NESHEV, I.

Short-wave attachment to the ordinary receiver. p. 20.

RADIO. Vol. 5, no. 1, 1956

Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

H

COUNTRY : BULGARIA
CATEGORY : Chemical Technology. Chemical Products and Their Uses. Part 3. Food Industry
ABS. JOUR. : RZKhim., No. 1 1960, No. 2875

AUTHOR : Moshev, I.
INST. :
TITLE : Yield of Meat in Slaughter of Sheep and Goats

ORIG. PUB. : Khranit. prom-st, 1958, 7, No 2, 23-25

ABSTRACT : The yield of meat compared with the live weight of 1,424 sheep (A, B and C grades) and 336 goats (A and B grades) was investigated. It was established that the yield of mutton equaled (average according to grades, in %): 43.26, 39.49 and 37.74, and the yield of goat flesh was 44.15 and 39.64, respectively.--
A. Marin

CARD: 1/1

H-146

KOLEV,T.; NESHEV,,Iord.

Apropos of morbidity with temporary loss of work capacity among Higher Medical Institute workers. Nauch. tr. vissh. med. inst. Sofia 42 no.3:71-82 '63.

1. Predstavena ot prof. d-r. A.Panev, rukovoditel na Katedrata po organizatsiia na zdraveopazvaneto i istoriia na meditsina-ta, Vissh.med. inst., Sofiia.

NESHEV, S.

NESHEV, S. Planning the plant and livestock breeding production. p.4.

Vol. 11, no. 8, Aug. 1956
KOOPERATIVNO ZEMEDELIE
AGRICULTURE
Sofiia, Bulgaria

SO: East European Accession, Vol. 6, No. 3, March 1957

SIMOV, D.; SPASOVA, M.; SIMOVA, Ek.; NESHEVA, Iv.

The N-acylation in the phenothiazine group. Pt. 1. Godishnik khim 53 no.3:87-97 '58/'59 [publ. '59].

CZECHOSLOVAKIA/Human and Animal Physiology.

Abs Jour: Ref Zhur-Biol., No 8, 1958, 36861.

Author : Noshidalova, R., Nouwirt, J., Skorpil, V.
Inst :
Title : The Significance of Glutaminic Acid in the Nervous System.

Orig Pub: Coskosl. psychiatr. 1957, 53, No 2, 95-100.

Abstract: No abstract.

Card : 1/1

NESHIN, A.

Stand for testing cross members and trusses. Stroitel' no.1:12 Ja '60. (MIRA 13:5)

(Trusses--Testing)

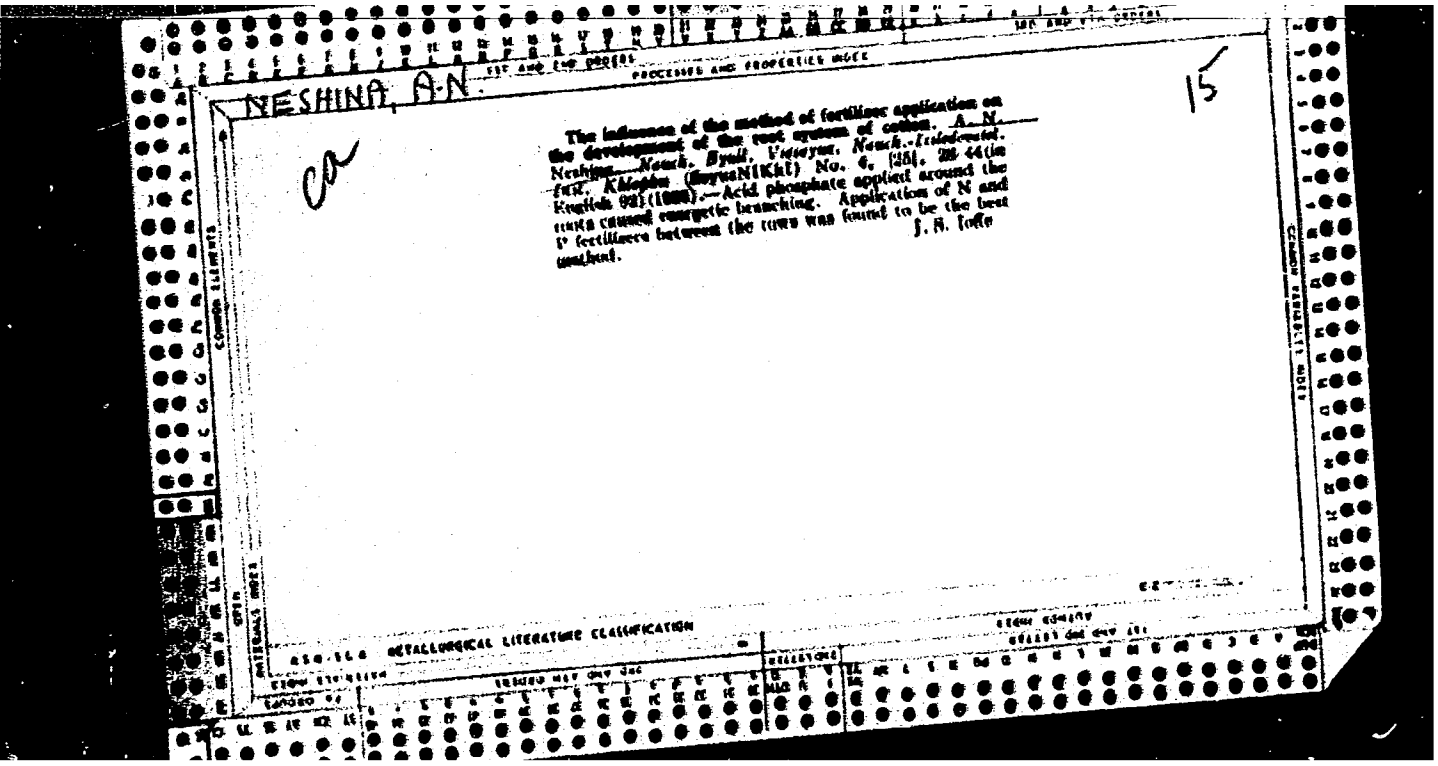
NESHIN, A.M., inzh.

Prolonging the life of vibrators with elastic rollers.
Mekh. stroi 15 no.9:17-18 S '58. (MIRA 11:10)
(Vibrators)

NESHIN, S.

Novgorod power engineers are fulfilling their labor tasks. Zhil.-kom.khoz. 9 no.12:16-17 '59. (MIRA 13:4)

1. Glavnyy inzhener Novgorodskoy elektroseti, g.Novgorod.
(Novgorod--Electric power distribution)



NESHINA, A.N.

15

The influence of the method of fertilizer application on the development of the root system of cotton. A. N. Neshina. *Nauch. Byull. Vsesyuz. Nauch.-Issledovatel. Inst. Khlopka* (Nauch. Bull. All-Union Sci. Research Cotton Inst.) No. 6, 1951. pp 44-46 (in Russian) 931(1000).—Acid phosphate applied around the roots caused energetic branching. Application of N and P fertilizers between the rows was found to be the best method.

J. S. Joffe

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R001136620

NESHINA, A.N.; TODOROV, N.A.

Effect of atmospheric humidity of the fruiting and opening of bolls in the cotton plant. Izv. AN Uz.SSR no.1:35-43 '53. (MIRA 11:3)
(Cotton growing) (Humidity)

NESHINA, A. N.

Neshina, A. N.

"Physiological Investigations of the Cotton Plant in Connection with Water Conditions." Published by the Central Asia State University. Min Higher Education USSR. Central Asia State University imeni V. I. Lenin. Tashkent, 1955. (Dissertation for the Degree of Candidate in Biological Sciences)

SO: Knizhnaya letopis' No. 27, 2 July 1955

M

Country : USSR
Category: Cultivated Plants. Commercial. Oil-Bearing. Sugar-Bearing.

Abs Jour: RZhBiol., No 22, 1958, No 100360

Author : Todorov, N.A.; Noshina, A.N.
Inst : Central Asiatic University
Title : Effect of a Brief Interruption in Illumination at Different Temperatures on the Dropping-Off of Fruit Organs in Cotton Plant.

Orig Pub: Tr. Sredneaz. un-ta, 1957, vyp. 116, 11-21

Abstract: Shutting out light for 2-3 days leads to a mass abscission of ovaries and to the loss of the seeds. Ovaries aged 1-6 days dropped off; ovaries older than 6 days and the buds

Card : 1/2

Abs Jour: RZhBiol., No 22, 1958, No 100360.

