EC NR REF SOV: 004 OTHER: 002

Card 3/3

ACC NR: AP6007501 SOURCE CODE: UR/0109/66/011/002/0244/0255

AUTHOR: Belov, L. A.

ORG: none

TITLE: Reflex-klystron SHF amplifier

SOURCE: Radiotekhnika i elektronika, v. 11, no. 2, 1966, 244-255

TOPIC TAGS: SHF amplifier, reflex klystron

ABSTRACT: A regenerative reflex-klystron SHF amplifier is theoretically investigated (also see G. Quate et al., IRE Trans., ED-5, 1958, 7, 173). Formulas are developed which show the effect of the beam current, supply voltages, detuning, and input-signal amplitude upon the output-signal amplitude and phase shift of the amplifier. It is found that the instability of amplifier parameters is proportional to its gain, which means that a higher gain requires a higher supply-source stability (for a specified instability of output parameters). A transient-response characteristic (neglecting the electron delay) of the amplifier is given. The effect of the tube operating point, transit angle, load coupling, etc., upon the noise characteristics of

Card 1/2 UDC: 621.375.029.64:621.385.623.5

ACC NR: AP6007501

the amplifier is clarified. Checking against published experimental results corroborates the theoretical conclusions. Recommendations are offered for selecting the klystron type, supply voltages, load coupling, resonator parameters, etc., to ensure maximum stable gain and minimum noise in a cw or pulsed amplifier. "The author wishes to thank M. V. Kapranov for his valuable advice, and M. V. Blagoveshchenskiy, V. A. Ivanov, G. M. Utkin, and A. V. Khryunov for discussing the manuscript." Orig. art. has: 5 figures and 28 formulas. [03]

SUB CODE: 09 / SUBM DATE: 19Dec64 / ORIG REF: 005 / OTH REF: 006
ATD PRESS: 4222

Card 2/2

BELOV, L.

Improving the fixing of fuel pumps. Avt.transp. 36 no.8:51 Ag '58.
(MIRA 11:9)
(Automobiles--Fuel systems)

L 03620-67 EWT(1)

ACC NR: AP6019012 SOURCE CODE: UR/0106/66/000/006/0044/0052

AUTHOR: Belov, L. A.; Blagoveshchenskiy, M. V.; Ivanov, V. A.; Kapranov, M. V.; Utkin, G. M.; Khryunov, A. V.

22
B

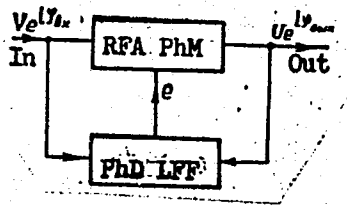
ORG: none

TITLE: Automatic phase control in amplifiers [Reported at the MEI Annual Conference and at the NTORiE Conference, 1964]

SOURCE: Elektrosvyaz', no. 6, 1966, 44-52

TOPIC TAGS: electronic amplifier, rf amplifier, automatic phase control

ABSTRACT: A possibility is discussed of stabilizing the phase of an rf amplifier by means of an automatic-phase-control feedback loop. Phase modulator PhM (see figure) is intended for compensating phase drifts that arise in rf amplifier RFA; these two devices may be designed as a joint unit or as separate units. Phase detector PhD produces an error signal which is due to a deviation of the output-input phase



Card 1/2

UDC: 621.396.6.07

L 03620-67

ACC NR: AP6019012

O

difference from its nominal value. To reduce this error signal to zero, a phase shifter is connected to one of the PhD inputs; this makes a phase-difference reference unit. The error signal between PhD and PhM can be amplified by a d-c amplifier with a l-f filter LFF, which should take into account the inertia of the d-c amplifier and PhD. The error signal e applied to PhM corrects the phase deviation. Stabilizing characteristics of the automatic phase control are studied by setting up and examining its differential equations. The operation of the automatic phase control is illustrated by an example of a simple single-circuit resonant rf amplifier, with a reactance tube playing the role of PhM. The small-disturbance stability of the automatic-phase-control system is investigated for the cases of single-section and two-section RC filters. Orig. art. has: 7 figures and 29 formulas.

SUB CODE: 09 / SUBM DATE: 20Jan65 / ORIG REF: 003

Card 2/2 awm

BELOV, L.F., inzh.

