ACCESSION NR: AP4005835 S/0226/63/000/006/0011/0017

AUTHOR: Avgustinik, A. I.; Vigdergauz, V. Sh.; Gropyanov, V. M.; Drozdetskaya, G. V.

TITLE: Effect of powder fineness on the density of niobium carbide parts at various sintering temperatures

SOURCE: Poroshkovaya metallurgiya, no. 6, 1963, 11-17

TOPIC TAGS: niobium carbide, sintered niobium carbide, niobium carbide powder, niobium carbide sintering, niobium carbide density, sintering, powder metallurgy, density

ABSTRACT: Niobium carbide sinters poorly due to its high melting point (3750 K), leading to lower microhardness. The present authors therefore studied the relationship between particle size, sintering temperature, density and heat resistance of NbC and attempted to find methods for producing niobium carbide powder with a relative density not lower than 90% of the theoretical value at low sintering temperatures. This is very important for creating heat resistant structures. Pulverization in vibro-mills was used to obtain fine particles of niobium carbide, thus increasing the surface energy prior to cold pressing. Fig. 1 in the Enclosure shows the effect of the sintering temperature on the specific gravity of niobium carbide

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ACCESSION NR: AP4005835

with varying initial specific surface area. This test was performed on the Deryagin device. As seen from the graph in Fig. 2 of the Enclosure, greater dispersion of the powder leads to higher density at lower temperatures. Two formulas are proposed by the authors for relating the sintering temperature and fineness of the carbide powder. Experimental data and the theoretical values obtained from these formulas differed by not over 1-1.5%. Tests performed by the authors also corroborated the phenomenologic theory mentioned in articles by M. S. Koval'chenko, G. V. Samsonov and V. V. Skorokhod. It was found that a relative density of niobium carbide powder of up to 97% can only be obtained with very fine powder and sintering temperatures $\leq$ 0.6 m.p. On the basis of experimental data, the lattice destruction energy for NbC is calculated to be approximately 410 k-J/mol. Orig. art. has: 7 figures, 4 tables and 9 equations.

ASSOCIATION: Leningradskiy Tekhnologcheskiy Institut im. Lensoveta (Leningrad Technological Institute)

SUBMITTED: 19Nov62 DATE ACQ: 20Jan64 ENCL: 02

SUB CODE: MM NO REF SOV: 009 OTHER: 000

2/4
Card

ACCESSION NR: AP4005835

ENCLOSURE: 01

Fig. 1. Density of NbC in relation to the sintering temperature: 1 - 1.56; 2 - 4.1; 3 - 6.2; 4 - 12.5

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ACCESSION NR: AP4005835

ENCLOSURE: 02

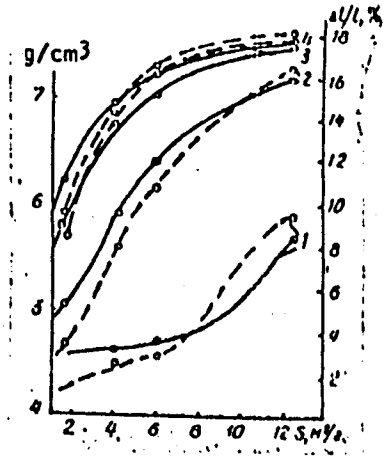

Fig. 2. Density (solid line) and contraction (dash line) of NbC in relation to the specific surface area of the sintered powder. Sintering temperature: 1 - 2240±20K; 2 - 2020±20K; 3 - 1820±20K; 4 - 1590±15K

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L 20498-65 EPF(c)/EPF(n)-2/EPR/EWG(j)/EPA(s)-2/EPA(w)-2/EWT(m)/EWP(b)/T/EWP(c)/EWP(t) Pr-4/Ps-4/Pt-10/Pu-4/Pab-10 ASD(m)-3/AS(mp)-2/IJP(c) AT/WH/WW/JD/JG

ACCESSION NR: AP5001303 S/0131/64/000/012/0570/0575

AUTHOR: Avgustinik, A. I.; Gropyanov, V. M.; Drozdetskaya, G. V.; Vigdergauz, V. Sh.

TITLE: Interaction of certain refractory carbides with zirconium dioxide

SOURCE: Ogneupory, no. 12, 1964, 570-575

TOPIC TAGS: refractory carbide, refractory oxide, zirconium carbide, titanium carbide, zirconium dioxide, high temperature refractory, cermet component, refractory ceramic, niobium carbide

ABSTRACT: Physical, mechanical, and electric properties and the crystal lattice structure of the refractory sintered mixtures of zirconium dioxide with zirconium, titanium, or niobium carbides have been investigated. The investigation follows up a series of publications on interaction between refractory carbides and oxides. The importance of the subject was stressed for high-temperature applications. Compacted samples of the carbide-zirconium dioxide mixtures containing 5—95% of each component were vacuum sintered at 2300—2400C. Pure

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L 20498-65
ACCESSION NR: AP5001103

2

Zirconia, either unstabilized (monoclinic) or stablized by fusion or by the addition of CaO, was used as starting material. Measurements of the physical and mechanical characteristics of the sintered samples and the kinetics of the changes in combined carbon content of the mixtures at various temperatures during the sintering indicated that $ZrC-ZrO_2$ "cermets" are the most stable of the materials investigated at high temperature. X-ray investigation of the lattice parameters showed the effect of ZrO_2 content and form in the samples. Lattice parameters of the carbide component decrease with increasing ZrO_2 concentration; this decrease is most pronounced for the ZrO_2 stabilized by fusion, and least pronounced for the monoclinic ZrO_2. The pattern of the changes in lattice parameters confirmed the stability of the $ZrC-ZrO_2$ and $TiC-ZrO_2$ "cermets" at sufficiently high temperature. Micrographs of the sintered samples produced the evidence of the existence of a third phase which was metallic. The properties of $ZrC-ZrO_2$ and $TiC-ZrO_2$ "cermets" make them potential construction materials for high-temperature use. Orig. art. has: 4 figures and 5 tables.

Card 2/3

L 20498-65
ACCESSION NR: AP5001303

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institute)

SUBMITTED: 00	ENCL: 00	SUB CODE: MT
NO REF SOV: 003	OTHER: 006	ATD PRESS: 3162

Card 3/3

ACCESSION NR: AP4041682 S/0153/64/007/002/0274/0279

AUTHOR: Avgustinik, A. I., Sintsova, I. T.

TITLE: Infra-red spectra and mechanical properties of glasses of the K_2O-SiO_2 system upon partial substitution of K_2O by CaO, MgO and Al_2O_3

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 7, no. 2, 1964, 274-279

TOPIC TAGS: K_2O SiO_2 system, IR spectra, mechanical property, porcelain type glass, SiO_2 K_2O CaO system, SiO_2 K_2O MgO system, SiO_2 K_2O Al_2O_3 system, spectral shift, mechanical strength, modulus of elasticity, microhardness, sound transmission

ABSTRACT: A study of porcelain type glass and experimentation with glass containing 73 wt.% SiO_2 and 26.9 wt.% K_2O showed that partial replacement of the K_2O by CaO and MgO causes a shift of the IR absorption bands (measured in the 700-1200 cm^{-1} region) at 1110 cm^{-1} in the long wave portion of the spectrum. The MgO caused a greater

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ACCESSION NR: AP4041682

shift of the silica absorption band than did the same concentration of CaO. The greatest shift of 100 cm^{-1} was produced by the simultaneous presence of 2.8-6 wt.% of CaO and MgO. Addition of 3.3-8.4 wt.% Al_2O_3 removed the long wave shift in these glasses. The mechanical strength of glass was increased by partially replacing the K_2O by CaO and MgO, CaO giving the stronger glass. The addition of Al_2O_3 gave the strongest glass, the highest values for the modulus of elasticity, microhardness and sound transmission rate. "Graduate L. G. Lazarevich participated in the work." Orig. art. has: 2 tables and 2 figures.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lensovyeta Kafedra tekhnologii keramicheskikh proizvodstv (Leningrad Technological Institute, Department of Ceramic Production Technology)

SUBMITTED: 24Sep63 ENCL: 00

SUB CODE: MT, OP NR REF SOV: 006 OTHER: 003

Card 2/2

AVGUSTINIK, A.I., doktor tekhn.nauk; PYZHOVA, A.F., inzh.

Changes in the structure and properties of glaze with the replacement of feldspar by a mixture of materials of identical composition. Stek. i ker. 21 no.11:19-24 N '64. (MIRA 18:4)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta (for Avgustinik). 2. Gosudarstvennyy issledovatel'skiy keramicheskiy institut (for Pyzhova).

AVGUSTINIK, A.I., prof.

Interaction of oxides and carbides with metals. Zhur.VKHO 10 no.5:512-518 '65.

(MIRA 18:11)

L 18943-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(n)-2/EPR/EWP(t)/EPA(bb)-2/EWP(b) Ps-4/
Pt-10/Pu-4 RJW(c)---AT/WH/JD/JG
ACCESSION NR: AP5000505 S/0080/64/037/011/2375/2382

AUTHOR: Neshpor, V. S.; Ordyn'yan, S. S.; Avgustinuk, A. I.; Khusidman, M. B.

TITLE: The effect of the chemical composition of zirconium and niobium carbides in a homogeneous region on their electrical and thermal properties

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 11, 1964, 2375-2382

TOPIC TAGS: refrectory carbide, zirconium carbide, niobium carbide, nonstoichiometric carbide, transition metal carbide, carbide electrical property, carbide thermal property

ABSTRACT: Electrical resistivity, absolute thermoelectric power, and thermal conductivity at room temperature have been measured in homogeneous, nonstoichiometric zirconium and niobium carbides, ZrC and NbC, with x varying from 0.6—0.7 to 1. Zirconium and niobium carbides were selected for study as representative of the refractory carbides of the group-IV and group-V transition metals, which are used in certain parts (e.g., cathodes) of thermionic converters. The single-phase

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L 18913-65

ACCESSION NR: AP5000505

carbide samples were prepared by compacting and vacuum sintering the powdered mixtures of nearly stoichiometric carbides and corresponding metals. Resistivity was measured by a compensating circuit method; thermal conductivity, by the method of steady heat flow. Thermal emf generated in the sample between two parallel plane semiconductor plates served as a measure of the heat flow. The same equipment was used for measuring thermal conductivity as for measuring the thermoelectric power. Experimental data were tabulated and plotted versus carbon deficit in MeC_x. The data indicated a substantial difference between the $Me^{IV}C_x$ and $Me^{V}C_x$ carbides in the properties which depend on the electronic configuration of the molecule, i.e., the overall resistivity and thermal emf. The difference in the properties is explained in terms of different effective valence of the metals. Similarity between $Me^{IV}C_x$ and $Me^{V}C_x$ carbides was shown in those properties which depend on lattice dynamics, i.e., 1) resistivity component due to the scattering on vacancies in carbon sublattice, which is evidenced in the pattern of composition-dependence of the molecular rigidity, 2) lattice thermal conductivity, and 3) coefficient of thermal expansion. Orig. art. has: 6 figures, 2 tables, and 12 formulas.