[illegible] enrichment of the leaves with sugars reduced the abscission. The higher the temperature of the air during the shading, the more intensively the abscission of the ovary proceeds. Shutting out light for 3 days at the beginning of blossoming produced a decrease in the yield. Shutting out light in the period of maximum blossoming and before the mass abscission of the ovaries had almost no effect on the size of the crop but produced a shifting of mature bolls to the periphery of the bush. -- S.S. Zamotaylov

Card : 2/2

NESHIPORUK, E.I. (Leningrad)

Complexity of networks in certain bas bases containing nontrivalent elements with zero weights. Probl.kib. no.8:123-160 '62. (MIRA 16:4)
(Automatic control) (Cybernetics)

NESHITIN, M.D.; BROZIN, A.A.

Accuracy in lining vertical mine shafts. Shakht. stroi. 6 no.7:10-12 Jl '62. (MIRA 15:7)

1. Glavnyy marksheyder kombinata Donetskshakhtostroy (for Neshitin). 2. Glavnyy marksheyder tresta Donetskshakhtoprokhodka (for Brozin).

(Mine surveying) (Shaft sinking)

NESHITOV, G. A.

Tools

Planning in tool shops. Sel'khoz mashina No. 6, 1952

9. Monthly List of Russian Accessions, Library of Congress, September 1952. Unclassified.

Submitted : .....

NESHITOV, G.A.

25(5) PHASE I BOOK EXPLOITATION SOV/2934

Burmistrov, Nikolay Semenovich, (Deceased), Mikhail Aleksandrovich Galkin, Pavel Fedorovich Matveyev, Grigoriy Akimovich Neshitov, and Nikolay Georgiyevich Ozhimkov

Planirovaniye vspomogatel'nykh tsekhov mashinostroitel'nogo zavoda (Planning the Setup of Auxiliary Shops at a Machine-Building Plant) 2nd ed. Moscow, Mashgiz, 1958. 278 p. 4,000 copies printed.

Ed.: N.S. Burmistrov, Engineer (Deceased); Reviewers: B.V. Voskresenskiy, Economist; P.G. Kalinin, Economist; and A.I. Shuster, Economist; Ed. of Publishing House: A.A. Salyanskiy; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on the Economics and Organization of Production: T.D. Saksaganskiy.

PURPOSE: This book is intended for employees at machine-building plants who are engaged in planning

COVERAGE: The book deals with problems in planning the setup and operations of various auxiliary shops and services at a

Card 1/7

machine-building plant. The organization of work in such auxiliary units as the machine-repair shop, the tool shop, the industrial power plant, the transportation service, etc. is reviewed, and suggestions are made for improving their labor productivity. Production and maintenance costs of auxiliary shops and units are analyzed, and possibilities of reducing cost investigated. Preparation of estimated expenditures and of monthly financial statements showing results of operations are discussed. The operation of each auxiliary shop or service of the plant is analyzed. Several chapters are written by different authors. No personalities are mentioned. No references are given.

TABLE OF CONTENTS:

Planning the Setup (Cont.) SOV/2934

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Planning the Setup (Cont.)

Planning the Setup (Cont.) SOV/2934

AVAILABLE: Library of Congress

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3-21-60

Card 7/7

MISHITOV, Grigoriy Akimovich; PANTER, B.Ya., retsenzent; PROTSEROV, S.A., retsenzent; ROZENBLIT, Ya.M., red.; TKACHUK, A.I., red.izd-va; MODEL', B.I., tekhn.red.

[Production analysis of plants; practices of a plant] Analiz proizvodstvennoi deiatel'nosti zavoda; iz opyta raboty zavoda. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 116 p. (MIRA 12:5)
(Machinery industry)

MINSKY, YE.M.; NESMEYN, M.A. (Moscow)

"An experimental investigation of unsteady non-linear flow through porous media".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

L 4237-66 EWT(m)/EPA(w)-2/EWA(m)-2 LJP(c) GS S/0000/64/000/000/1065/1072 51 B+1
ACCESSION NR: AT5007979

AUTHOR: Abramyan, Ye. A.; Bender, I. Ye.; Bondarenko, L. V.; Budker, G. I.; Glagolev, G. B.; Kadymov, A. Kh.; Neshkov, I. N.; Naumov, A. A.; Pal'chikov, V. Ye.; Panasyuk, V. S.; Popov, S. G.; Protopopov, I. Ya.; Radionov, Yu. I.; Samoylov, I. M.; Skrinskiy, A. N.; Yudin, L. I.; Kan'kov, N. G.; Mostovoy, Yu. A.; Nezhevenko, O. A.; Ostreyko, G. N.; Petrov, V. V.; Sokolov, A. A.; Timoshin, I. Ya.

TITLE: Work on the strong-current accelerators of the Nuclear Physics Institute, SO AN SSSR. (I) Strong-current pulse accelerators with spiral storage of the electrons. (II) Strong-current accelerators with one-revolution capture of the injected electrons

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 1065-1072

TOPIC TAGS: high energy accelerator, electron accelerator, electron beam, betatron, plasma

ABSTRACT: The work on developing strong-current electron ring accelerators was begun in 1965 by the authors at the Nuclear Physics Institute, Siberian Department, Academy of Sciences SSSR, with the object of studying the possibility of

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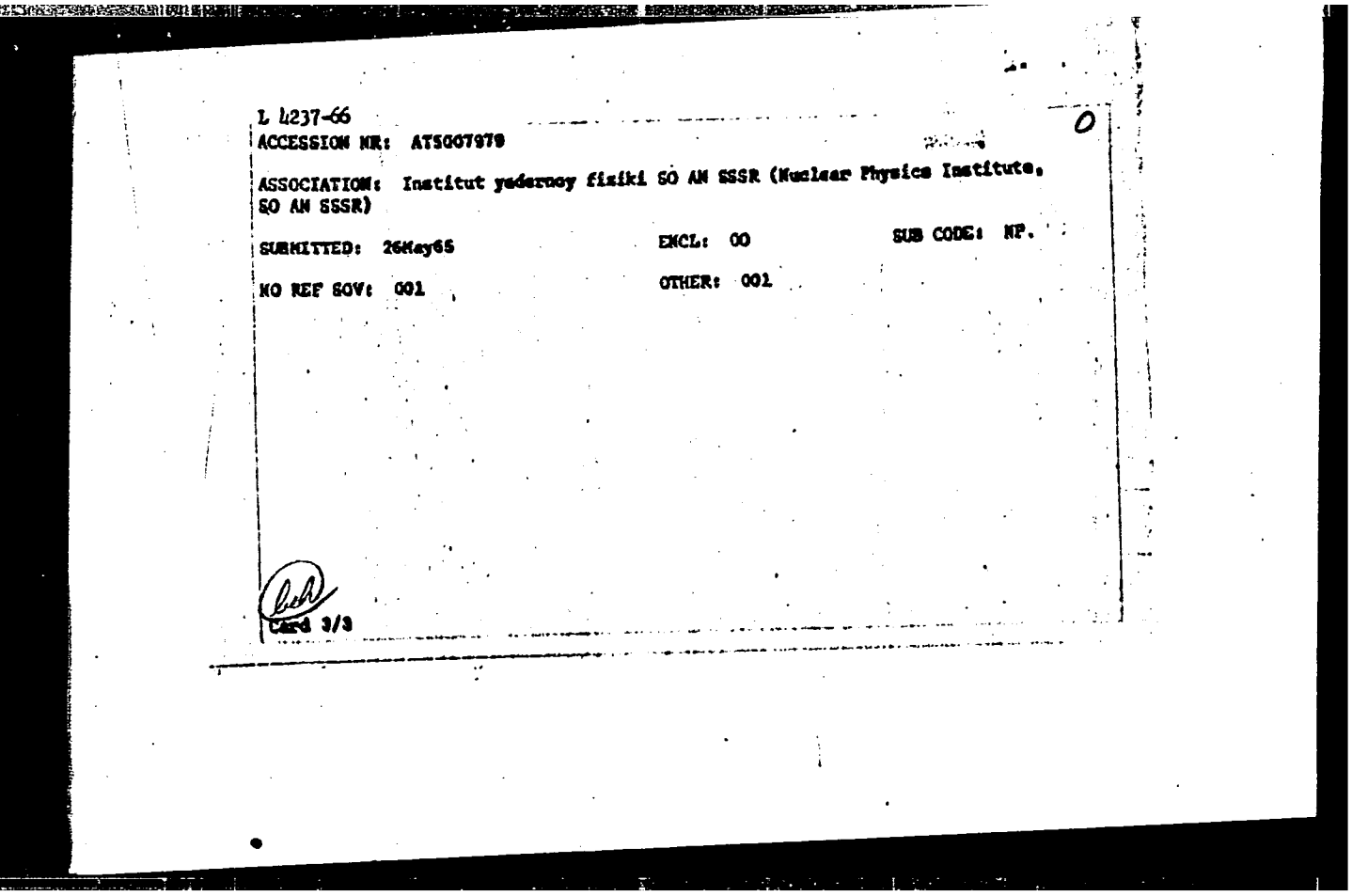
L 4237-66

ACCESSION NR: AT5007979

O

forming relativistic stabilized beams. In the laboratories of the Institute experimental studies were carried out on the four methods for obtaining large ring currents of relativistic electrons: (1) spiral method of storing the electrons in installations of the betatron type with subsequent betatron synchrotron acceleration (Budker G. I. CERN Symposium 1, 68 (1956); (2) obtaining of limiting electron currents by means of the injection of electrons from a strong-current linear accelerator into a ring chamber of large aperture with subsequent synchrotron acceleration; (3) storage of electrons in tracks (parking orbits) with constant magnetic field by means of the multiple injection of electrons from another less strong-current accelerator; this method is utilized for the storage of electrons and positrons in experiments with colliding beams (expounded in detail by G. I. Budker in the present collection, p. 274); (4) obtaining of large electron currents by means of the acceleration of electrons by a ring plasma. The present report discusses the first two methods under the following topics: (I) pulsed iron-less betatron with preliminary charge storage (B-2 device); strong-current pulsed synchrotron E-2S; pulsed strong-current betatron with spiral storage (B-3 device). (II) iron-less one-turn strong-current synchrotron (BSB); strong-current pulsed synchrotron E-3M. Orig. art. has: 7 figures.