Need for improvement in overhead contact system fixing devices. Elek. i tepl. tiaga 9 no.11:42-44 N '65.

(MIRA 19:1)

L 35907-66 EWT(1)

ACC NR: AP6010787 SOURCE CODE: UR/0106/66/000/002/0023/0030

AUTHOR: Belov, L. A.; Blagoveshchenskiy, M. V.; Ivanov, V. A.; Kapranov, M. V.; Utkin, G. M.; Khryunov, A. V.

31
B

ORG: none

TITLE: Automatic phase control in reflex-type amplifiers

SOURCE: Elektrosvyaz', no. 2, 1966, 23-30

TOPIC TAGS: SHF amplifier, reflex klystron, electronic amplifier

ABSTRACT: An automatic phase control (APC) is suggested for widening the band and stabilizing the operation of reflex-type SHF amplifiers. A phase detector compares the input- and output-signal phases, and the error signal is used to control the phase shift; this can be done, for example, by controlling the repeller voltage. The article theoretically investigates the effect of signal-frequency

Card 1/2 UDC: 621.375.9:621.3.072.7

BELOV, L.M.

COUNTRY : USSR
CATEGORY : Farm Animals. Poultry. Q
ABS. JOUR. : RZhBiol., No. 6, 1959, No. 25930

AUTHOR : Smetnyev, S. I.; Ozerov, A. V.; Shapovalov,*
INST. : -
TITLE : The Raising of Chicks of Native Breeds on Thick Bedding and Dry Fodder.

ORIG. PUB. : Ptitsevodstvo, 1958, No 2, 10-16

ABSTRACT : The results of experiments are presented which are favorable both from the point of view of animal breeding and economics. Also, some factual and critical remarks are given pertaining to the work being done at our IPS and in the field of breeding water birds. -- V. M. Borovskiy

Card: 1/1

*Ya, Ya.; Belov, L. M.; Voskresenskiy, B. A.

BELOV, L. M., Cand of Agric Sci -- (diss) "Improving the Meat Maturity of Moscow Chickens," Moscow, 1959, 16 pp (Moscow Agricultural Academy im Timiryazev) (KL, 5-60, 128)

BELOV, L.M.

Coleophora hemeriobiola Fil. Zashch. rast. ot vred. i bol. 4 no.5:58 S-O '59. (MIRA 16:1)

1. Nachal'nik Tyul'kubasskogo proizvodstvennogo uchastka Yuzhno-Kazakhstanskogo sadovogo otryada.
(Kazakhstan--Casebearers (Insects)--Extermination)

BELOV, L.M., aspirant

Improving the meat quality of broilers of Russian dual-purpose breeds. Ptitsevodstvo 9 no.6:39-43 Je '59.

(MIRA 12:10)

1.Kafedra ptitsevodstva Moskovskoy ordena Lenina sel'skokhozyaystvennoy akademii im. K.A. Timiryazeva.

(Poultry breeding)

VDOVENKO, V.M.; BELOV, L.M.; CHAYKHORSKIY, A.A.

Complex formation in nonaqueous solutions. Radiokhimiia 1 no.4: 439-444 '59. (MIRA 13:1)
(Complex compounds)

BELOV, L.M., otv. red.

[Struggle of the Communist Party for the development of Soviet railroads] Iz istorii bor'by Kommunisticheskoi partii za razvitie sovetskogo zheleznodorozhnogo transporta. Leningrad, 1960. 248 p. (Its Uchenye zapiski kafedry marksizma-leninizma) (MIRA 15:2)

1. Leningrad. Institut inzhenerov zheleznodorozhnogo transporta.

(Railroads)
(Communist Party of the Soviet Union)

S/186/61/003/003/008/018
E071/E435

AUTHORS: Chaykhorskiy, A.A., Vdovenko, V.M., Yefimova, K.I. and Belov, L.M.