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L 18963-65
ACCESSION NR: AP5000505

ASSOCIATION: none

SUBMITTED: 29Jul63 ENCL: 00 SUB CODE: MT

NO REF SOV: 019 OTHER: 012 ATD PRESS: 3158

Card 3/3

L 31876-66 EWI(m)/EIC(f)/EWP(e)/EWP(w)/T/EWP(t)/ETI IJP(c) AT/WH/GD/MW/JD/JG
ACC NR: AT6013559 (A) SOURCE CODE: UR/0000/65/000/000/0211/0218

AUTHOR: Vil'k, Yu. N.; Ordan'yan, S. S.; Avarbe, R. G.; Avgustinnik, A. I.; Ryzhkova, T. P.; Omel'chenko, Yu. A.

47
46
B+1

ORG: State "Order of the Red Banner of Labor" Institute of Applied Chemistry (Gosudarstvennyy ordena Trudogo Krasnogo Znamenii institut prokladnoy khimii)

TITLE: Phase diagram of the Zr-ZrC system

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova, dumka, 1965, 211-218

TOPIC TAGS: zirconium, carbide, nonferrous metal, phase diagram, phase composition

ABSTRACT: The phase diagram of the Zr-ZrC system was drawn up on the basis of experimentally determined melting points, x-ray, and microhardness data for samples containing 1.25-46.25 atm % C. The work was conducted in order to resolve a controversy in the literature. The phase diagram was examined in the 600°-3100°C range. The samples were prepared by fusing zinc hydride with carbon in various ratios and holding for 4 hrs at 1400°C in argon atmosphere. The phase diagram of the Zr-ZrC system is shown in figure 1. The eutectic temperature of the system is 1820°C. The eutectic alloy contains 3.0 atm % C. The changes of the ZrC-phase lattice parameter as a function of

Card 1/2

AVGUST[illegible], BOZIEVSKIY, L.V.

[illegible] the synthesis of pure titanium carbide by the metal-[illegible] method. Izv. AN SSSR. Neorg. mat. 1 no.6:830-834 Je '65. (MIRA 18:8)

1. Leningradskiy khimiko-tekhnologicheskiy institut imeni Lensoveta.

ACC NR: AP5022743 EWP(k)/EWP(z)/EWP(b) IJP(c) JD

SOURCE CODE: UR/0181/65/007/009/2860/2862

AUTHOR: Golikova, O. A.; Avgustinnik, A. I.; Klimashin, G. M.; Kozlovskiy, L. V.

ORG: Institute of Semiconductors AN SSSR (Institut poluprovodnikov AN SSSR); Leningrad Technological Institute im. Lensovet (Leningradskiy tekhnologicheskiy institut)

TITLE: Electrical properties of titanium carbide

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2860-2862

TOPIC TAGS: electric property, titanium compound, carbide, energy band structure, thermoelectromotive force, Fermi level

ABSTRACT: The authors study the electrical properties of titanium carbide as a function of carbon concentration. The data are used as a basis for an explanation of the energy spectrum and mechanism responsible for scattering of current carriers. The resistivity, thermoelectromotive force and Hall constant were measured in specimens of TiC_x (x = 0.43-1.0). Powder metallurgy methods were used for producing the specimens. Curves are given for resistivity and thermoelectromotive force as functions of temperature in the 300-1,500°K range for various values of x. Hall concentrations, defect concentrations, mobilities and effective masses are tabulated for various carbon concentrations. It was found that the effective mass decreases with an increase

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ACC NR: AP5022743

in concentration. It is assumed that the Ti-C bond is basic in stoichiometric TiC and that the Ti-Ti bond is strongly screened. The Ti-Ti bond becomes more and more important as the carbon content in the compound is increased. The stronger this bond becomes, the wider the conduction band and the greater the deviation from semiconductor properties. The rapid increase in thermoelectromotive force at high temperatures is explained by assuming that the "metal" conduction band overlaps the higher conduction band of stoichiometric titanium carbide. At high temperatures, the Fermi level falls into the higher band and thermoelectromotive force begins to increase more rapidly. This hypothesis is confirmed by $\alpha(T)$ curves. Orig. art. has: 2 figures, 1 table.

SUB CODE: 20/ SUBM DATE: 14Apr65/ ORIG REF: 003/ OTH REF: 002

Card 2/2 pw

L 52311-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EWG(m)/EPR/EPA(w)-2/T/EWP(t)/EWP(b) Pab-10/Pr-4/Ps-4/Pt-7/Pu-4 IJP(c) JD/WW/JG/WH

ACCESSION NR: AP5008814 S/0080/65/038/003/0665/0667

AUTHOR: Avgustinik, A. I.; Vigdergauz, V. S.; Kalinina, N. G.; Ordan'yan, S. S.

TITLE: Interaction between boron nitride and chromium 65 B

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 3, 1965, 665-667

TOPIC TAGS: boron nitride, chromium, metallic regulus, chromium boride, cermet, chromium cermet

ABSTRACT: Products of interaction of boron nitride with chromium were examined by emission- and X-ray spectroscopy. Samples of chromium containing cermets coated with boron nitride were heated in an argon atmosphere at a rate of 500°C per hour up to 1,650°C, and held at 1,650°C for 5 minutes. After this treatment the metallic reguli 0.8 to 2 mm in diameter were detected on the cermet surface. Two phases are present: an anisotropic phase with a microhardness of 2,443 kg/cm^2 and an isotropic phase with a microhardness of 284 kg/cm^2. Independently prepared samples of chromium boride according to reaction $2BN + 4Cr \rightarrow 2Cr_2B + N_2\uparrow$ have a microhardness of 2,425 kg/cm^2. The weight per cent ratio of boron to chromium in the

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L 52311-65

ACCESSION NR: AP5008814

anisotropic phase is 10 which agrees with the composition of Cr_2B (ratio 10.4). In the isotropic phase no boron is present according to emission spectroscopic analysis. At 1,650°C chromium decomposes boron nitride with resultant formation of chromium boride. Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 28Feb63 ENCL: 00 SUB CODE: MM, IC

NO REF SOV: 004 OTHER: 001

LL

Card 2/2

L 63049-65 EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) Pu-4 IJP(c) JD/WW
ACCESSION NR: AP5017778 UR/0080/65/038/007/1500/1506
546.831+546.831'261+669.018.1

30
B

AUTHOR: Vil'k, Yu. N.; Chdan'yan, S. S.; Avarbe, R. G.; Avgustinik, A. I.; Ryzhkova, T. P.; Omel'chenko, Yu. A.

TITLE: Phase diagram in the Zr-ZrC system

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 7, 1965, 1500-1506

TOPIC TAGS: zirconium, zirconium carbide, phase diagram, alloy hardness

ABSTRACT: A phase diagram (see Fig. 1 of the Enclosure) plotted on the basis of measurements of melting points and data of x-ray structural and metallographic studies in the Zr-ZrC system (in the range of 1.25 to 46.25 at. % C) was found to be eutectic in character. The temperature of the eutectic is 1820C, and the eutectic composition contains 3.0 at. % carbon. The solubility of the latter is about 2 at. % at the temperature of the eutectic transformation. The region of homogeneity of the ZrC phase at the temperature of the eutectic and at 1250C is bounded by 35 and 39 at. % C, respectively. The lattice constant of alloys located in the two-phase region after soaking at 1400C is equal to 4.653 kX; the

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L 63049-65

ACCESSION NR: AP5017778

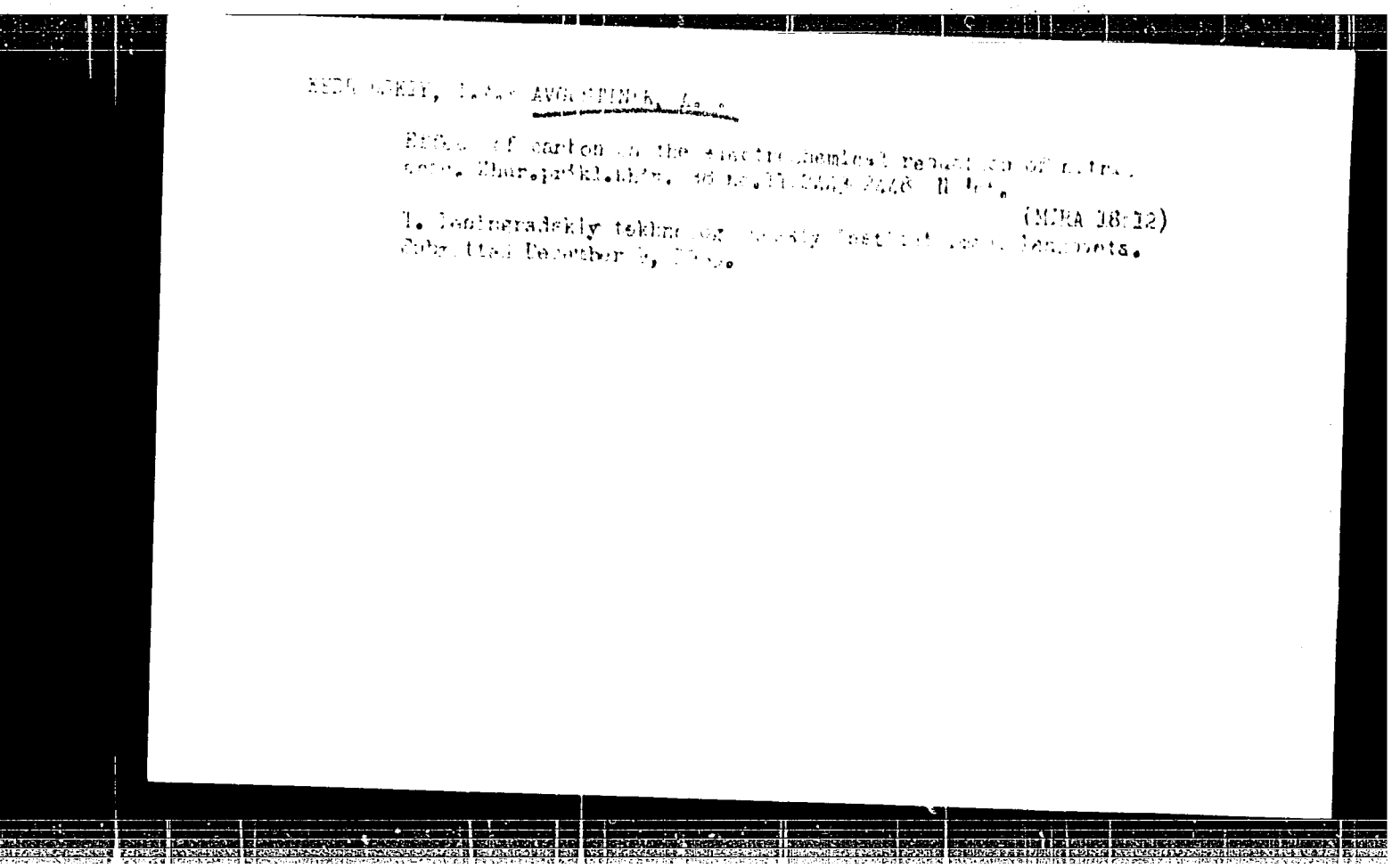
extrapolated value of the lattice constant at the upper boundary of the region of homogeneity is equal to 4.688. The microhardness of alloys in the region of homogeneity of the ZrC phase and in the two-phase region is given. In accordance with a hypothesis advanced earlier, the microhardness of alloys may be extrapolated in a straight line to the value of microhardness for pure zirconium at zero carbon content. The solidus line extrapolated to the melting point of zirconium carbide reaches a point between 3975 and 3500C, which also agrees with the data on the melting point of ZrC. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 23Sep63 ENCL: 01 SUB CODE: IC, MM