Card 2/3



L 4237-66

ACCESSION NR: AT5007979

ASSOCIATION: Institut yadernoy fiziki SO AN SSSR (Nuclear Physics Institute, SO AN SSSR)

SUBMITTED: 26May65 ENCL: 00 SUB CODE: NP.

NO REF SOV: 001 OTHER: 002

Card 3/3

NESHKOV, K. I.

NESHKOV, K. I. -- "Inequalities in the Mathematics Course of the Intermediate School." Moscow, 1955. (Dissertation for the Degree of Candidate in Pedagogical Sciences).

So.: Knizhnaya Litopis', No. 7, 1956.

ASHKINUZE, V.G., nauchnyy sotrudnik; GIBSH, I.A., nauchnyy sotrudnik; MASLOVA, G.G., nauchnyy sotrudnik; MESHKOV, K.I., nauchnyy sotrudnik; NIKITIN, N.N., nauchnyy sotrudnik; SEMUSHIN, A.D., nauchnyy sotrudnik; FETISOV, A.I., nauchnyy sotrudnik; KOSTELOVSKIY, V.A., red.; TARASOVA, V.V., tekhn.red.

[Teaching mathematics in schools in the 1959/60 school year] O prepodavanii matematiki v shkole v 1959/60 uchebnom godu. Pod red. A.D.Semushina. Moskva, 1959. 135 p. (MIRA 13:5)

1. Akademiya pedagogicheskikh nauk RSFSR, Moscow. Institut metodov obucheniya. 2. Sektor metodiki prepodavaniya matematiki Instituta metodov obucheniya Akademii pedagogicheskikh nauk RSFSR (for all except Kostelovskiy, Tarasova).
(Mathematics--Study and teaching)

NESHKOV, K.I. (Moskva)

Educational conferences at the Academy of Pedagogical Sciences of the R.S.F.S.R. Mat. v shkole no.3:87-88 My-Je '59. (MIRA 12:9)

(Mathematics)

NESHKOV, K.I. (Moskva)

Rule for the rounding off of numbers. Mat.v shkole no.4: 27-31 Jl-Ag '59. (MIRA 12:11)
(Arithmetic--Study and teaching)

NESHKOV, K.I. (Moskva)

Approximate computation in the 6th grade course (from practical experience). Mat.v shkole no.4:26-33 Jl-Ag '60. (MIRA 13:9)
(Approximate computation)

NESHKOV, Konstantin Ivanovich; VIKULINA, E.K., red.; TARASOVA, V.V., tekhn. red.

[System of teaching an arithmetic course in the 5th grade] Sistema izlozheniia kursa arifmetiki v V klasse. Moskva, Izd-vo APN RSFSR, 1963. 293 p. (MIRA 16:7)
(Arithmetic--Study and teaching)

NESHKOV, T.

"Using Plexiglas in making amateur radio receivers."

p. 30 (Radio I Televiziia) Vol. 6, no. 12, 1957
Sofiia, Bulgaria

SO: Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 4., April 1958

L 29776-66 EWT(m)/EWP(t)/ETI IJP(c) JD
ACC NR: AP6015069 (A) SOURCE CODE: UR/0363/66/002/005/0855/0863 63

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

UDC: 546.261:669.018.5

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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

Category : USSR/Solid State Physics - Systems E-4

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1158

Author : Samsonov, G.V., Neshpor, V.S., Lange, L.V.
Inst : Moscow Institute for Nonferrous Metals and Gold
Title : Laws of Formation of Binary Alloys of Titanium

Orig Pub : Metallovedeniye i obrabotka metallov, 1956, No 1, 30-39

Abstract : When Ti interacts with metals that have a similar electron shell structure and a small difference in atomic diameters (not more than 18%), the additive (Zr) may have an unlimited solubility in the α and β modification of Ti, or else continuous series of solid solutions are formed with β titanium with a limited solubility in α Ti (Mo, V, Nb, Ta). Elements having a different electron-shell character and a different atomic diameter interact with titanium to form solid solutions with a limited solubility in the β and α titanium and with diagrams of state with eutectic or eutectoid transformations (Mn, Fe, Cr, Si, Ni, Cu) or with peritectic or peritectoid transformations (C, N, Al). When Ti is smelted with elements of the transition groups, one observes an expansion in the region of the solid solutions with α-Ti.

Card : 1/1

Review of the Binary Systems of Titanium and Suggestions for Their Classification. G. V. Samsonov, V. S. Neshpor, and L. V. Lango (*Metallovedenie i Obrabotka Metallov*, 1954, (1), 51–59).—[In Russian]. Reviews the equilibrium diagrams published for binary systems of Ti with Cu, Ag, Au, Be, Mg, B, Al, C, Si, Ge, Sn, Pb, Zr, N, P, V, Nb, Ta, O, S, Se, Te, Cr, Mo, W, U, H, Mn, Fe, Co, and Ni, and the suggestions that have been made for classifying them. 32 ref.
—G. V. E. T.

NESHPOR, V.S.

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6357

Author : Samsonov, G.V., Neshpor, V.S.
Inst : Moscow Institute of Nonferrous Metals and Gold
Title : Superconductivity of Barides, Carbides, Nitrides, and Silicides of Transition Metals.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 6, 1143

Abstract : From an analysis of the behavior of the transition points T_k in the superconducting state of compounds of the following series: TiC-TiN, VC-VN, and ZrB-ZrC-ZrN, the author assumes that the values of T_k is related to the distribution of the electron density, i.e., it depends on the accepting ability 1/(Nn) of the atom of the transition metal (Referat Zhur Fizika, 1954, 10208) and on the ionization potential φ of the metalloid. The most favorable ratio of the values 1/(Nn) and φ is found apparently in the Nb and Ta compounds. The sharp reduction in the number 1/(Nn) for Ti, Zr, V, and Hf compared with Ta, Nb, W, and Mo is accompanied by a sharp increase in

Card : 1/2

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6357

the values of T_k. In many cases the value of T_k increases with increasing content of metalloid in the phases, for example; Nb_2N -- 9.5°K, NbN -- 15°K; Mo_2C -- 2.9°K, MoC -- 8°K etc. The relatively low values of T_k for barides compared with carbides and nitrides are due apparently to the small frectionof electrons, capable of making up the electron deficiencies of the atoms of the transition metals. Silicon compounds, which have still a lower ionization potential, should occupy a place in the MeSi -- MeB -- MeC -- MeN series, which is indeed confirmed in most cases.

Card : 2/2

NESHPOR, V.S.

109-5-14/22

AUTHOR SAMSONOV G.V., NESHPOR V.S., KUDINTSEVA G.A.

TITLE On the Relationship Between Thermoemission Constants of Transitive Metals(and Their Compounds with Several Metalloids)and Electronic Structure.
(O svyazi termoemissionnykh postoyannykh perekhodnykh metallov(i ikh soyedineniy s nekotorymi metalloidami)s elektronnoy strukturoy - Russian)

PERIODICAL Radiotekhnika i Elektronika, 1957, Vol 2, Nr 5, pp 631-636 (U.S.S.R.)