TITLE: On the Investigation of the Formation of Complexes in Non-Aqueous Solutions. III. The Determination of Thermodynamic Characteristics of Systems: Water-Tributylphosphate-Benzene and Water-Butylacetate-Benzene

PERIODICAL: Radiokhimiya, 1961, Vol.3, No.3, pp.295-301

TEXT: The mechanism of the distribution of water between aqueous and organic phases in the above systems was investigated previously (Ref.6: V.M.Vdovenko, L.M.Belov, A.A.Chaykhorskiy, Radiokhimiya, 1, 4, 439 (1959); and Ref.7: V.M.Vdovenko, K.I.Yefimova and Chaykhorskiy, Radiokhimiya, 2,6,675 (1960)). It was then found that in aqueous and organic phases of the above system, in the range of concentration of the organic component of up to 10%, molecular compounds of the composition TBPh·H_2O and BA·H_2O (TBPh-tributylphosphate; BA - butylacetate) are formed. On the basis of data on the distribution of water between the phases, the equilibrium constants for the above compounds in the organic phase at 20°C were calculated. In the present paper the

Card 1/3

On the Investigation of ...

S/186/61/003/003/008/018
E071/E435

results of an investigation of the chemical equilibrium in the organic phase of the above system at 6, 13 and 20°C are reported and, on the basis of these data, complete thermodynamic characteristics of the reaction of formation of $TBPh \cdot H_2O$ and $BA \cdot H_2O$ as well as of the process of distribution of water between water and benzene were calculated. The results obtained indicated that the process of formation of complexes TBPh and BA with water are exothermic, the values of enthalpies are practically equal ($\Delta H^\circ = -3.84 \pm 4\%$ and $-3.13 \pm 6\%$ k cal/mole for $TBPh \cdot H_2O$ and $BA \cdot H_2O$ respectively) while the isobar potentials differ by one order (ΔZT - 1.41 ± 2% and 0.0546 ± 3% kcal/mole, respectively) which indicated that the stability of $TBPh \cdot H_2O$ is higher than that of $BA \cdot H_2O$. The process of solution of benzene in water is endothermic ($\Delta H^\circ = 5.19 \pm 6\%$ kcal/mole). The numerical value of the heat of the solution of benzene in water is higher than the heat effect of the reaction of the above complexes. Thus, despite the reaction of formation of complexes being exothermic, the overall process of the solution of water in a benzene solution of TBPh or BA remains endothermic. There are 5 figures, 5 tables and 8 references: 4 Soviet-bloc and 4 non-Soviet-bloc. The four references to

Card 2/3

On the Investigation of ... S/186/61/003/003/008/018
E071/E435

English publications read as follows: E.Gluecauf, H.A.C.McKay and A.R.Mathieson, Trans.Farad.Soc., 47, 5, 437 (1951);
A.W.Gardner and H.A.C.McKay, Trans.Farad.Soc., 48,12,1099 (1952);
H.A.C.McKay, Trans.Farad.Soc., 47,12,1103 (1952);
T.H.Siddell, J.Am.Chem.Soc., 81,16,4176 (1959).

SUBMITTED: May 16, 1960

Card 3/3

BELOV, L.M.; DZHELEPOV, B.S.; IVANOV, R.B.; KRIVOKHATSKIY, A.S.; NEDOVESOV, V.G.; CHECHEV, V.P.

α-Decay of Cm^{245} and Cm^{246}. Radiokhimiia 5 no.3:394-395 '63. (MIRA 16:10)

(Curium isotopes—Decay)

MALKIN, L.Z.; ALKHAZOV, I.D.; KRIVOKHATSKIY, A.S.; PETRZHAK, K.A.; BELOV, L.M.

Energy distribution of spontaneous fission fragments of Cm^{244}. Atom. energ. 15 no.3:249-250 S '63. (MIRA 16:10)

(Curium) (Nuclear fission)

MALKIN, L.Z.; ALKHAZOV, I.D.; KRIVOKHATSKIY, A.S.; PETRZHAK, K.A.; BELOV, L.M.

Spontaneous fission of Cm^{244} with emission of a long-range α-particle. Atom. energ. 16 no.2:148-149 F '64. (MIRA 17:3)

BELOV, L.M., kand.sel'skokhoz.nauk

Industrial breeding of broilers. Inform.biul.VDNKH no.11:20-21 N '64. (MIRA 18:2)

1. Zaveduyushchiy otdel'om broylerov Ukrainskogo nauchno-issledovatel'skogo instituta ptitsevodstva.

BELOV, L.N.; TSELLARIUS, Yu.G.