NO REF SOV: 006 OTHER: 008

Card 2/3



L 20321-66 EWT(m)/EWP(t) IJP(c) JD

ACCESSION NR: AP5018912 UR/0363/65/001/006/0830/0834

546.821'261

12
11
B

AUTHOR: Avgustinik, A. I.; Klimashin, G. M.; Kozlovskiy, L. V.

TITLE: Investigation of conditions of synthesizing pure titanium carbide by sintering

27 27

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 6, 1965, 830-834

TOPIC TAGS: carbide, titanium carbide, titanium carbide synthesis

ABSTRACT: An attempt has been made to synthesize high-purity titanium carbide by sintering a mixture of carbon black with 99.98%-pure titanium dioxide, 99.87%-pure electrolytic titanium or 99.98%-pure titanium. The mixture of components was vacuum sintered at 1570—2270K. Optimum results were obtained from a mixture containing 99.98%-pure titanium in an amount exceeding the stoichiometric by 7.5—10%, to compensate the loss of titanium by evaporation. Sintering of this mixture at 2020K yielded high-purity titanium carbide which contained 20% combined carbon and had a crystal lattice parameter of 4,3281 Å. Oxygen in the initial material reduces

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L 20321-66
ACCESSION NR: AP5018912

the lattice parameter of titanium carbide and makes the synthesis more difficult. Orig. art. has: 4 figures and 2 tables.

[ND]

ASSOCIATION: Leningradskiy khimiko-tekhnologicheskiy institut im. Lensoveta (Leningrad Chemical Technological Institute)

SUBMITTED: 13Mar65 ENCL: 00 SUB CODE: MM, SS

NO REF SOV: 005 OTHER: 006 ATD PRESS: 4076

Card 2/2

L 15736-66 EWT(1)
ACC NR: AP6000898 SOURCE CODE: UR/0181/65/007/012/3698/3700

AUTHORS: Golikova, O. A.; Avgustinnik, A. I.; Klimashin, G. M.; Kozlovskiy, L. V.; Orlan'yan, S. S.; Snetkova, V. A.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Electric properties of carbides of the transition metals of group IV

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3698-3700

TOPIC TAGS: titanium compound, zirconium carbide, hafnium compound, carbide, thermal emf, Hall constant, resistivity, transition element

ABSTRACT: The purpose of the investigation was to compare the electric properties (thermal emf, resistivity, Hall constant) of TiC, ZrC, HfC as functions of the composition in the temperature interval 300 -- 1500K. The data on TiC were taken from an earlier investigation by the authors (FTT v. 7, 2860, 1965). The ZrC and HfC were prepared by the same technology as the TiC. The plots of all the measured

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L 15736-66

ACC NR: AP6000898

quantities against the carbon concentration are approximately the same for all three carbides. This demonstrates that the scattering mechanism and energy spectrum of the carriers are the same in all the compounds. An unexpected result is the fact that the effective masses of the three carbides are equal, since their lattices have different lattice constants and the participating electrons come from different shells. From the fact that the ratio of the distances between the metal and carbide atoms (R) and the radii of the metallic atoms (r) is also constant for all carbides, it is concluded that the orbitals of the metal atoms overlap equally. This explains the equality of the effective masses. The carrier scattering mechanism is briefly discussed. Orig. art. has: 2 figures, 1 formula, and 1 table.

SUB CODE: 07 / SUBM DATE: 23Jul65/ ORIG REF: 004/ OTH REF: 003/

Card 2/2

L 15932-66 EWT(m)/ETC(f)/EWG(m)/EWP(b)/EWP(e)/EWP(t)/T
ACC NR: AP6004510 JD/JG/WB SOURCE CODE: UR/0063/65/010/005/0512/0518

AUTHOR: Avgustinik, A. I. (Prof.)

ORG: none

TITLE: Interaction of oxides and carbides with metals

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 10, no. 5, 1965, 512-518

TOPIC TAGS: transition metal, carbide, boride, nitride, solid solution, liquid metal, cermet, refractory oxide

ABSTRACT: The article reviews the literature on the nature of the interaction between solid oxides and carbides and liquid metals. A discussion of the wettability of the solids, surface tension of the liquid metals, and strength characteristics of cermets such as Al_2O_3-Cr leads to the conclusion that the interaction between solid oxides and transition metals is chemical in nature (new phases, i.e., solid solutions and compounds, are formed), but that special temperature conditions are required to bring it about (special pressure conditions will also be required in the

Card 1/2

UDC: 546.261 + 546.3

L 15932-66

ACC NR: AP6004510

future as technology develops). If such conditions are not achieved, the interaction between the metal and oxide may be nonchemical, i.e., in the nature of dislocation hardening. In the case of carbide-, boride-, and nitride-transition metal systems, interaction at elevated temperatures is chemical in character, as in the case of refractory oxide-transition metal systems, since solid solutions and in some cases chemical compounds are formed. Orig. art. has: 6 figures, 7 tables.

SUB CODE: 11/ SUBM DATE: 00/ ORIG REF: 013/ OTH REF: 025

Card 2/2

L 21440-66 EWP(e)/EWT(m)/EPF(n)-2/EWA(d)/T/EWP(t)/EWT(k) IJP(c) JD/WW/JG

ACC NR: AP6008267 SOURCE CODE: UR/0080/66/039/002/0318/0323

AUTHOR: Avgustinik, A. I.; Ordan'yan, S. S.

ORG: none

TITLE: Structure of the alloys of Zr-C-Ta system

SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 2, 1966, 318-323

TOPIC TAGS: zirconium carbon tantalum system, zirconium alloy, carbon containing alloy, tantalum containing alloy

ABSTRACT: The interaction between zirconium carbides and tantalum over a wide range of temperatures and concentrations has been investigated. Specimens of 13 alloys 10 mm in diameter and 10 mm thick were obtained by compacting a mixture of powdered zirconium carbide, 99.5%-pure tantalum, calcium-reduced zirconium, and acetylene soot under a pressure of 4 t/cm^2 and vacuum sintering at 2273K for 1—2 hr. Sintered specimens were ground to a particle size of less than 60 μ, and compacted and sintered 3—6 times. It was found that with increasing tantalum content in solid solution, the solidus temperature decreases, and in the region of two-phase alloys, drops to 2750K, at which temperature a maximum solubility of tantalum of about 35 at% is reached. On the basis of x-ray diffraction, metallographic, and

Card 1/2 UDC: 546.3—19'831'26'883

L 21440-66
ACC NR: AP6008267

chemical analyses the solidus temperatures for all the alloys tested were determined and the section of the Zr-C-Ta system at 2273K and the section of the ZrC-Ta system were plotted. No ternary compounds were found. The Zr-C-Ta system may be useful for designing heat-resistant alloys: either single-phase alloys on a base of cubic carbide, or two-phase cermets with metallic tantalum as a binding material. Orig. art. art. has: 4 figures and 2 tables. [AZ]

SUB CODE: 11, 13/ SUBM DATE: 17Mar65/ ORIG REF: 009/ OTH REF: 011
ATD PRESS: 4221

Card 2/2

L 24353-66 EWT(e)/EWT(m)/EWG(f)/EWG(m) JD/JG/AT/WH

ACC NR: AP6007253 (A) SOURCE CODE: UR/0363/66/002/002/0299/0302

AUTHOR: Ordan'yan, S.S.; Kraskovskaya, L.A.; Avgustinik, A.I.

ORG: Leningrad Technological Institute im. Lensovet (Leningradskiy tekhnologicheskiy institut)

TITLE: Phase diagram of the HfC-Mo system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 2, 1965, 299-302

TOPIC TAGS: hafnium compound, carbide, molybdenum, phase diagram

ABSTRACT: The article gives the results of a study of the reaction of hafnium carbide and molybdenum over a wide range of compositions and temperatures. The alloys were prepared from hafnium carbide powder containing 6.2% bound carbon, 0.2% free carbon, and 0.1% nitrogen, and molybdenum powder of more than 99.5% purity. The chemical compositions of the 14 alloys investigated are given in a table; the weight % molybdenum varied from 1 to 95%. Heat treatment of objects made of these alloys was done at a temperature of more than 2000°C. X-ray, metallographic, and chemical analyses were made of alloys lying between hafnium carbide and molybdenum in the hafnium-carbon-molybdenum system. On the basis of the experimental data and of determinations of the

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UDC: 541.123.2

L 24353-66
ACC NR: AP6007253

melting temperature, a phase diagram is constructed for the quasi-binary eutectic type system hafnium carbide-molybdenum, with a eutectic composition of approximately $Hf_{0.143}Mo_{0.857}C_{0.143}$ (alloy with 75 weight % molybdenum) at 2310°C. Orig. art. has: 3 figures and 1 table.