ABSTRACT An attempt is made here to determine the relation between the electronic work function in thermoemission and the electronic structure of transitive metals (and their compounds with boron ,carbon and nitrogen). It is shown that the work function depends on the atomic structure of the metal and decreases with decreasing degree of screening of the electrons of incompletely occupied d-atom shells of transitive metals. The work function can be brought into connection with the quantity of dispersive power of the atoms of transitive metals which are characterized by the criterion 1/Nn. N - chief quantum figure; n - the number of electrons in the incompletely occupied d-shell, it decreases with increasing 1/Nn. In metalloid compounds of transitive metals with boron , c arbon and nitrogen the work function should increase with increasing 1/Nn for the corresponding transitive metals.This is confirmed in the case of borides,but in the case of carbides and nitrides it can not yet be considered to be an established fact. The ionizing potential of the metalloid atom

Card 1/2

On the Relationship Between Thermoemission Constants of 109-5-14/22
Transitive Metals (and Their Compounds with Several Metalloids) and
Electronic Structure.

exerts considerable influence on the amount of the work function
of metalloid compounds. A reduction of the work function is to be
expected in the MeB_2-MeC-MeN series, where Me is a transitive metal
of groups IVa, Va, or VIa. The work function is in most cases smal-
ler in the case of metalloid compounds th an in that of the corres-
ponding metals.
(1 table, 4 illustrations, 6 Slavic references).

ASSOCIATION Not Given.
PRESENTED BY
SUBMITTED 25.6.1956
AVAILABLE Library of Congress.
Card 2/2

AUTHOR: Neshpor, V.S. and Samsonov, G.V.

TITLE: On the problem of brittleness of metalloids compounds. (K voprosu o khrupkosti metallopodobnykh soyedineniy.)

PERIODICAL: "Fizika Metallov i Metallovedenie," (Physics of Metals and Metallurgy), 1957, Vol.IV, No.1 (10), pp.181-183 (U.S.S.R.)

ABSTRACT: The coefficients of linear expansion of a number of metalloids were determined and their modulus of elasticity was estimated on the basis of a formula proposed by Ya. I. Frenkel' (3). In a table, p.181, the coefficients of linear expansion, the elasticity moduli, the mean square displacements of the molecules in the crystals and the brittleness of these compounds are given, some of the data being based on information published in literature. The following compounds were investigated by the authors: Mo_2C WC, TiC, ZrB_2, TiB_2, ZrC, TiN, CrB_2. The values given in the table for W_2C, NbC, TaC and VC are those given by Koster (Zs. f. Metallkunde, 1948, 39, 111).
1 table, 1 graph, 7 references, 3 of which are Russian.

Institute of Metal Ceramics of Special Alloys, Ac.Sc. Ukraine: Moscow Institute of non-ferrous metals and gold imeni M.I. Kalinin. Recd. Mar.22, 1956.

NESHPOR, V. S.

21-5-13/26

AUTHORS: Neshpor, V.S. and Samsonov, G.V.(H.V.)

TITLE: New Borides of Rare-Earth Elements (Novyye boridy redkozemel'-nykh elementov)

PERIODICAL: Dopovidi Akademii Nauk Ukrains'koi RSR, 1957, Nr 5, pp. 478-479 (USSR)

ABSTRACT: The authors obtained the borides of dysprosium, holmium and lutecium by means of the vacuum-thermal method. They were subjected to X-ray and chemical analyses. Roentgenograms of all these compounds are completely similar and indicate the presence in each of them of two phases: cubic and tetragonal so that the composition of these borides is as follows: DyB_6, DyB_4, HoB_6, HoB_4, LuB_6 and LuB_4. The constants of their lattices are cited in Table 1 of the article. The intensities of the lines of the two phases in the roentgenograms are approximately equal; most of the lines are ascribed to the phase of MeB_4. The article contains 1 roentgenogram, 1 table and 6 references, 2 of which are Slavic.

Card 1/2

21-5-13/26

New Borides of Rare-Earth Elements

ASSOCIATION: Institute of Metalloceramics and Special Alloys of the AN Ukrainian SSR (Instytut metalokeramiky i spetssplaviv AN URSR)

PRESENTED: By V.N. Svechnikov (V.M. Svyechnikov), Member of the AN Ukrainian SSR

SUBMITTED: 4 March 1957

AVAILABLE: Library of Congress

Card 2/2

Neshpor, V.S.

18(0,7) PHASE I BOOK EXPLOITATION SOV/2170

Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov

Voprosy poroshkovoy metallurgii i prochnosti materialov, vyp. 5 (Problems in Powder Metallurgy and Strength of Materials, Nr 5) Kiyev, Izd-vo AN USSR, 1958. 172p. 2,000 copies printed.

Ed. of Publishing House: Ya. A. Samokhvalov; Tech. Ed.: V.Ye. Sklyarova; Editorial Board: I.N. Frantsevich (Resp. Ed.), I.M. Fedorchenko, G.S. Pisarenko, G.V.Samsonov, and V.V. Grigor'yeva.

PURPOSE: This collection of articles is intended for a wide circle of scientists and engineers in the research and production of powder metallurgy. It may also be useful to advanced students of metallurgical institutes.

COVERAGE: This collection of articles describes the results of investigations made at the Institut metallo keramikii spetsial'nykh splavov, AN USSR (Institute of Powder Metallurgy and Special Alloys, Academy of Sciences, Ukrainian SSR). The physical and chem-

Card 1/6
3

ical properties of materials used in powder metallurgy are discussed. Materials described as new, production processes, and methods and results of mechanical testing are described. No personalities are mentioned. References follow each article.

TABLE OF CONTENTS:

SAMSONOV, G.V.; NESHPOR, V.S.

Theoretical assumptions on the structure of heat resistant materials based on metallic compounds [with summary in English]. Inzh.-fiz.zhur. 1 no.8:30-38 Ag '58. (MIRA 11:8)

1.Institut metallokeramiki i spetssplavov AN USSR, Kiyev.
(Refractory materials)

AUTHORS: Samsonov, G. V., ~~Neshpor, V. S.,~~ Yermakova, V. A. 78-3-4-7/38

TITLE: Investigations of the Properties of the Alloys of the System Niobium-Silicon (Issledovaniye svoystv splavov sistemy niobiy-kremniy)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 868-878 (USSR)

ABSTRACT: The phase composition of the alloys in the system niobium--silicon in concentrations of from 0 to 100 atom% was investigated by radiographic and metallographic methods. Three intermediate compounds were found:

1.-Nb_4Si with hexagonal lattice with the following parameter: a = 3,59 Å, c = 4,46 Å.

2.-Nb_5Si_3 in three modifications, tetragonal α- and β-modifications with parameters a = 6,56 Å and c = 11,86 Å and a = 10,00 Å and c = 5,07 Å, an hexagonal γ-modification with parameters a = 7,52 Å and c = 5,24 Å.

3.-$NbSi_2$ with hexagonal structure a = 4,78 Å and c = 6,56 Å.

The melting points of some alloys were investigated. It was found on this occasion that the compound Nb_4Si has a congruent melting point.

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Investigations of the Properties of the Alloys of the System Niobium-Silicon

78-3-4-7/38

The investigations of the electric conductivity of the alloys of niobium and silicon have three specific points in the phase diagram at 20, 37,5 and 66,6 atom% silicon.
Also the stability of the alloys against oxidation in air at 1000°C was investigated. The alloys are not resistant to corrosion.
Based on the investigations carried out as well as on the analyses of the alloys the phase diagrams of niobium and silicon were constructed.
There are 11 figures, 5 tables, and 18 references, 2 of which are Soviet.

ASSOCIATION: Institut metallokeramiki i spetsialnykh splavov Akademii nauk USSR (Institute for Metalloceramics and Special Alloys, AS UkrSSR)

SUBMITTED: June 25, 1957

Card 2/2

21-58-7-13/27

AUTHORS: Koval'chenko, M.S., Neshpor, V.S. and Samsonov, G.V.

TITLE: Investigation of Zirconium Boride - Molybdenum Alloys (Issledovaniye spavov borida tsirkoniya s molibdenom)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, 1958, Nr 7, pp 740-742 (USSR)

ABSTRACT: The properties of ZrB_2 - Mo alloys obtained by sintering were investigated. On the basis of the results of visual thermal analysis, metallographic and roentgenographic studies. shrinkage curves, and measuring the macro- and microhardness, a hypothetical diagram of the ZrB_2-Mo system state was composed. The existence of the triple boride Mo_2ZrB_2 was discovered in the system. Conditions for the hot pressing of zirconium boride alloys with molybdenum were studied at molybdenum contents of 5; 40 and 60 molecular per cent. Sufficiently compact alloys were obtained on pressing under a specific pressure of 260 kg/sq cm and temperatures from 2,000 to 2,100°C. There is 1 graph and 10 references, 7 of which are Soviet, and 3 American.

Card 1/2

21-58-7-13/27

Investigation of Zirconium Boride - Molybdenum Alloys

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute of Metalloceramics and Special Alloys of the AS UkrSSR)

PRESENTED: By Member of the AS UkrSSR, V.N. Svechnikov

SUBMITTED: January 23, 1958

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

1. Zirconium boride-molybdenum alloys--Properties
2. Zirconium boride-molybdenum alloys--Sintering

Card 2/2

SOV-21-58-8-9/27

AUTHORS: Samsonov, G.V., Neshpor, V.S., Strel'nikova, N.S.