Causes of selective fluorescence of mucins in acridine-orange stained sections following treatment with iron alum. Izv. SO AN SSSR no.8. Ser.biol.-med.nauk no.2:130-134 '65. (MIRA 18:9)

1. Otdel eksperimental'noy biologii Instituta tsitologii i genetiki Sibirskogo otdeleniya AN SSSR, Novosibirsk.

BELOV, L. N. Cand Tech Sci

Dissertation: "selective Induction Preheating in Welding Process."

26/6/50

Moscow Order of the Labor Red Banner Higher Technical School memi N. E. Bauman

SO Vecheryaya Moskva
Sum 71

BELOV, L.N.

USSR/Engineering - Welding, Processes Dec 51

"Local Induction Preheating During Arc Welding of Steel Plates," L. N. Belov, Cand Tech Sci

"Avtogen Delo" No 12, pp 9-11

Summarizes results of works conducted for several years by Welding Lab of MVTU and Welding Section of Acad Sci USSR in the field of preheating steel plates with currents of industrial frequency. Permissible magnitudes of magnetic induction were found, as result of studying interfering effect of magnetic field on arc. Suggests method for designing flat induction heating coil with iron ore.

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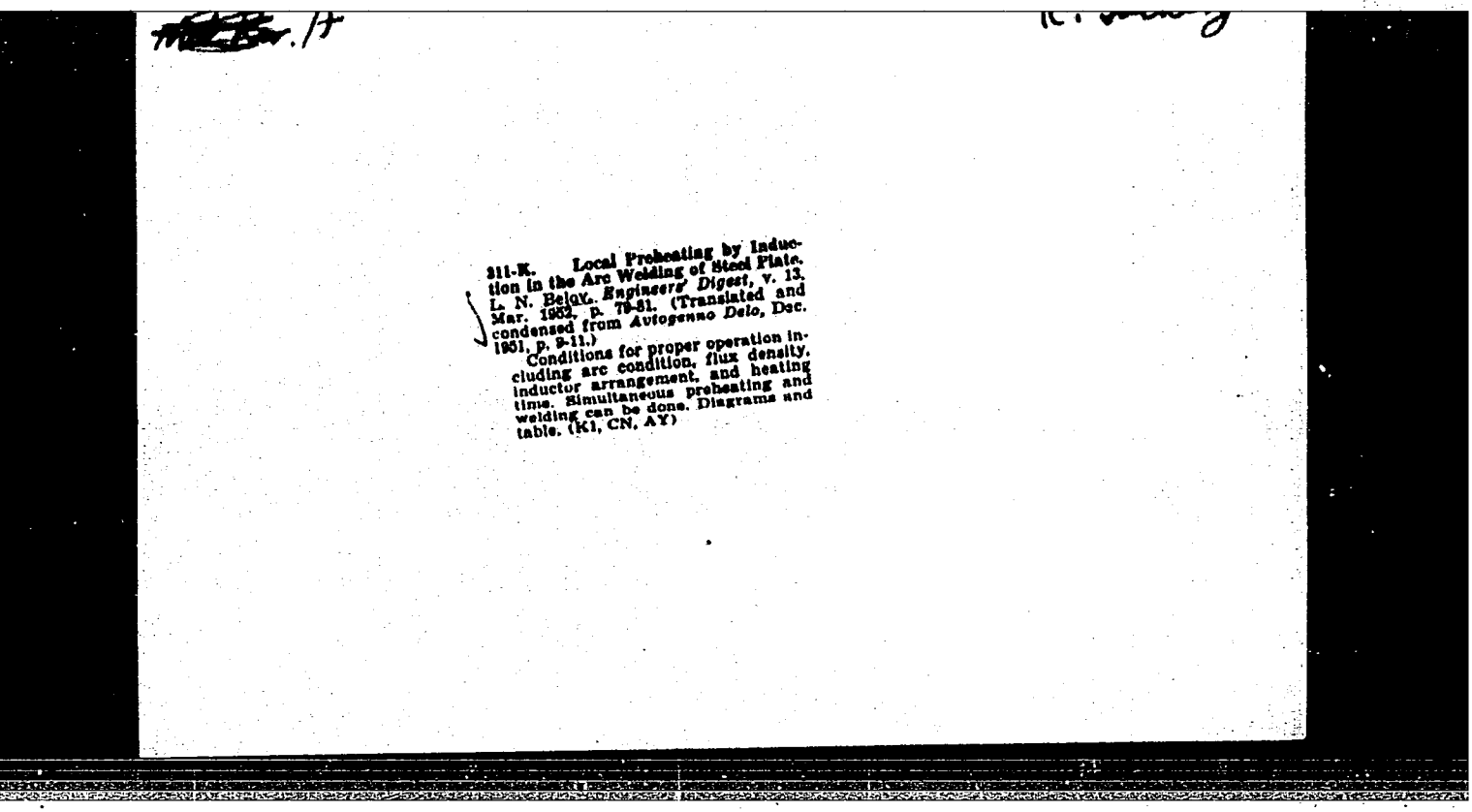