SUB CODE: 07/ SUBM DATE: 05Jul65/ ORIG REF: 007/ OTH REF: 011

Card 2/2 pld

L 29776-66 EWT(m)/EWP(t)/ETI IJP(c) JD
ACC NR: AP6015069 (A) SOURCE CODE: UR/0363/66/002/005/0855/0863

AUTHOR: Neshpor, V. A.; Ayrapetyants, S. V.; Ordan'yan, S. S.; Avgustinik, A. I. 63 B

ORG: State Institute of Applied Chemistry (Gosudarstvennyy institut prikladnoy khimii); Institute of Semiconductors, AN SSSR (Institut poluprovodnikov AN SSSR); Leningrad Technological Institute im. Lensovet (Leningradskiy tekhnologicheskiy institut)

TITLE: Effect of the chemical composition of group IV and V transition metal monocarbides in the region of homogeneity on the temperature dependence of their resistivity and thermal emf

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 5, 1966, 855-863

TOPIC TAGS: carbide, zirconium carbide, vanadium compound, niobium compound, tantalum compound, thermal emf, resistivity, transition element, temperature dependence, chemical composition, electron structure

ABSTRACT: Continuing their study of the electronic structure of group IV and V transition metal monocarbides, the authors investigated the temperature dependence of the electrical resistivity and absolute differential thermal emf of zirconium,

Card 1/2 UDC: 546.261:669.018.5

L 29776-66

ACC NR: AP6015069

vanadium, niobium and tantalum monocarbides which were prepared by sintering. Conduction in these monocarbides was found to be metallic in character and due to free electrons. As the carbon content (i.e., the number of carbon vacancies) of the monocarbides changes, there is a change both in residual resistivity and in the slope of the temperature dependence of the resistivity and thermal emf; there is a drop in carbon content in the region of homogeneity of the monocarbides. This can be interpreted by assuming a decrease in the density of states and in the rate at which the area of the Fermi surface changes with the energy on passing from carbon-rich monocarbides with the prevalence of directed M-C bonds to carbon-poor monocarbides with the prevalence of directed M-M bonds. Orig. art. has: 8 figures and 2 formulas.

SUB CODE: 11,07,20/ SUBM DATE: 22Mar65/ ORIG REF: 017/ OTH REF: 013

Card 2/2

L 40003-66 EWP(k)/EWT(m)/T/EWP(e)/EWP(v)/EWP(t)/ETI IJP(c) WH/WW/JD

ACC NR: AP6008276 SOURCE CODE: UR/0080/66/039/002/0455/0457

AUTHOR: Avgustinik, A. I.; Zhuravlev, G. I.; Vigdergauz, V. S. 39 B

ORG: none

TITLE: Effect of copper oxides on the adhesion of some glasses to copper

SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 2, 1966, 455-457

TOPIC TAGS: adhesion, glass coating, cuprous oxide, wire, copper

ABSTRACT: The strength of adhesion of glass coatings to copper wire was investigated. The authors used glass consisting of CaO-Al_2O_3-SiO_2-B_2O_3 to which 0.5, 1.0, 1.5, 2.0, 3.0, 5.0 and 8% copper oxide was added and calcinated at 1200°C for 10, 20, 30 and 50 sec. At a certain radius of the bend on the exterior part of glass coating cracks appeared in the form of a half ring, the planes of which were perpendicular to the axis of the wire. If edges of crack zones are uniform and plumb to the surface of the wire, this indicates that the destruction resulted from scaling; if the crack zone is funnel shaped, this means that the destruction is due to the elastic stresses resulting from coating. It was noticed that at a certain copper oxide content in glass, the cohesive force reaches a maximum, then drops. Both brief as well as extended calcination decreased the cohesive force of coating. An equation is given for determining cohesive force. Orig. art. has: 3 figures, 3 formulas.

SUB CODE: 07,11/ SUBM DATE: 11Jun64/ ORIG REF: 003

Card 1/1 UDC: 666.113

L 01224-67 EWP(e)/EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JG/WH

ACC NR: AP6032944 SOURCE CODE: UR/0131/66/000/010/0050/0055

AUTHOR: Gropyanov, V. M.; Yudin, B. F.; Avgustinik, A. I.

ORG: All-Union Institute of Refractories (Vsesoyuznyy institut ogneuporov)

TITLE: High-temperature reactions in the TiC-ZrO_2 system

SOURCE: Ogneupory, no. 10, 1966, 50-55

TOPIC TAGS: refractory compound, titanium carbide, zirconia, high temperature research, solid state, reaction mechanism

ABSTRACT: Solid-state chemical reactions in the TiC—ZrO_2 system have been studied within the 1700—2400 K range in vacuum. Correlation of experimental data with thermodynamic analysis data indicated that only three reactions occur in the system within the temperature range studied. The direction of the chemical process and predominance of one or another of the three reactions depend on temperature, gaseous atmosphere composition, and the ratio of components in the starting mixture. Orig. art. has: 4 figures, 3 tables, and 13 equations.

[JK]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 001/ ATD PRESS: 5096

Card 1/1 egk

UDC: 666.76.001.5

L 06553-67 EWT(m)/EWP(t)/ETI IJP(c) WW/JD/JG

ACC NR: AP6008266 (A) SOURCE CODE: UR/0080/66/039/002/0312/0317

AUTHOR: Ordan'yan, S. S.; Avgustinik, A. I.; Vigdergauz, V. Sh.

ORG: none

TITLE: The composition of alloys of the Zr-C-Nb system

SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 2, 1966, 312-317

TOPIC TAGS: fusible alloy, alloy composition, phase composition

ABSTRACT: Compositions of the fused alloys of the Zr-C-Nb system were determined permitting the construction of a triangular composition diagram at 2273°K. Because most phases have nonstoichiometric amounts of the elements, the precise intersections of the phases remain obscure. A ZrC-Nb composition-temperature diagram is hypothesized indicating the solubility of Nb in ZrC from 2000-3773°K. On the basis of the experiments, it is concluded that a ZrC-Nb alloy may be used as a heat-resistant construction material. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 07/ SUBM DATE: 17Mar65/ ORIG REF: 005/ OTH REF: 007

UDC: 546.3-19'831'26'882

Card 1/1

L 07823-67 EWP(e)/EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/WW/JG/WH
ACC NR: AP6034204 (N) SOURCE CODE: UR/0153/66/009/004/0528/0532

AUTHOR: Avgustinik, A. I.; Kozlovskiy, L. V.; Klimashin, G. M. 52 B

ORG: Department of Chemistry and the Technology of Fine Technical Ceramics, Leningrad Technological Institute im. Lensovet (Kafedra khimii i tekhnologii tonkoy tekhnicheskoy keramiki, Leningradskiy tekhnologicheskiy institut)

TITLE: High-temperature reactions between titanium carbide and certain oxides

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 9, no. 4, 1966, 528-532

TOPIC TAGS: titanium carbide, refractory oxide, zirconia, hafnium oxide, thoria, beryllia, high temperature ceramic material

ABSTRACT: A discrepancy between calculated and experimental temperatures of titanium carbide reactions with refractory ZrO_2, HfO_2, ThO_2, and BeO led to a study of the reaction products which were obtained by sintering at 1770—2470K in vacuum the compacted mixtures of pure TiC with 10—80 wt.% of one of the refractory oxides. Weight loss, shrinkage, density, and porosity of the sintered samples were measured and the effects of the sintering temperature and the oxide content in

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the starting mixture were evaluated. The data obtained, the lattice parameter data obtained by x-ray phase analysis, and the micrographs made it possible to establish in each case the mechanism of reactions and the phase formation. As a general rule, formation of TiC-base solid solutions with interstitial atoms of the second metal occurs in the presence of a large excess of the oxide and a titanium oxycarbide and metal form in the case of deficiency of the oxide in the starting mixture. Evolution of CO was detected in all cases. The formation of Be_2C was detected by x-ray analysis in the reaction of TiC with 80% BeO. Complex oxycarbide solid solutions were formed in the reactions of TiC with 50% ZrO_2 or HfO_2 [sic]. ThO_2 was found to be the least reactive of all the oxides studied, in agreement with theory. The reaction of TiC with 50% ThO_2 at 2470K yielded a spongy surface phase of ThC_x. Orig. art. has: 3 figures, 1 table, and 3 formulas.

SUB CODE: 11/ SUBM DATE: 12Oct64/ ORIG REF: 010/ ATD PRESS: 5101

L 06576-67 EWT(m)/EWP(q)/EWA(w)/EWP(t)/ETI IJP(c) AT/WH/JD/JG
ACC NR: AP6029818 (A) SOURCE CODE: UR/0363/66/002/008/1439/1443

AUTHOR: Avgustinik, A. I.; Golikova, O. A.; Klimashin, G. M.; Neshpor, V. S.; Ordan'yan, S. S.; Snetkova, V. A. 55 B

ORG: Leningrad Institute of Technology im. Lensovet (Leningradskiy tekhnologicheskiy institut); Semiconductor Institute, Academy of Sciences SSSR (Institut poluprovodnikov Akademii Nauk SSSR) 27

TITLE: Dependence of certain electro- and thermophysical properties of zirconium monocarbide on the carbon content within the range of homogeneity 27

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 8, 1966, 1439-1443

TOPIC TAGS: zirconium carbide, solid mechanical property, solid physical property, electric conductivity, thermal emf, Hall coefficient

ABSTRACT: The dependence of electrical resistivity, absolute thermal emf, Hall coefficient, and thermal conductivity of zirconium monocarbide was studied for 36-48 atom % C contents in the carbide. The zirconium carbide samples were prepared by fusing high purity zirconium and carbon at 1800°C in vacuo followed by sintering at 2200°C. The properties, compositions, and lattice parameters for various zirconium samples are graphed and tabulated. It was found that free electrons act as current carriers within zirconium carbide. The electrical resistivity, the thermal emf, and the Hall coefficient were found to decline and the thermal conductivity was found to increase with

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L 06576-67

ACC NR: AP6029818

declining contents of the combined carbon in zirconium monocarbide. This phenomena are related to the release of a portion of the zirconium electrons from the localized metal-carbon bonds. The specific resistivity and absolute thermal emf were found to increase linearly with increasing temperature. The slope of these lines was found to decrease with decreasing carbon content in zirconium carbonate. This phenomenon is apparently due to the decline in the effective mass of the conduction electrons. Orig. art. has: 2 figures and 1 table.

SUB CODE: 11,20/SUBM DATE: 06Oct65/ ORIG REF: 013/ OTH REF: 015

Card 2/2

L 18844-67 EWT(m)/EWT(e)/EWP(t)/ETI IJP(c) JD/WW/JD/AT/AH/JH
ACC NR: AT6027154 (A) SOURCE CODE: UR/0000/65/000/000/0257/0264

AUTHOR: Avgustinik, A. I.; Vigdorgauz, V. S.; Gandol'sman, I. L.; Gorfunkel', L. V.; Gropyanov, V. M.; Drozdetskaya, G. V.

ORG: none

TITLE: Use of a cermet made of tungsten and aluminum oxide in the preparation of cathodic heaters of electron tubes

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 257-264

TOPIC TAGS: high temperature cermet material, tungsten, aluminum oxide

ABSTRACT: The aims of the study included (1) the selection of W-Al_2O_3 cermet compositions suitable for the preparation of cathodic heaters, (2) a study of their physical properties (resistivity as a function of temperature, emissivity, strength, porosity, etc.) as functions of the composition and processing. The influence of the regularity of distribution of the metal (tungsten) and oxide (α-Al_2O_3) particles and degree of dispersion of the starting materials on the properties of the sintered cermets was determined. The sintering was found to worsen with rising tungsten content: the shrinkage and relative density decrease, and the porosity increases. The mechanical and elastic properties are determined by the porosity. The optimum combination of

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L 08404-67
ACC NR: AT6027154

properties corresponds to a cermet composition containing 50-75% W and 50-30% Al_2O_3, and this composition is recommended for applications in industry after final improvements in the process of its preparation are made. Orig. art. has: 5 figures, 5 tables and 1 formula.