TITLE: Magnetic Susceptibility of Solid Solutions of Some Metal-Like Compounds (Magnitnaya vospriimchivost' tverdykh rastvorov nekotorykh metallopodobnykh soyedineniy)

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, 1958, Nr 8, pp 838-840 (USSR)

ABSTRACT: Investigations of magnetic susceptibility of metal-like compounds can contribute to an explanation of the nature of chemical bounds in these phases. The authors investigated the magnetic susceptibility of the single-phase solid solutions of the following metal-like compounds: ZrC-NbC; TaC-NbC; TaB_2-ZrB_2 and TiC-TiN. Since the measurements of absolute susceptibility were difficult due to experimental conditions, the values of relative susceptibility were determined by taking that of one of the components for unity. The results of experiments are presented in graphical form showing the dependence of magnetic susceptibility on the concentration. The two curves for the alloys NbC-ZrC and TaB_2-ZrB_2 have peaks, whereas the curve for NbC-TaC does not possess a peak. In

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Magnetic Susceptibility of Solid Solutions of Some Metal-Like Compounds

the alloy TiC-TiN, a sharp fall of the magnetic susceptibility is observed with increasing TiC concentration. The authors attempt to interpret theoretically these experimental data. There are 2 graphs and 5 references, 3 of which are Soviet, 1 German and 1 Polish.

ASSOCIATION: Institut metallokeramiki i spetssplavov AN UkrSSR (Institute of Metalloceramics and Special Alloys of the AS UkrSSR)

PRESENTED: By Member of the AS UkrSSR, V.N. Svechnikov

SUBMITTED: February 26, 1958

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

1. Intermetallic compounds--Magnetic properties 2. Intermetallic compounds--Phase studies

NESHPOR, V. S.

131-1-7/14

AUTHORS: Samsonov, G. V., Neshpor, V. S.

TITLE: Production, Properties and Technical Use of Molybdenum-Disilicide (Polucheniye, svoystva i tekhnicheskoye primeneniye disilitsida molibdena)

PERIODICAL: Ogneupory, 1958, 23 Nr 1, pp. 28 - 35 (USSR)

ABSTRACT: This is one of the most important difficultly fusible compounds ($MoSi_2$) which in recent years are used at high temperatures. The extremely high resistance to the influence of atmospheric oxygen at a temperature of up to 1700°C and other agressive gases, as well as to acids and molten metals is to be considered its basic property. Its properties and behavior at different temperatures are described in detail; K. I. Portnyy also participated in these tests. The behavior of $MoSi_2$ in the atmosphere of various gases and in the air is represented by the curves of figures 1 and 2 and then explained. Molybdenum-disilicide is resistant to the action of the following molten metals: sodium, lead, bismuth, tin, mercury and other metals which do not form disilicides. Table 1 shows the resistance of $MoSi_2$ to the oxidation in an oxygen flow at 1200°C after previous heating in metal melts. $MoSi_2$ is inclined to creeping and is not sufficiently resistant to heat shocks (see

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Production, Properties and Technical Use of Molybdenum-Disilicide

table 2). The other mechanical and physical properties of $MoSi_2$ are enumerated in detail and explained and its use at high temperature is described in detail. Figure 3 shows a molybdenum heater with and without a $MoSi_2$-covering. There are many possibilities of the preparation of $MoSi_2$-powder , the simplest one consists of a direct combination of molybdenum with silicon: $Mo + 2Si = MoSi_2$. The tests of a direct synthesis were performed together with N. M. Popova. Up to a temperature of 1100°C the tests were performed in a laboratory furnace TK 30/200 in an argon atmosphere (figure 4), at higher temperatures in a vacuum resistance furnace. In the Laboratory of the Institute for Powder Metallurgy and Special Alloys AN Ukrainian SSR $MoSi_2$ was produced at a temperature of 1000°C and one hour halt. I. D. Radomysel'skiy also participated in the experiments. Figure 5 records the porosity dependence of the test samples on the sintering temperature and figure 6 that on the time of sintering. Figure 7 shows products of molybdenum-disilicide of the firm Plansee in Austria. Conclusions:

a) $MoSi_2$ is one of the compounds most resistant to scale and chemical influences, which property is connected with its high thermal conductivity, hardness and stability. It is used for the production of refractory products, heatproof alloys and covers for molybdenum products and for the soldering of ceramics with metals;

Production, Properties and Technical Use of Molybdenum-Disilicide

b) the most suitable method of the production of $MoSi_2$-powder consists in the heating of briquettes of a mixture of molybdenum- and silicon-powder in the course of 1 hour at a temperature of 1000°C and the manufacture of products by hot pressing of $MoSi_2$-powder at a temperature of 1900°C. There are 9 figures, 2 tables, and 27 references, 9 of which are Slavic, 7 German and 10 English.

ASSOCIATION: Institute for Powder Metallurgy and Special Alloys AN Ukrainian SSR
(Institut metallokeramiki i spetsial'nykh splavov AN USSR)

AVAILABLE: Library of Congress

1. Compounds-Properties 2. Compounds-Production
3. Compounds-Application

KOLOMOYETS, N.V.; NESHPOR, V.S.; SAMSONOV, G.V.; SEMENKOVICH, S.A.

Thermoelectric properties of certain metal like compounds.
Zhur. tekh. fiz. 28 no.11:2382-2389 N '58. (MIRA 12:1)
(Carbides) (Borides) (Thermoelectricity)

KOVAL'CHENKO, M.S.; NESHPOR, V.S.; SAMSONOV, G.V.

Condition for formation of lanthanum carbide. Zhur. prikl. khim. 31 no.9:1427-1429 S '58. (MIRA 11:10)
(Lathanium carbide)

AUTHORS: Neshpor, V. S., Samsonov, G. V. 76-32-6-21/46

TITLE: New Borides of Rare Earth Metals (Novyye boridy redkozemel'nykh metallov)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6, pp 1328-1332 (USSR)

ABSTRACT: After a discussion of papers and discoveries in this field this paper gives the results of the measurements as well as the production of borides from Dy_2O_3, Ho_2O_3, Lu_2O_3, Gd_2O_3 and Er_2O_3. The production was carried out from the mentioned oxides with boron carbide at 1400-1600° C in vacuum furnaces; the phases of the obtained products were identified and the corresponding formulae were determined as follows: GdB_6, DyB_6, HoB_6, ErB_6, LuB_6 and GdB_4, DyB_4, HoB_4, ErB_4, LuB_4. The authors found that the metal is in bivalent form in the case of CaB_6, BaB_6, SrB_6, YB_6 and ErB_6, while it is in trivalent form in the other hexaborides of the rare earth metals. This was determined from the obtained values of the lattice parameters of hexaborides as well

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New Borides of Rare Earth Metals SOV/76-32-6-21/46

as from the lenghts of the bindings Me-Me, Me-B, and B-B calculated herefrom. It was noticed that the Me-Me and Me-B bindings decrease in every period at the transition from the bi- to the trivalent metal, and that the weakening of the bond in hexaborides can be explained by an increased concentration of the free electrons which weaken the lattice. The stability of the lattice MeB_6 is due to an especially strong binding of the boron atoms. The assumption is made that the formation of a hexaboride is possible also with elements with a higher ionization potential; this is, however, connected with difficulties as was shown by the experiments for the formation of silicon hexaboride. There are 1 figure, 3 tables, and 21 references, 11 of which are Soviet.

ASSOCIATION: Akademiya nauk, USSR Institut metallokeramiki i spetssplavov, Kiyev (Kiyev, Institute of Metal Ceramics and Special Alloys, AS Ukr[illegible] SSR)

SUBMITTED: February 14, 1957

Card 2/3

NESHPOR U.S.

20-3-27/59

AUTHORS: Neshpor, V. S., Paderno, Yu. B., Samsonov, G. V.

TITLE: On Rhenium Borides (O boridakh reniya).

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 3, pp. 515-516 (USSR)

ABSTRACT: In the present work the phase composition of Re-B alloys was investigated as there is practically no reference to be found in publications (with the exception of a short mentioning in ref. 1). These compounds are first of all of interest as they might be similar to the stable, difficultly smeltable and hard tungsten borides (ref. 2) as well as to the unstable manganese borides. Alloys were investigated which had been calculated with a view of producing compounds, existing in the systems of metals similar to rhenium as regards their electron structure and their properties. They were

Re_4B, Re_2B, Re_3B_2, ReB, Re_3B_4, Re_2B_3, ReB_2 and Re_2B_5.