311-K. Local Preheating by Induction in the Arc Welding of Steel Plate. L. N. Belov. *Engineers' Digest*, v. 13, Mar. 1952, p. 79-81. (Translated and condensed from *Avtogennoe Delo*, Dec. 1951, p. 9-11.)

Conditions for proper operation including arc condition, flux density, inductor arrangement, and heating time. Simultaneous preheating and welding can be done. Diagrams and table. (K1, CN, AY)

RYKALIN, I.D.; BELOV, L.N.

Processes of the local heating of steel sheets with flat inducters.
Trudy Sektsii po nauchnoi razrabotke problem elektrosvarki i elektrotermii
Akademii nauk SSSR, no.2:140-163 '53. (MLRA 7:6)
(Welding)

BELOV, L.N.

Comparative microscopy of collagen and reticulin fibers in polarized light. Izv. SO AN SSSR no.4 Ser. biol.-med. nauk no.1:84-86'63. (MIRA 16:8)

1. Institut eksperimental'noy biologii i meditsiny Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(COLLAGEN) (RETICULIN)

ACC NR: AP6021452 (N) SOURCE CODE: UR/0413/66/000/011/0075/0075

INVENTOR: Ustinov, V. V.; Grigor'yeva, N. M.; Grishin, A. A.; Belov, L. V.; Brusilovskiy, A. A.; Sinalayev, O. P.

ORG: None

TITLE: A method for measuring the thickness and rate of application of films. Class 42, No. 182339

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 75

TOPIC TAGS: surface film, resonator, quality control, industrial automation

ABSTRACT: This Author's Certificate introduces a method for using two piezoelectric resonators to measure the thickness and rate of deposition of a film on a base. The procedure is designed for a wide range of thicknesses and for obtaining information in a discrete form which is convenient for automation of the process. The monitored portion of the flow of material being applied to produce the film is switched from one resonator to the other and back again after the required thickness has been reached in the given section. Film thickness is determined from the number of reversals while the rate of application is determined from the reversal frequency.

SUB CODE: 11, 13/ SUBM DATE: 03Apr65

Card 1/1 UDC: 531.7;621.9.08;531.717.1;531.767

DANYUSHEVSKIY, S.I., kand. tekhn. nauk; YEGOROV, G.B., kand. tekhn. nauk; BELOV, L.V., inzh.

Improvement of the system of technological control of cement manufacture. TSement 31 no.2:3-5 Mr-Ap '65. (MIRA 18:8)

1. Gosudarstvennyy vsesoyuznyy institut po proyektirovaniyu i nauchno-issledovatel'skim rabotam tsementnoy promyshlennosti. Leningrad.

BELOV, M.

Collective farm flax dryer; Minsk, Gos, izd-vo BSSR, 1950

1. M. BELOV.

2. USSR (600)

4. Agricultural Machinery

7. Improving the work pattern of the VNIIL-TL-40 flax scutcher. MTS 12 no. 11. 1952.

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

GOLUBEV, Yevgeniy Petrovich; BELOV, M., red.; TREBUKHOV, N., tekhn.red.

[On the Vokhma River; a sketch] Nad Vokhmoi rekoi; ocherk. Kostromskoe knizhnoe izd-vo, 1958. 53 p. (MIRA 12:2)
(Vokhma Valley--Description and travel)

MAYANSKIY, Yevgeniy Ivanovich; BELOV, M., red.; TREBUKHOV, N., tekhn. red.

[Homemade visual aids in solid geometry] Samodel'nye nagliadnye posobiia po stereometrii. Kostroma, Kostromskoe knizhnoe izd-vo, 1959. 81 p. (MIRA 15:4)
(Geometry, Solid) (Visual aids)