SUB CODE: 11/ SUBM DATE: 03Feb65/ ORIG REF: 005/ OTH REF: 002

Card 2/2 1 5

L 45567-67 EWP(e)/EWT(m)/EWP(t)/ETI IJP(c) JD/JG/GD/AT/JAJ/WH

ACC NR: AM6027153 (A) SOURCE CODE: UR/0000/65/000/000/0250/0256

AUTHOR: Avgustinik, A. I.; Gropyanov, V. M.; Drozdotskaya, G. V.; Vigdorgauz, V. S.

ORG: none

TITLE: Kinetics of formation and decomposition of solid solutions in refractory carbide systems

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 250-256

TOPIC TAGS: solid solution, decomposition, zirconium carbide, niobium compound, zirconium compound

ABSTRACT: The formation of solid solutions in ZrC-NbC and TiC-NbC systems was studied as a function of temperature and duration of the synthesis process. The products were analyzed by x-ray, metallographic and chemical methods. In both systems, the matrix of the solid solution is NbC, whose lattice can increase in volume without breaking its chemical bonds. As the holding time increases, a gradual decomposition of the solid solutions takes place. Concentration-time curves for solid solutions at various synthesis temperatures showed that the formation of solid solutions is faster and their decomposition slower the higher has been the synthesis temperature. The data obtained permit one to calculate the time required for the maximum solubility of TiC

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L 08447-67

ACC NR: AT6027153

and ZrC in NbC to be reached. The observed decomposition of the solid solutions in the ZrC-NbC systems leads to the conclusion that a two-phase region exists in their phase diagrams at below-solidus temperatures. Orig. art. has: 5 figures and 3 tables.

SUB CODE: 07/ SUBM DATE: 04Jul64/ ORIG REF: 013/ OTH REF: 001

L 06296-67 EWT(m)/EWP(e)/EWP(t)/ETI IJP(c) AT/WH/JD/JG/GD

ACC NR: AT6027152 (A) SOURCE CODE: UR/0000/65/000/000/0244/0250

AUTHOR: Avgustinik, A. I.; Golikova, O. A.; Klimashin, G. M.; Kozlovskiy, L. V.

ORG: none

TITLE: Effect of oxygen on certain properties of titanium carbide

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 244-250

TOPIC TAGS: titanium compound, carbide, oxygen impurity

ABSTRACT: In a study of alloys of the TiC-TiO-Ti system, x-ray structural data showed that the contamination of TiC_x with oxygen causes a decrease in the size of the unit cell, this effect being more pronounced the closer the composition is to the stoichiometric proportion of TiC_x. This along with the influence of vacancies accounts for the great scatter of results obtained by various authors in their study of the lattice parameter of $TiC_{1.0}$. The melting point and microhardness of titanium carbide contaminated with oxygen decrease with increasing number of defects in the lattice, and to a lesser degree depend on the kind of metalloid atoms. As the oxygen content rises, the microbrittleness decreases at first, then begins to increase because of increasing ionic bond character. The electron concentration in titanium carbide containing some oxygen is influenced by two effects: when the number of vacancies in the metalloid

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L 00295-67

ACC NR: AT6027152

sublattice (i. e., the number of conduction electrons) is small, the current carrier concentration grows, since oxygen atoms give up to the conduction band their excess electrons relative to carbon. When the number of vacancies in the metalloid sublattice is large, the oxygen atoms do not give up their electrons, and oxygen in its reaction with titanium ties up the titanium electrons, causing a drop in the carrier concentration. Titanium carbide containing an oxygen admixture shows a metallic temperature dependence of the resistivity and thermal emf. The mobility of electrons at T = const drops with their increasing concentration and is relatively insensitive to the concentration of defects in the metalloid sublattice. The predominant scattering mechanism appears to involve scattering by lattice vibrations, and the energy dependence of the relaxation time is close to that observed in semiconductors. Orig. art. has: 13 figures.

SUB CODE: 07/ SUBM DATE: 09Apr65/ ORIG REF: 009/ OTH REF: 003

Card 2/2

L 00295-66 EWT(m)/EWP(e)/EWT(t)/ETI IJP(c) AT/WW/JD/JG/GD

ACC NR: AT6027151 SOURCE CODE: UR/0000/65/000/000/0241/0244

AUTHOR: Avgustinik, A. I.; Golikova, O. A.; Klimashin, G. M.; Kozlovskiy, L. V.; Neshpor, V. S.

ORG: none

TITLE: Dependence of certain electrophysical properties of titanium monocarbide on the carbon content

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 241-244

TOPIC TAGS: titanium compound, carbide, Hall constant, Hall mobility, conduction electron, resistivity, carbon

ABSTRACT: The dependence of the resistivity ρ, thermal emf α and Hall constant R of titanium monocarbides on the carbon content was studied in the region of homogeneity on samples prepared from powdered Ti and acetylene black at 1750°. All the samples showed a negative Hall constant, indicating an n-type conductivity; the absolute value of R decreases rapidly with decreasing carbon content, indicating an increase in the concentration of free conduction electrons. The absolute differential thermal emf also decreases with diminishing carbon content. The resistivity decreases with decreasing carbon content in monocarbide phases TiC_x, this being in accord with the in-

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L 06295-67
ACC NR: AT6027151

creasing free electron concentration. The Hall mobility of electrons decreases from carbon-rich to carbon-poor titanium monocarbides, due to an increase in the fraction of conduction electrons scattered by the carbon vacancies. Orig. art. has: 3 figures and 1 table.

SUB CODE: 07,20/ SUBM DATE: 31Mar65/ ORIG REF: 009/ OTH REF: 016

Card 2/2

L 06294-67 EWT(m)/EWP(e)/EWP(t)/ETI IJP(c) AT/WH/JD/NW/JG/GD

ACC NR: AT6027150 (A) SOURCE CODE: UR/0000/65/000/000/0220/0228

AUTHOR: Ordan'yan, S. S.; Avgustinik, A. I.; Vigdergauz, V. S.

ORG: none

TITLE: Phase diagram of ZrC-Mo

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 220-228

TOPIC TAGS: zirconium carbide, molybdenum, alloy phase diagram

ABSTRACT: On the basis of x-ray diffraction, metallographic and chemical analyses and measurements of temperatures of the start of fusion in the Zr-C-Mo system, a phase diagram of the quasi-binary section ZrC-Mo was plotted (see Fig. 1). It was found that the solubility of Mo increases with rising temperature; it amounts to 1.2, 3.1 and 9.9 at. % at 2273, 2373 and 2520°K respectively. The solubility of ZrC in Mo is slight (0.2 at. % at 2273°K). The composition of the eutectic in the ZrC-Mo system is close to $Zr_{0.189}Mo_{0.811}C_{0.189}$ (80 wt. % Mo). On the basis of the literature and their own data, the authors suggest that the $Me^{IV}C-Me^{VI}$ (TiC-Mo, TiC-W, ZrC-Mo, ZrC-W) sections in the corresponding ternary systems are quasi-binary and that the phase diagrams of these sections are of eutectic type. The acceptor capacity criterion 1/Nn of group IV metals forming isostructural carbides and data on the eutectic temperatures

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ACC NR: AT6027150

in the TiC-Mo(W), ZrC-Mo(W) and HfC-Mo systems were used to find the eutectic temperatures in the HfC-W system (3200°K). Orig. art. has: 5 figures and 1 table.

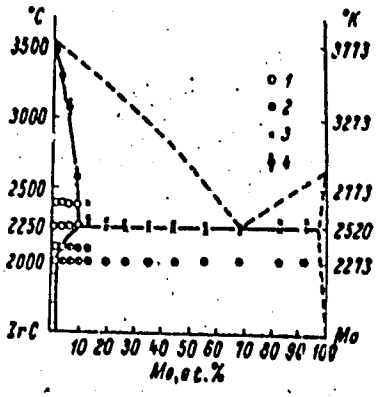

Fig. 1. Phase diagram of the ZrC-Mo system.
1 - single phase; 2 - two phases;
3 - start of fusion of two-phase alloys;
4 - start of fusion of single-phase alloys.

SUB CODE: 11/ SUBM DATE: 02Jul64/ ORIG REF: 011/ OTH REF: 013

Card 2/2

L 06290-67 EWT(m)/EWP(e)/EWP(v) WH/WW/GD

ACC NR: AT6027146 SOURCE CODE: UR/0000/65/000/000/0189/0192

AUTHOR: Avgustinik, A. I.; Zhuravlev, G. I.; Vigdergauz, V. S.

ORG: none

TITLE: Interaction of certain glasses with copper at elevated temperatures

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 189-192

TOPIC TAGS: silicate glass, borate glass, protective coating, copper, cuprous oxide

ABSTRACT: The processes occurring during firing of vitreous coatings of the CaO-Al_2O_3-SiO_2-B_2O_3 system on copper were studied. Coatings about 0.2 mm thick were deposited on plates 30 x 30 x 0.8 mm by electrophoresis and fired at 1020-1220°K for 1.5, 2.5, 3.5 and 4.5 min. Cupric oxide was introduced into the coatings in the amount of 0-0.8%. Chemical analysis showed that a certain amount of copper migrates into the coatings from the copper substrate during firing. The copper thus dissolved in the coating is present in the form of cuprous oxide aggregates which are colloidal in size. The presence of Cu^{2+} ions in the coatings increases the oxidation rate of copper under the coatings during firing and the adhesion of the coatings to copper. The increase in adhesive strength is apparently due to the formation of chemical bonds between

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ACC NR: AT6027146

those ions and the surface atoms of copper via oxygen. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: 11Jun64/ ORIG REF: 002/ OTH REF: 007

Card 2/2

ACC NR: AT6027144 (A) SOURCE CODE: UR/0000/65/000/000/0154/0161

AUTHOR: Avgustinik, A. I.; Petrova, V. Z.; Lysenko, Ye. S.