The alloys were produced by sintering pressed powder mixtures (ref. 4) at 1900° for two hours. The radiograms of the alloys taken by copper radiation are given in fig.1. No

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On Rhenium Borides

satisfactory coincidence of the structure of the phases produced with the known boride phases was obtained. Beginning with composition Re_4B a gradual lattice transformation of rhenium is observed. Besides the considerably washed lines of rhenium a certain amount of additional weak lines appears which also appear washed. With a further increase of the borine content to 33 atomic-% these lines become clearer. A further increase of the content of borine brings about a gradual change of the radiogram. Beginning with 50 atomic-% all radiograms look the same. Although no essential changes of structure are to be noticed with the transition from one alloy to the other the radiograms of the alloy-samples far from each other are markedly different. In system Re-B two phases can be assumed: γ within the range of 20-35 atomic-% and γ' within the range of alloys with more than 40 atomic-%.B. The last phase could not be identified hitherto. The alloy with 33,3 atomic-% B immediately after sintering had a structure corresponding to the ϵ-phases of Me_2B_5. After storing in the air for 1 month it passed over to the γ'-phase, however.

SOV/2o-122-6-18/49

9(3), 24(3)
AUTHORS: Samsonov, G. V., Neshpor, V. S.

TITLE: On the Relationship Between the Work Electron Yield From Hexaborides of Alkali-Earth and Rare-Earth Metals and Their Electron Structure. (O svyazi raboty vykhoda elektronov iz geksaboridov shchelochno-i redkozemel'nykh metallov s ikh elektronnym stroyeniyem)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1o21-1o23 (USSR)

ABSTRACT: Recently, the parameters of the thermoelectronic emission of nearly all hexaborides of earth-alkali metals and rare earth metals have been investigated. A diagram (Ref 4) shows the dependence of the work function of hexaborides of rare earth metals MeB_6 on the nuclear charge number of their metal components (according to data obtained by G. A. Kudintseva and B. M. Tsarev). The character of this dependence can be explaind satisfactorily by the theory of the atomic structure of rare earth metals developed by M. A. Yel'yashevich (Ref 5) as well as by the theories developed by various authors concerning hexaboride electron structure. The production of hexa-

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On the Relationship Between the Work of Electron Yield From Hexaborides of Alkali-Earth and Rare-Earth Metals and Their Electron Structure

borides is connected with the double ionization of metal atoms and with the transfer of 2 external s-electrons by a boron atom. In this way 5 covalent bonds are produced in the boron octahedra and between them. Reference is made to several earlier papers dealing with this subject. Next, binding between metal atoms and boron atoms is brought about by means of an electron collective, which is formed by the electrons of normal or excited d-orbits and partly also by such electrons as belong to the s-orbits of the metal as are not utilized for binding with boron. It is necessary, in the hexaborides of rare earth metals to investigate two systems of energy bands, viz. the narrow only slightly excited 4f-band and the comparatively broad hybride 5d-6d-band. The latter must determine electric conductivity and the work function of the electrons from the hexaborides under investigation. Several details are then dealt with. The above mentioned diagram also shows the number of possible terms for 4 f-electrons as function of the nuclear charge number of the metals, which were calculated according to the rule

Card 2/3 $kf^n = kf^{14-n}$ (where k denotes the number of terms). The maximum

On Rhenium Borides

There are 1 figure, and 6 references, 4 of which are Slavic.

ASSOCIATION: Institute for Metal Ceramics and Special Alloys AN USSR (Institut metallokeramiki i spetssplavov Akademii nauk Ukr. SSR).

PRESENTED: September 20, 1957, by I. I. Chernyayev, Academician

SUBMITTED: September 18, 1957

AVAILABLE: Library of Congress

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06400
SOV/170-59-2-18/23

5(2); 28(5)

AUTHORS: Samsonov, G.V., Neshpor, V.S., Serebryakova, T.I.

TITLE: The Increase in Electric Resistance of Directly Heated Cathodes Made of Borides of Rare-Earth Metals

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 2, pp 118-120 (USSR)

ABSTRACT: The use of thermal cathodes made of hexaborides of lanthanum, cerium and yttrium has been expanded in the recent time, but still it is hampered by their relatively low electric resistance. One of the possible ways of increasing their electric resistance is the use of their alloys instead of individual borides [Ref 2]. The authors prepared alloys of hexaborides of lanthanum and cerium by hot pressing the mixture of their powders under a pressure of 150 kg/cm^2 and at temperatures of 1,600 to 2,000°C. The sintered samples were subjected by an X-ray analysis in the RKE chamber, and the data obtained are presented in Table 1. The roentgenograms do not reveal characteristic lines of individual borides but two lines of their solid solution are observed. The specific electric resistance of the solid solutions of some borides is shown in the form of curves,

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The Increase in Electric Resistance of Directly Heated Cathodes Made of Borides of Rare-Earth Metals

electric resistance versus concentration, in Figure 1. It was found that alloys of hexaborides of lanthanum and cerium are most advantageous, among all the alloys investigated, for the use in directly heated cathodes. There are: 1 table, 1 graph and 3 references, 2 of which are Soviet and 1 American.

ASSOCIATION: Institut metallokeramiki i spetssplavov AN USSR (Institute of Metallo-ceramics and Special Alloys of the AS UkrSSR), Kiyev.

SOV/180-59-4-33/48

AUTHORS: Neshpor, V.S. and Samsonov, G.V. (Kiyev)

TITLE: The Plasticity of Titanium Silicides

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 4, pp 202-204 (USSR)

ABSTRACT: The shrinkage of samples made from the silicides Ti_5Si_3($TiSi_{0.6}$), TiSi and $TiSi_2$ during hot pressing was studied. The silicides were prepared by direct synthesis using a method described previously (Ref 6). The chemical and phase analyses are given in Table 1. The samples were made on a laboratory press without any special protective atmosphere using a pressure of 60 kg/cm^2. The shrinkage was measured by the distance between the top and lower parts (2) of the press in Fig 1. Fig 2 shows the relation between percentage shrinkage and the ratio T/T_s where T is the pressing temperature and T_s the melting point. The curves have two distinct parts (a-b) and (b-c) with a sharp transition at b. This corresponds to the stage when all the particles are in contact and recrystallization begins. The temperature where the point b occurs increases with increase in silicon despite a decrease in the strength of the atomic bond. This is explained by the

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15 (2), 15 (6)

AUTHORS: Neshpor, V. S., Kislyy, P. S.

SOV/131-59-5-9/12

TITLE: Hot Pressing of Chromic Boride Powder and Some Properties of the Sintered Material (Goryacheye pressovaniye poroshka borida khroma i nekotoryye svoystva spechennogo materiala)

PERIODICAL: Ogneupory, 1959, Nr 5, pp 231-236 (USSR)

ABSTRACT: In the present paper, the authors investigate the sintering conditions of the chromic boride powder which is obtained by the reaction of chromic oxide and boron carbide. The chemical composition of chromic boride is given in table 1. The sintering of the chromic boride powder was done by hot pressing by means of a laboratory lever press (Fig 1). At a temperature of 2000 ± 50°, a pressing effect of 180 kg/cm^2 and a sintering time of 10-12 min, it was possible to obtain samples with the minimum porosity of 3% (Fig 2). The melting temperature of the CrB_2 ascertained by the authors is 2200 ± 50° which comes near the temperature ascertained by Markovskiy (Ref 3). Figure 3 shows the relative change in weight at 1200° of the CrB_2 samples related to 1 cm^2 surface

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and figure 4 represents the curve of the change in weight. This change in weight is a function of the time of oxidation. The oxidation stability of the borides ascertained by Kotel'nikov (Ref 14) corresponds to the one in the present paper. The coefficients of expansion of three samples with different porosities at 500°, as well as the resistance to pressure and rupture of chromic boride samples with different porosities, are further indicated. Some properties of the chromic boride are given in table 2. Concerning the stability of the chromic boride against the action of active reagents, the authors of this article refer to the papers by Kotel'nikov (Ref 14) and Modylevskaya (Ref 22). The indicated properties of the chromic boride permit its use as a constituent of heat-resistant alloys. A shortcoming is its brittleness which can be reduced by cementing the boride grains with a metal binding agent. The cemented chromic boride can be used for the manufacture of nozzles for spraying fused metals, of crucibles and coats of thermo-elements for the temperature measurement in metallurgical furnaces. There are 4 figures, 2 tables, and 29 references,

Hot Pressing of Chromic Boride Powder and Some Properties of the Sintered Material

SOV/131-59-5-9/12

17 of which are Soviet.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute of Powder Metallurgy and Special Alloys of the AS UkrSSR)

Card 3/3

CZECH/34-59-6-4/23

AUTHORS: Samsonov, G. V., Nešpor, V. S. and Khrenova, L. M.