ORG: none

TITLE: Ultrasonic study of elastic properties of silicate glass based on slag of the Cholyabinsk metallurgical plant in the course of heterogeneous crystallization

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 154-161

TOPIC TAGS: glass property, silicate glass, ultrasonic wave, crystallization, slag

ABSTRACT: Data are presented on the change in the physicomechanical properties of silicate glasses made from blast-furnace slag of the Cholyabinsk metallurgical plant as a function of the heat treatment conditions. The following parameters were investigated in the course of crystallization: rate of travel of longitudinal ultrasonic waves (C_L), transverse ultrasonic waves (C_S), Poisson's ratio (μ), volume weight (γ), mechanical strength in compression (σ_c) and shrinkage (H). The degree of crystallization was obtained from ultrasonic and x-ray data. It was found that a particularly strong structural material with a dense structure and high physicomechanical parameters can be obtained by adding to the slag crystallization nucleators BeO, TiO_2 and kaolin in optimum amounts of 0.5, 2 and 10 wt. %. Readjustment of the initial slag

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ACC NR: AT6027144

charge to the melilite composition leads to the formation, after a double heat treatment, of a crystallized monomineral slag brick having · high wear-resistance and elastic and physicomechanical properties. Orig. art. has: 6 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 25Feb63/ OTH REF: 002

Card 2/2

ACC NR: AT6027143 (A) SOURCE CODE: UR/0000/65/000/000/0144/0148

AUTHOR: Avgustinik, A. I.; Petrova, V. Z.; Yashukova, T. I.

ORG: Chelyabinsk Polytechnic Institute (Chelyabinskiy politekhnicheskiy institut)

TITLE: Study of the physicomechanical properties of glasses based on readjusted slags containing an admixture of Na_2SiF_6 in the course of crystallization

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 144-148

TOPIC TAGS: slag, glass property, catalyzed crystallization

ABSTRACT: The object of the study was to clarify the nature of the change in physicomechanical properties in the course of crystallization of silicate glasses made from Southern Ural slags. The chemical composition of the slags was readjusted in order to obtain glass whose temperature of crystal growth would be above the temperature of formation of nuclei. Na_2SiF_6 was used as the crystallization catalyst, and ultrasonic analysis (speed of travel of longitudinal and transverse waves) was used to determine the degree of crystallization and the optimum crystallization conditions. The data showed that the properties of the slag brick improved as the crystallization progressed. The microcrystallized slag brick obtained had high physicomechanical and chemical properties: strength, hardness, wear resistance, density, chemical stability

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ACC NR: AT6027143

and low brittleness. The physicomechanical properties of the pyroceramic materials obtained were much better than those of the original glasses, and make them suitable for use as high-strength construction materials. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 11/ SUBM DATE: 25Mar63/ ORIG REF: 005/ OTH REF: 003

Card 2/2

L 30203-67 EWT(m)/EWP(e)/EWP(v)/EWP(t)/ETI IJP(c) WH/WW/JD/GD

ACC NR: AT6027140 SOURCE CODE: UR/0000/65/000/000/0110/0112

AUTHOR: Avgustinik, A. I.; Zhuravlev, G. I.; Vigdergauz, V. S.

ORG: none

TITLE: Effect of copper oxides on the electric conductivity of certain glasses

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 110-112

TOPIC TAGS: copper compound, glass property, silicate glass, borate glass, electric conductivity

ABSTRACT: The effect of copper oxide on the electric conductivity of glasses of the system $CaO-Al_2O_3-SiO_2-B_2O_3$ and on coatings of these glasses on copper plates was studied. The glasses contained 0.5, 1.0, 1.5, 2.0, 3.0, 5.0 and 8.0% CuO. The coatings were fired at 1220°K in a nitrogen atmosphere for 1.5, 2.5, 3.5 and 4.5 min. In both cases, the electric conductivity was found to decrease exponentially up to 870°K. The activation energy of the initial glasses and coatings made from them is the same. The conductivity depends on the valence state of copper in the glass, not on the amount of copper. Reflection spectra in the visible taken on the initial glasses and coatings showed that an increase in conductivity occurs in cases where colloidal aggregates of cuprous oxide (or metallic copper) are formed in them. Orig. art. has:

Card 1/2

ACC NR: AT6027140

5 figures and 1 formula.

SUB CODE: 11/ SUBM DATE: 11Jun64/ OTH REF: 001

Card 2/2 gd

L 06016-67 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6032298 SOURCE CODE: UR/0226/66/000/009/0050/0054

AUTHOR: Ordan'yan, S. S.; Avgustinik, A. I.

ORG: Leningrad Order of the Red Banner of Labor Technological Institute im. Lensovet (Leningradskiy ordena Trudovogo Krasnogo Znameni tekhnologicheskiy institut)

TITLE: Temperature dependence of the grain size of niobium carbide

SOURCE: Poroshkovaya metallurgiya, no. 9, 1966, 50-54

TOPIC TAGS: temperature dependence, grain size, grain growth, niobium carbide

ABSTRACT: An attempt has been made to investigate the temperature dependence of the grain size of nonstoichiometric niobium carbide $NbC_{0.80}$ in the temperature range 1600—3300K. The energy of grain growth activation is equal to 65.0 Kcal/mol. The value of this energy makes it possible to consider that this process is controlled by the boundary and surface diffusion. Orig. art. has: 2 figures. [Based on authors' abstract]

SUB CODE: 11/ SUBM DATE: 10Dec65/ ORIG REF: 007/ OTH REF: 007/

Card 1/1 mc

AGOL, V.I.; MASLOVA, S.V.; CHUMAKOVA, M.Ya; AVGUSTINOVICH, G.I.

Chromatographic fractionation of poliovirus populations. Acta virol. 6 no.3:253-257 MY '62.

1. Institute of Poliomyelitis and Viral Encephalitis, U.S.S.R. Academy of Medical Sciences, Moscow.
(POLIOMYELITIS VIRUSES chem) (CHROMATOGRAPHY)

AVGUSTINOVICH, K.A.

Effect of processing the gelatin solution with magnesium oxide and aluminum oxide on the properties of photographic emulsions. Trudy LIKI no.3:188-192 '55. (MLRA 9:8)

1. Kafedra tekhnologii proizvodstva kinofotomaterialov.
(Photographic emulsions)

AVGUSTINOVICH, K.A.; FAYERMAN, G.P.

Equation of the rate process of the recrystallization of silver halide. Trudy LIKI no.4:143-149 '56. (MLRA 10:5)

1.Kafedra tekhnologii proizvodstva kinofotomaterialov.
(Photographic emulsions)

АВГУСТИНОВИЧ, К.А.

USSR/Chemical Technology - Chemical Products and Their Application. Photographic Materials. I-6

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2416

Author : Fayerman, G.P., Avgustinovich, K.A.
Inst : -
Title : Effect of Inhibitors on Kinetics of Physical Maturation of Photographic Emulsions.

Orig Pub : Zh. nauchn. i prikl. fotogr. i kinematogr., 1957, 2, No 3, 176-186

Abstract : A study was made of the effect on the dispersity of emulsions of various factors that affect the process of their physical maturation (PM). Determinations were made of the dispersity of emultion, the average size was computed of the silver halide crystals, of their dispersion, and correlation was determined between 1/N (N -- number of crystals per 1 ml emulsion) and the time of maturation. On studying the kinetics of maturation of emulsions,

Card 1/3

USSR/Chemical Technology - Chemical Products and Their Application. Photographic Materials. I-6

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2416

product of their Ag-salt. The greatest effect is produced by II and I, the least by IV. However, on increase of the pH of the emulsion the effect of IV becomes appreciably greater, and in ammonial emulsions IV is a strong inhibitor of PM. It was calculated that maximal inhibitory action of any stabilizing agent takes place at such a concentration of this agent which provides a monomolecular layer of the agent at the surface of AgBr crystals. On the basis of the results thus obtained a formula has been derived which expresses the kinetics of PM: $1/N_t = Kt^{\alpha}$, wherein K and α are constants.

Card 3/3

AVGUSTINOVICH, M. S., Cand Med Sci -- (diss) -- "Biological testing of the antithyroid activity of rhodanine (2-thionethiazolidone-4) and certain of its derivatives". L'vov, 1960. 15 pp (L'vov State Med Inst), 200 copies (KL, No 15, 1960, 139)

DYBAN, A. P., doktor med. nauk; DEMKOV, L. P., kand. med. nauk; AVGUSTINOVICH, M. S. (L'vov)

Changes in β-basophils in varying proportions of the amount of thyrotropic hormone in the pituitary gland and the blood of white rats. Probl. endok. i gorm. no.6:33-42 '61. (MIRA 14:12)

1. Iz kafedry gistologii i embriologii (zav. - dotsent A. P. Dyban) L'vovskogo meditsinskogo instituta (dir. - prof. L. N. Kuzmenko)

(BLOOD CELLS) (PITUITARY HORMONES)

DYBAN, A.P.; DEMKIV, L.P.; AVGUSTINOVICH, M.S.

Inhibition of implantation (diapause) in rats kept on a deficient saccharose diet. Dokl. AN SSSR 149 no.6:1453-1456 Ap '63.
(MIRA 16:7)

1. L'vovskiy gosudarstvennyy meditsinskiy institut. Predstavleno akademikom I.I.Shmal'gauzenom.

(Diapause) (Sucrose)

LYALIKOV, K.S.; KIRSH, Yu.E.; KOVALEVA, K.A.; AVGUSTINOVICH, N.P.

Sensitometry of light sensitive polymers. Zhur.nauch.i prikl.fot. i kin. 10 no.3:200-206 My-Je '65.

1. Leningradskiy institut kinoinzhenerov. (MIRA 18:11)

POLONY,R.; VRTYAK, O. Ya.; KOPPEL, Z.; AVGUSTINSKIY, V.

Characteristics of the course of rabies in a province. Veterinariia 39 no.5:63-65 My '62 (MIRA 18:1)

1. Veterinarnaya bakteriologicheskaya laboratoriya i veterinarnyy fakul'tet, Koshitse.

KRYUKOV, P.A.; NOMIKOS, L.I.; AVGUSTINSKIY, V.L.; POGOREL'SKIY, N.S.

Rock solutions in the region of the Caucasian mineral waters. Dokl. AN SSSR 157 no.5:1118-1120 Ag '64. (MIRA 17:9)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. Predstavleno akademikom A.P. Vinogradovym.

AVGUSTOV, I.A.

Pneumatic press for rubber vulcanization. Biul.tekh.-ekon.inform. Gos.nauch.-issl.inst.nauch. i tekh.inform. 16 no.11:25-26 '63. (MIRA 16:11)

MOLCHANOV, G.N.; KRYSHTAL', V.N.; AVGUSTINOVICH, V.G.

Using a new method of cutting small-module bevel gears for cotton pickers. Sel'khozmashina no.12:21-24 D '55. (MLRA 9:3)
(Gear cutting) (Cotton-picking machinery)

AVGUSTINOVICH, V.G.; NOVITSKIY, O.V.

Knocking-out machined parts from centerless grinding machines.
Stan. i instr. 30 no.1:30 Ja '59. (MIRA 12:1)
(Grinding machines--Attachments)

POLONY, R., VRTYAK, O. YA. KOPPEL, Z. and AVGUSTINSKIY, V. (Veterinary Bacteriological Laboratory and Veterinary Faculty, Kosice, Czechoslovakia)

"Nature of the course of rabies in one district"

Veterinariya, vol. 39, no. 5, May 1962 p. 63

AVGUSTNIK, A.V.; KOSLOVSKY, L.V.

Measurement of the dielectric constant and dielectric loss as method of studying the strength of ionic bonds in minerals after heating. J. appl. Chem., USSR, '52, 25, 265-276. (MLRA 5:5)
(BA - A I Mr '53:234)

AVGUSTOV, Yu. Ay., inzh.

Depositing plastic coatings on metal articles by immersion in a fluidized powder. Khim.mash. no.2:44-45 Mr-Ap '60. (MIRA 13:6)

(Metals--Finishing) (Protective coatings)

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

poured layer of polyethylene powder should be not less than 100 mm. The air consumption is up to 380 m^3/m^2. h, the air pressure is 0.5-6 atm. For the coating of a preheated part by immerging it into the whirling powder, thermoplastics are employed, the decomposition temperature of which is much higher than the melting point, such as polyethylene and polyamides. Moreover, the thermoplastics powder should be free-flouring with an angle of repose of not less than 40°. Bulk materials such as polyethylene whose angle of repose is larger than 50° do not ensure a high-quality coating because the particles form lumps on the part to be coated. It is pointed out that the powder should have the mesh No. 025. The workpiece should be carefully cleaned before processing and preheated up to 250-340°C for LP-polyethylene; the process takes 5-60 sec. The low heat capacity of thin-walled parts does not ensure sufficient coating. Another factor determining the coating thickness is the time of treatment. At 250°C of the preheater and a holding time in the whirling apparatus of 20 sec, the thickness of the polyethylene coat is about 0.6-0.65 mm for a steel part of 10 mm wall thickness, and for 40 sec holding time the coating thickness is 1 mm. The turbulent spraying method has been mastered for a number of polymers such as LP-polyethylene and polyamides. The enclosed diagram show the ratio of component holding time to coating thickness for various tem-

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S/193/61/000/002/004/009
A005/A004

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

peratures. The maximum preheating temperature of the part for polyamide coating is 370°C. Some physical-mechanical properties were compared of coatings obtained on the LP-polyethylene base both by the flame and turbulent spraying methods. The latter method yielded better results: the tensile strength of the film after quenching in cold water is about 1.54 kg/mm^2 compared to 1.268 for flame spraying; the adhesion to the sublayer is 0.71 and 0.425 kg/mm^2 respectively. Coatings of HP-polyethylene are recommended to be cooled carefully in a heated chamber at intermediate temperatures. Polyisobutylene is added to HP-polyethylene to increase the elasticity, while carbon black protects it from UV-radiation. Coatings on the LP-polyethylene base laid on by the whirling method require rapid cooling. The quality of coating increases with the application of an inert gas instead of air for whirling. The addition of fine-dispersed carbon black to LP-polyethylene to decrease the aging rate under UV-radiation somewhat reducesthe tensile strength of the coating. The NIIKhimmash carried out tests of metallic specimens protected by polyethylene coatings applied by the whirling method; a 34% hydrochloric acid solution and a 88% sulfuric acid solution at 40-50°C proved over 624 hours the

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S/193/61/000/002/004/009
A005/A004

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

absolute impermeability of the protecting film and the absence of metal corrosion. Tests carried out for 200 hours on 10%-hydrochloric acid and 10%-sulfuric acid under boiling conditions showed no changes of specimens with turbulent sprayed coatings while flame-sprayed coatings showed cracks. When applying polypropylene coatings by the turbulent spraying method, the parts were preheated at 250-300°C and immerged into the whirling powder during 5 - 10 sec; a clear lustrous coating was obtained, whose mechanical properties, such as impact strength and elasticity, were not lower than those of polyethylene coatings.

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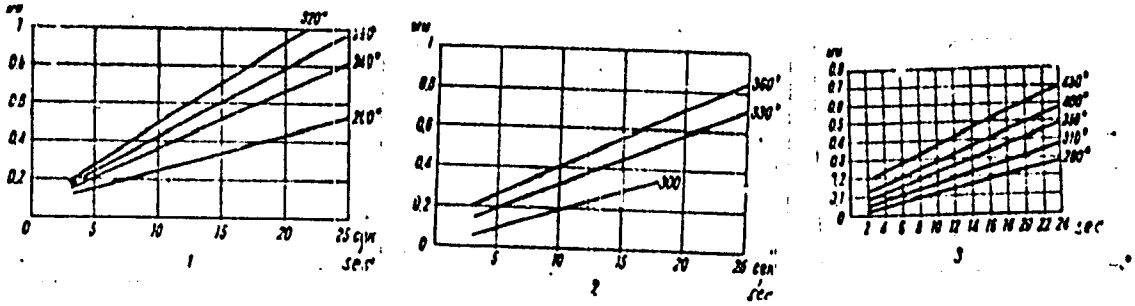
S/193/61/000/002/004/009
A005/A004

Method of Turbulent Spraying of Plastics for the Protection of Metals From Corrosion

Figures: Ratio of component holding time in the boiling powder layer to thickness of coating obtained at various temperatures: 1) material PVD; 2 - material PND; 3 - material polyamide.



Card 5/5

S/852/62/000/000/013/020
B107/B101

AUTHORS: Afanas'yev, P. A., Avgustov, Yu. A.

TITLE: Method of whirl-sintering plastic materials to protect metals against corrosion

SOURCE: Primeneniye polimerov v antikorrozionnoy tekhnike. Ed. by I. Ya. Klinov and P. G. Udyma. Moscow, Mashgiz, 1962. Vses. sovet nauchno-tekhn. obshchestv. 98 - 101

TEXT: The NIIKhIMMASh developed a test apparatus for whirl-sintering. In this technique a pressure of 5 - 6 atm is used to press air or an inert gas through a porous screen. The powdered plastic on the screen behaves like a boiling liquid. Heated objects dipped into it become evenly covered. The most favorable temperature has to be found by experiment. Objects thinner than 1 mm cannot be coated by the whirl-sintering method owing to their low heat content. The device developed by the NIIKhIMMASh has a cross-section of 400 x 400 mm, the screen consists of three glass fabric layers between two brass screens No. 0015. For this method, high-density and low-density polyethylene was used. The former should not be cooled too fast, whereas low-density polyethylene is quenched in cold water. As

Card 1/2

Method of whirl-sintering plastic ... S/852/62/000/000/013/020
B107/B101

the surfaces obtained with high-density polyethylene are not very good it has to be heated afterwards. Polyethylene coatings are resistant to 34 % hydrochloric acid and 88 % sulfuric acid. Impact strength, tensile strength, bending strength, and adhesion of the coatings have been measured [Abstracter's note: Values are not given]. Experiments proved polypropylene to have poorer mechanical properties. In some respects, the method of whirl-sintering is superior to flame spraying: it yields even coatings on metal objects of complicated shapes and a larger output, with no rejects on account of the plastic overheating.

Card 2/2

L 61702-65 EPF(c)/EPR/EWP(j)/EWT(m)/T Pc-4/Pr-4/Ps-4 WW/RM

ACCESSION NR: AP5015966 UR/0314/65/000/006/0033/0036
678.742:620.17

AUTHORS: Avgustov, Yu. A. (Engineer); Chuvayev, V. F. (Engineer); Banzharovskiy, A. T. (Candidate of technical sciences); Zubov, P. I. (Doctor of chemical sciences)

TITLE: Physico-mechanical properties of polyethylene spray coatings

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 6, 1965, 33-36

TOPIC TAGS: plastic, polyethylene, plastic coating

ABSTRACT: Physico-mechanical properties and internal stresses in polyethylene coatings flame-sprayed on sandblasted and degreased steel specimens were studied in an effort to find means for increasing their durability. Internal stresses of the coatings were investigated by the method described by A. T. Banzharovskiy (Vysokomolekulyarnyye soyedineniya, 1960, t. 2, No. 11). They varied erratically with cooling. Thermal treatment of the specimens at 200C increased the coating elasticity, but higher temperatures changed its color. Thermal effect on the magnitude of internal stresses and on the mechanical properties of coating is shown in Figs. 1 and 2 on the Enclosure; according to the curve 1, 200C was the optimal temperature for thermal treatment, resulting in considerable improvement of strength

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L 61702-65

ACCESSION NR: AP5015966

and elasticity of plastic coatings. The study of the variations in the polymer molecular and supermolecular structure revealed its direct relation to the physico-mechanical properties: the strength of the coating grew during the initial heating stage, while further heating caused the destruction of macromolecules and lowering of tensile strength. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 02 SUB CODE: MT

NO REF SOV: 007 OTHER: 001

Card 2/4

L 61702-65

ACCESSION NR: AP5015966

ENCLOSURE: 01

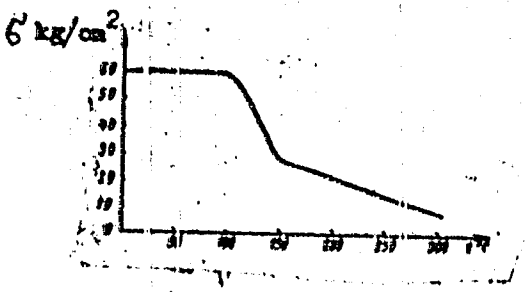

Fig. 1. Effect of thermal treatment temperature t on the magnitude of internal stresses σ in polyethylene coating (duration of treatment--4 hours)

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L 61702-65

ACCESSION NR: AP5015966

ENCLOSURE: 02

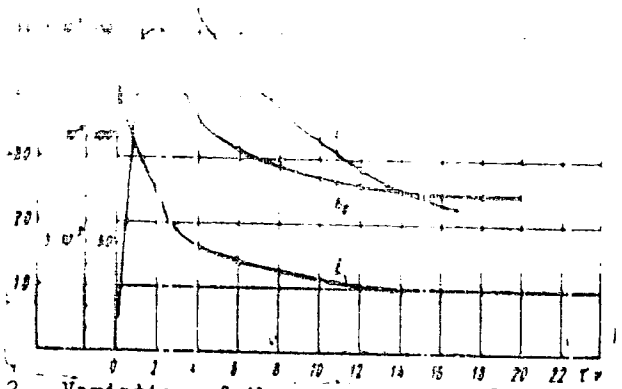

Fig. 2. Variation of the strength limit σ_r, of tensile elongation δ, and elasticity modulus E of polyethylene coating with respect to duration of thermal treatment τ at 200C

Card 4/4

L 23031-65 EPA(s)-2/EWT(m)/EWP(w)/EPF(c)/EWA(d)/EPR/EWP(j)/T/EWP(t)/EWP(b) Pc-4/Pr-4/Ps-4/Pt-10 MJW/JD/WW/DJ/RM

ACCESSION NR: AR4047538 S/0277/64/000/008/0019/0019

SOURCE: Ref. zh. Mashinostr. mat., konstr. i raschet detal. mash. Otd. vyp., Abs. 8.48.115

AUTHOR: Vasil'yev, I. V.; Avgustov, Yu. A.; Yemets, L. F.; Fedosova, T. T.