TITLE: Hardness and Brittleness of Compounds of a Metallic Nature (Tvrdost a křehkost sloučenin kovového charakteru)

PERIODICAL: Hutnické Listy, 1959, Nr 6, pp 484-489 (Czechoslovakia)

ABSTRACT: This is a revised version of a lecture given by Candidate of Technical Sciences G. V. Samsonov in Prague in the Spring of 1958. The high hardness of compounds of a metallic nature like carbides, nitrides, borides and silicides of the transient metals of the fourth to the eighth group of the periodic system is one of the most characteristic properties of these substances. In view of the high brittleness of these compounds, microhardness measurement appears to be the only suitable method of investigating their hardness. Earlier results obtained by the authors of this paper and other authors were published in earlier work (Refs 1 and 2). In this paper the authors describe their studies on the influence of loading of the diamond pyramid during measurement of the microhardness by the Soviet PMT-3 instrument on the measured microhardness values; the brittleness of the substances was evaluated

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Hardness and Brittleness of Compounds of a Metallic Nature

from the character of the indentation on the surface of test specimens during the indentation with the pyramid. The measured values of the microhardness, H_M kg/mm^2, obtained with loads of 20 to 200 g and of the micro-brittleness Z for 31 carbides, nitrides and silicides are entered in Table 1, p 485. The microhardness studies of very hard substances, described in the paper, prove that a clearly defined relation exists between the microhardness and the magnitude of the applied load and this can be clearly seen from the data entered in Table 1 and from the graphs, Figs 1-4. The brittleness of the compounds was measured by a microhardness method described by N. I. Ikornikova (Ref 15). The method consists of making imprints with a diamond pyramid with various loads and evaluating the number and the character of the produced cracks and other defects. The thus determined results are entered in Table 2, p 488. It was found that the dependence of the microhardness on the load is the same for materials with very high and with relatively low hardness values and appears to be

CZECH/34-59-6-4/23

Hardness and Brittleness of Compounds of a Metallic Nature

governed by the character of the plastic deformation of the surface of the hard materials during the micro-hardness measurements. The brittleness characteristics determined in the work described in this paper are in agreement with brittleness values determined for some compounds by other authors. The brittleness increases with decreasing square value of the deflection of the centre of the molecular complexes during thermal oscillations in the crystal lattices of the compounds, i.e. it increases if the strength of the interatomic bonds increases and if the stress relaxation in the material decreases. The hardness of compounds of a metallic nature increases in the following order: silicides, nitrides, carbides, borides, whilst the brittleness increases in the following order: silicides, borides, nitrides, carbides.
There are 10 figures, 2 tables and 19 references, 1 of which is Czech, 16 Soviet, 2 English.

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S/137/62/000/006/072/163
A052/A101

AUTHORS: Samsonov, G. V., Neshpor, V. S.

TITLE: Thermoemissive properties of transition metals and their compounds with boron, carbon, nitrogen and silicon

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 32, abstract 6G247 (In collection: "Vopr. poroshk. metallurgii i prochn. materialov". Kiyev, AN UkrSSR, no. 7, 1959, 99 - 104)

TEXT: Published data relating to the electric resistance and the work function of transition metals and their compounds with B, C, Na_2 and Si are analyzed. Electric resistance of metals increases with the growth of the value $\xi = (1/Z_d\ n)$, where Z_d is the number of electrons in a vacant shell and n is the main quantum number. This is connected with an increased shielding effect of defective shells. For metals the work function decreases with an increase of ξ. For refractory compounds of carbide, boride and nitride type these dependences have a reversed character, which is connected with the filling up of the holes in defective orbits by metalloid electrons and the corresponding decrease of the shielding effect.
[Abstracter's note: Complete translation] R. Andriyevskiy

Card 1/1

SAMSONOV, G.V. [Samsonov, H.V.]; NESHPOR, V.S.; PADERNO, Yu.B.

Thermionic emission properties of metal-like compounds. Ukr. fiz.zhur. 4 no.4:508-518 Jl-Ag '59. (MIRA 13:4)

1. Institut metallokeramiki i spetsplavov AN USSR.
(Thermionic emission) (Metals) (Metalloids)

NESHPOR, V.S.; NIKOLAYEVA, L.G. [Nikolaieva, L.H.]; KARAL'NIK, S.M.; KOROLENKO, Yu.I.

Investigation of the characteristic absorption of X rays in silicides of transition metals. Ukr.fiz.zhur. 4 no.6:814-815 N-D '59. (MIRA 14:10)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko i Institut metallokeramiki i spetsial'nykh splavov AN USSR.
(X-ray absorption) (Transition metal silicides)

SOV/78-4-9-5/44

5(2)
AUTHORS: Neshpor, V. S., Samsonov, G. V.

TITLE: On the Problem of the Electronic Structure and the Condition for the Formation of Borides of the Type MeB_6

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 1967-1969 (USSR)

ABSTRACT: The electrons necessary for the formation of the 5 covalent bonds in the hexaborides cannot be supplied by boron alone, two of them must be supplied by the metal (Refs 5, 6). The formation of the hexaborides probably depends on the first and second ionization potentials of the metal. The values of the potentials determine the attractive force of the two valence electrons. In table 1 the ionization potentials of the metallic elements of the periodic system are listed. It is concluded that all the metals having first ionization potentials below 6.6 - 6.8 ev, and second ionization potentials below 11.5 - 12 ev are able to form hexaborides. In reference 8 it was proved that the bivalent metal in the

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On the Problem of the Electronic Structure and the Condition for the Formation of Borides of the Type MeB_6

hexaboride may partially be substituted by sodium. The highest electron concentration at which this substitution still takes place, is 1.6 electrons per metal atom. Thus, it follows that the bond of the borine in MeB_6 requires 1.6 electrons, the remaining 0.4 electrons per metal atom probably being present as common electrons which would explain the comparatively high electrical conductivity of the hexaborides of bivalent metals. There are 1 table and 15 references, 10 of which are Soviet.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR
(Institute for Metal Ceramics and Special Alloys of the Academy of Sciences, UkrSSR)

SOV/20-122-6-16/49

On the Relationship Between the Work of Electron Yield From Hexaborides of Alkali-Earth and Rare-Earth Metals and Their Electron Structure

multiplicity and consequently also the highest degree of electron bound state and the lowest degree of probability of f-d-transitions according to this curve corresponds to Eu and Gd. A comparison of the curves for the dependence of the work function φ and the number k of terms on the nuclear charge number actually confirms their qualitative similarity. Finally, some particular features are pointed out. There are 1 figure, 1 table, and 15 references, 9 of which are Soviet.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute for Metal Ceramics and Special Alloys of the Academy of Sciences, UkrSSR)

PRESENTED: June 6, 1958, by S. A. Vekshinskiy, Academician

SUBMITTED: June 5, 1958

Card 3/3

SOV/126-7-4-10/26

AUTHOR: Neshpor, V.S.

TITLE: On the Relationship between Certain Thermal Properties of Solids

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 4, pp 559-564 (USSR)

ABSTRACT: The author discusses the relationship between thermal properties of solids (eg melting point, Debye characteristic temperature, coefficient of thermal linear expansion, thermal conductivity etc) and elastic properties. Such relationships are important in estimation of mechanical strength of solids at elevated temperatures. Using formulae established earlier (Ref 2,4,5), the author deduces

$$\theta \approx 10.97 \sqrt{\frac{C}{\alpha V^{2/3}}} = 10.97 \sqrt{\frac{C\gamma^{2/3}}{M^{2/3}\alpha}} \qquad (4)$$

i.e. $\theta/(C^{1/2}\gamma^{1/3}M^{-1/3})$ is proportion to $\alpha^{-1/2}$.
Here θ is the Debye characteristic temperature; C is the molar or atomic specific heat (cal $deg^{-1} mole^{-1}$ or cal deg^{-1} $g\text{-}atom^{-1}$); V is the molar or gram-atomic

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volume (cm^3); γ is the density of the solid (g/cm^3); M is the molecular or atomic weight in grams; α is the linear coefficient of thermal expansion. Fig 1 shows the dependence of log $[\theta/(C^{1/2}\gamma^{1/3}M^{-1/3})]$ on log α for cubic metals and carbides with metal-like structure. The experimental points were taken from earlier work (Ref 2,5,7,8) and they lie somewhat lower than the theoretical (dashed) curve 1. In fact the experimental points lie on a line 2 which can be given analytically as

$$\theta \cong 15.14\sqrt{\frac{C\gamma^{2/3}}{M^{4/3}\alpha}} \qquad (6)$$

Eq (6) can be used as a semi-empirical relationship in determination of θ from known values of the thermal expansion coefficient α (it is easier to measure α than θ). The Debye temperature is related to the melting point by Lindenmann's formula

$$\theta = 137\sqrt{\frac{T_s}{MV^{2/3}}} = 137\sqrt{\frac{T_s\gamma^{2/3}}{M^{4/3}}} \qquad (7)$$