TITLE: Investigation of the wear of materials by friction in solutions of 65 and 78% sulfuric and 2% hydrochloric acids

CITED SOURCE: Tr. Vses. n.-i. i konstrukt. in-t khim. mashinostr., vyp. 45, 1963, 135-145

TOPIC TAGS: corrosion, friction, sulfuric acid, hydrochloric acid, aggressive medium, wear resistant alloy, wear resistance/ alloy N65M28, teflon 40 D

TRANSLATION: A method for the investigation of friction and wear of materials for fabrication of pieces for sealing and regulating equipment used in aggressive media is described. Tests were conducted on materials with satisfactory corrosion resistance and on

Card 1/2

L 23031-65

ACCESSION NR: AR4047538

metallic samples coated with plastic materials by flame spraying or by coating in suspension. In 65 and 78% solutions of H_2SO_4 with a specific load of 80 kg/cm^2 and a slip speed of 2.15 m/min, the friction pair of alloys [illegible] ... seven words are the literal translation of a passage that does not make sense in the original. [Translator's note] fulfills the conditions of boundary friction. The conditions for boundary friction are based on the speed of formation of protective films on the friction surface. If the speed of formation of the films is less than the speed of their wearing out, or if the films are easily destroyed by friction, there is observed a seizing of materials which causes intensive wear. The same was the case in testing the same alloys in a 2% solution of HCl. By assuring a freer access of the medium to the friction surface by increasing the number of grooves in the movable sample, it is possible to improve friction boundary conditions significantly and to decrease the coefficient of friction. The grooves in the movable sample also assure the removal of wear products from the friction surface causing a polishing effect on the friction surface. In the investigated solutions under the given conditions of friction, the best anti-friction properties were exhibited by Teflon 40 D.

Card 2/2 SUB CODE: MM, OC ENCL: 00

L 10707-63 EPR/EWP(j)/EPF(c)/EWT(m)/EDS--AFFTC/ASD--Ps-4/Pc-4/Pr-4--RM/WW
ACCESSION NR: AP3001646 S/0063/63/008/003/0261/0269

AUTHOR: Avgustov, Yu. A.

TITLE: Plastic coatings

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 8, no. 3, 1963, 261-269

TOPIC TAGS: plastic coatings, corrosion resistance

ABSTRACT: Review article. The author considers methods for applying plastic coatings. These include: flame spraying; dipping in powder; the use of suspensions and dispersions; and methods for specific plastics. Resistant properties of the following plastic coatings are considered: polyvinylisobutylene, polyvinychloride, polyethylene, polyamides, fluorine-substituted ethylene derivatives, epoxidephenol and epoxide-cyanguanidine resins, asbovinyl, faolit and other phenolformaldehyde resins, and furane plastics. Newer coatings are mentioned briefly. Other problems discussed are methods for cleaning metals prior to coating, applying laminated coatings, increasing the plastic's adhesion, and methods for minimizing the effect of differences in linear expansion coefficients. The author outlines problems re-

Card 1/2

ACCESSION NR: AR4015704 S/0081/63/000/023/0602/0602

SOURCE: RZh. Khimiya, Abs 23T324

AUTHOR: Avgustov, Yu. A.; Petrova, A. N.

TITLE: Coating of metals with plastics

CITED SOURCE: Tr. Vses. n.-i. i konstrukt. in-t khim. mashinostr., vy*p. 42, 1962, 88-93

TOPIC TAGS: metal coating, corrosion prevention, plastic, plastic coating, vinyl plastic, polyvinylchloride, polymer, polyethylene

TRANSLATION: To obtain a coating on a thin metal sheet of steel or cast iron, a film of vinyl plastic, a paste of polyvinylchloride and powdered polyethylene are used Before applying the coating, the metal sheet is sandblasted and cleaned with compressed air. An improvement in the technique of application of vinyl plastic films having a thickness of 0.4-0.5 and 0.7-0.9 mm has been developed which shortens the length of the process by a factor of 10. A film of adhesive (13-16% solution of vinyl perchloride in dichloroethane) is applied twice to the cleaned vinyl plastic surface, dried 3-5 minutes in the air and heated for 2-3 second at 175-180C. Simultaneously, the metal sheet is subjected to an analogous procedure,

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ACCESSION NR: AR4015704

but the length of heating is prolonged to 1.5-2 min. and the application of the adhesive is repeated 3 times. The heated vinyl plastic is then applied to the metal sheet situated on a hotplate at 60-70C, and rolled with a steel roller under a pressure of 1 kg/cm^2 for 10-15 sec. The adhesive force, tested on an R-5 rupture strength machine (samples were in the form of "mushrooms"), was 67 kg/cm^2. During application of polyvinylchloride paste, stabilization and plastification of the latter is required, as well as application of an intermediate adhesive layer (the best adhesives are PED-10, PU-2 and vinylperchloride) to the metal sheet to improve the adhesion. The technology of protecting metal sheets with a paste of polyvinylchloride is as follows: preparation of the metal surface; two applications of the adhesive film and, after 3-5 min. in the air, heating in an oven for 3-4 min. at 180-190C; application of polyvinylchloride paste to the metal surface at ~50C with the aid of a paint sprayer or roller, followed by heating for 5-10 min. at 190-200C and cooling in air to 20C. Coating of a cleaned metal sheet, heated to 300-350C, with polyethylene is accomplished by immersion into a whirling polyethylene powder under low pressure for 25-30 sec. followed by fusion of the applied polyethylene at 200C for 5 min. and cooling at 20C. It was established that the chemically most stable coating is one of vinyl plastic, but that the most technological coating, having the best physico-mechanical properties, is one based on polyvinylchloride paste. L. Kotlyarevskaya.

DATE ACQ: 09Jan64 SUB CODE: MM, MT ENCL: 00

Card 2/2

L 30153-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AP6016309 (A) SOURCE CODE: UR/0314/66/000/001/0031/0034

AUTHOR: Avgustov, Yu. A. (Engineer); Senzharovskiy, A. T. (Candidate of technical sciences); Zubov, P. I. (Doctor of chemical sciences)

ORG: none

TITLE: The effect of pigments on the physical and mechanical properties of polyethylene coatings produced by the spraying method

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 1, 1966, 31-34

TOPIC TAGS: plastic coating, polyethylene plastic, pigment, ~~surface property~~ internal stress, solid physical property, mechanical property

ABSTRACT: Internal stresses in polyethylene coatings are probably the result of a difference in the coefficients of thermal expansion of the coating and the support. The present article reports the results of an investigation of the effect of inorganic pigments on the physical and mechanical properties of polyethylene coatings, with the aim of seeking a method of increasing the resistance of these coatings to cracking. The investigations were made with high density Brand E polyethylene (MRTU 6 No. 854-61), unstabilized PNDG, stabilized PNDGS, PNDD

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UDC: 678.742:620.17.001.5

ACC NR: AP6016309

polyethylene (TU GSNX 10.22.59). The pigments used were chromium oxide (GOST 2912-58) and lead oxide (GOST 5539-50). Experimental data, presented in a figure, show that the introduction of [illegible] total pigments into the spraying composition reduces the internal st[illegible]ses by up to 50%. Further addition of pigment has less effect; chromium oxide has a greater effect than lead oxide. The article gives a formula for determining the internal thermal stresses in the coating as a function of the coefficients of linear expansion of the coating and the support. Other properties investigated were the changes in the strength, the adhesion, and the permeability as a result of the addition of pigments. Introduction of 1-2% total chromium oxide into the coating increases the strength by 17-43%; lead oxide has practically no effect. Large amounts of pigments lead to a gradual decrease in the strength. Addition of 1-4% total pigments increases the adhesion of the coating. Larger amounts lower the adhesion. Introduction of up to 2% total chromium oxide does not result in any substantial increase in the vapor permeability. Orig. art. has: 2 formulas and 4 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 010/ OTH REF: 002

Card 2/2 [illegible]

1. AV[illegible], [illegible].

2. USSR (600)

4. Drug Industry

7. The Institute should pay more attention to industry. Apt. delo 2 No. 1, 1953.

9. **Monthly List of Russian Accessions**, Library of Congress, June 1953, Unclassified.

AVGUSTOVSKIY, I., otv. red.; IFTINKA, G.A., rec.izd-va; GOL'BERG, T.M., tekhn. red.

[Standard industrial calculations for the installation of sanitation systems in apartment houses of the 1-464 series] Tipovye proizvodstvennye kal'kuliatsii na montazh sanitarno-tekhnicheskikh sistem v zhilykh domakh serii 1-464. Moskva, Gosstroiizdat, 1963. 21 p. (MIRA 16:12)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.
(Sanitation, Household—Costs)

MAKAROV, A., ved. ispolnitel'; KOZLOVA, L., ispolnitel';
AVGUSTOVSKIY, I., otv. red.; DROZD, T.A., red.;
MIKHEYEVA, A.A., tekhn. red.

[Standard industrial calculations for assembling sanitary engineering systems in series I-335 apartment houses] Tipovye proizvodstvennye kal'kuliatsii na montazh sanitarno-tekhnicheskikh sistem v zhilykh domakh serii I-335. Moskva, Gosstroiizdat, 1963. 21 p. (MIRA 17:2)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

AVGUSTOVSKIY, I., otv. red.; DROZD, T.A., red.izd-va; SHEVCHENKO, T.N., tekhn. red.

[Standard production calculations for assembling sanitary engineering systems in series I-439 A apartment houses] Tipovye proizvodstvennye kal'kuliatsii na montazh sanitarno-tekhnicheskikh sistem v zhilykh domakh serii I-439A. Moskva, Gosstroiizdat, 1963. 23 p. (MIRA 17:4)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

SEREBRYANYY, G.M.; AVGUSTOVSKIY, I.Yu.; RUDAYA, V.V.; GOBERMAN, M.D., otv.red.; PEVZNER, A.S., zav.red.izd-va; OSENKO, L.K., tekhn.red.

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1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva. 2. Normativno-issledovatel'skaya stantsiya No.14 Ministerstva stroitel'stva RSFSR (for Serebryanyy). 3. TSentral'noye normativno-issledovatel'skoye byuro Ministerstva stroitel'stva RSFSR (for Avgustovskiy). 4. TSentral'noye normativno-issledovatel'skoye byuro Ministerstva stroitel'stva elektrostantsiy (for Rudaya).
(Wages) (Pipe)