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where T_s is the melting point on the absolute scale. Fig 2 shows, in logarithmic coordinates, the dependence of $\theta/(\gamma^{1/3}M^{1/6})$ on T_s. A dashed line (1) represents Eq (7). Experimental points taken from published work (Ref 2,5,7 and 8) lie around the curve 2. It follows therefore, that Lindemann's formula does not represent a mathematically correct relationship between θ and T_s and expresses only the fact that, at given values of the molecular weight, solids with high melting points have high Debye temperatures. To find an improved relationship between the Debye temperature and the melting point, the author used Eq (4) and the relationship between the coefficient of thermal expansion and the melting point. The latter relationship is shown in Fig 3. The points representing metals with cubic and hexagonal closely packed lattices and metal-like carbides, nitrides and borides of transition metals lie on the lower curve of Fig 3. The points representing alkali halides lie on the upper curve of Fig 3, because their linear expansion coefficients are higher (higher repulsive forces exist in ionic crystals). The two curves of Fig 3 are redrawn

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in logarithmic coordinates in Fig 4: line 1 of Fig 4 corresponds to metals and compounds with metal-like structure and line 2 represents alkali halides. Fig 4 shows that the linear expansion coefficient is given by $\alpha_\ell = kT_s^{-1.17}$, where $k = 0.0724$ for metals and metal-like compounds and $k = 0.115$ for alkali halides. Substituting the relationship $\alpha_\ell = kT_s^{-1.17}$ into Eq (4), a relationship is obtained between the Debye temperature and the melting point for metals and metal-like compounds

$$\Theta = \frac{41.08\ T_s 0.58 \sqrt{C\gamma^{2/3}}}{M^{1/3}} \qquad (13)$$

This equation is represented by a dashed line in Fig 5 and the experimental points are seen to lie around another line 2 which has a different slope. The experimental points of Fig 5 lead to a semi-empirical relationship between the Debye temperature and the melting point

$$\Theta = \frac{12.45\ T_s^{0.73} \sqrt{C\gamma^{2/3}}}{M^{1/3}} \qquad (15)$$

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Assuming that the linear expansion coefficient is inversely proportional to the melting point (this assumption does not differ greatly from $\alpha_l = kT_s^{-1.17}$) and substituting this proportionality into Eq (4) we find that

$$\Theta = \text{const}\sqrt{\frac{CT_s}{MV^{2/3}}} \qquad (16)$$

which differs from Lindenmann's formula (Eq 7) by the presence of the specific heat under the square-root sign. Using the inverse proportionality between the elastic modulus and the linear thermal expansion coefficient (Eq 1) we find that

$$\Theta = \text{const}\sqrt{\frac{T_s}{MV^{2/3}}} \qquad (17)$$

which has the same form as that of Lindenmann's formula. There are 5 figures and 10 references, 7 of

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which are Soviet, 2 German and 1 English.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN USSR (Metal-Ceramic and Special Alloy Institute, AS UkrSSR)

SUBMITTED: September 27, 1957

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AUTHORS: Sansonov, G.V., Neshpor, V.S. and Khrenova, L.M.

TITLE: Hardness and Brittleness of Metalloid Compounds

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 4, pp 622-630 (USSR)

ABSTRACT: Specimens of Ti, Zr, Cb, Ta, Cr, Mo, W, Ca, Ba, La and Ce borides and Ti, Zr, Cb, Ta, Cr, Mo, W, Fe, Co and Ni silicides, of limiting phase composition, were made by sintering powders of these compounds by hot pressing with subsequent long annealing at a high temperature in order to remove internal stresses. Microsections made from these specimens were etched in order to expose the grain boundaries and to remove the surface layer which had been cold worked during grinding. The microhardness was tested with a PMT-3 instrument. Loads of 20-200 g were used. The experiments have shown that the microhardness numbers depend on the load used, and this relationship is beyond the limits of accuracy of the measurements. The relationship between microhardness number and load was first established by Bochvar et al (Ref 4) for relatively soft materials (Cu, Zn and Armco iron). In other papers (Refs 5-7) the relationship

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between microhardness numbers and load for other metallic and non-metallic materials was established. Gogoberidze et al (Ref 8) note that the relationship between microhardness number and load appears to be of a general nature, as the apparatus for testing the microhardness, even if specially regulated so as to indicate microhardness numbers for a given material which are independent of the load, nevertheless shows this relationship in the investigation of harder materials. However, other authors (Refs 9, 10) insist that the microhardness number is independent of the load applied. Investigations carried out in this work of the microhardness of very hard materials have confirmed in all cases the existence of a definite relationship between microhardness numbers and load applied (Figs 1-4). In order to estimate the brittleness of metalloid compounds a micro-brittleness method was used (having been first suggested by Ikornikova, Ref 15) for the estimation of the brittleness of carborundum. The essence of this method consists in taking impressions of the diamond pyramid of the PMT-3 instrument at various loads and

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estimating the number and nature of cracks and other defects thereby arising. In order to lower the subjectiveness of this estimation a so-called average brittleness mark is introduced, which is calculated according to the degree of destruction shown by the impression. The estimation of the degree of destruction is carried out according to a 5-mark scale (see Fig 5 and Table 1). Figs 6 and 7 show the dependence of the summary mark of destruction of borides and silicides, respectively, on load. Table 2 shows the brittleness characteristics of metalloid compounds. The authors arrive at the following conclusions: The microhardness number depends on the load at which the investigation is carried out. The nature of the relationship between microhardness number and load of materials with very great and comparatively low hardness is identical and appears to be due to the nature of plastic deformation of the surface of hard bodies in microhardness testing. The brittleness characteristics of metalloid compounds obtained by the microbrittleness methods in this work agree satisfactorily

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with those obtained by the author earlier for several compounds. The brittleness of compounds increases with decrease in mean square displacement of molecular complex centres in the crystal lattices of the compounds, i.e. with increase in rigidity in the interatomic bond and with decrease in the possibilities of stress relaxations in the material. The hardness of metalloid compounds increases in the order silicide-nitride-carbide-boride, and the brittleness increases in the order silicide-boride-nitride-carbide.

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There are 7 figures, 2 tables and 18 references, of which 16 are Soviet and 2 English.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN USSR
(Institute of Metalloceramics and Special Alloys, Ac. Sc. Ukr.SSR)

SUBMITTED: November 1, 1958

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Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 151 (USSR)

24.2140

AUTHORS: Samsonov, G.V., Neshpor, V.S.

TITLE: On Superconductivity of Borides, Carbides, Nitrides and Silicides of Transition Metals

PERIODICAL: Sb. nauchn. tr. Nauchno-tekhn. o-va tsvetn. metallurgii, Moscow, in-t tsvetn. met. i zolota, Nr 29, pp 361 - 366

ABSTRACT: The authors analyze literature data on critical temperatures T_c in the transition to the superconducting state of silicides, borides, carbides and nitrides of transition metals. The values of T_c for MeSi, MeB, MeC and MeN compounds are connected with the dispersing (accepting) capacity of the metal atom and the magnitude of the ionization potential of the metalloid. The dispersing capacity of atoms of transition metals is approximately characterized by the 1/nN ratio, where n is the number of electrons in the incomplete d-level of the metal atom, and N is the main quantum number of the level. A decrease of the 1/nN number in the transition from Ti, Zr, V, Hf to Ta, Nb, W, Mo, i.e., from 0.167 - 0.100 to 0.05 - 0.067, is accompanied by a sharp increase in T_c of the

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corresponding compounds of these metals. In the MeSi → MeB → MeC → MeN series an increase of T_c was observed, due to the difference in ionization potentials of metalloid atoms and to the peculiarities of the crystalline structure of the compounds. It is mentioned that in a number of cases the value of T_c increases with a higher metalloid content in the phases. There are 31 bibliographical titles.

Ya.L.

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NESHPOR, V.S

PHASE I BOOK EXPLOITATION SOV/4347

Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov. Seminar po zharostoykim materialam

Trudy, vyp. no. 5 (Transactions of the Academy of Sciences, Ukrainian SSR, Institute of Metal Ceramics and Special Alloys, Seminar on Heat Resistant Materials, No. 5) Kiyev, Izd-vo AN Ukrainskoy SSR, 1960. 63 p. 2,000 copies printed.

Ed. of Publishing House: I.V. Kisina; Tech. Ed.: A.A. Matveychuk; Editorial Board: G.V. Samsonov (Resp. Ed.), I.N. Frantsevich, V.V. Grigor'yeva, A.Z. Men'shikov, and M.I. Korsunskiy.

PURPOSE: The book is intended for engineers, scientific workers and students specializing in refractory metals and their compounds, powder metallurgy, electronics, machine building and physical metallurgy in schools of higher technical education.

COVERAGE: This collection of papers, originally presented at the Seminar on Heat Resistant Materials in Kiyev on June 13-June 17, 1958,

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discusses the physical properties and production technology of refractory metals and their metal-like compounds with boron, carbon, nitrogen, and silicon. The results of investigations of the absorption and emission spectra of niobium and chromium compounds, processes of joint diffusion of two elements in metals, and data on phenomenological studies of physical properties of metal-like phases are presented. Methods of processing rare metals and refractory compounds in making powders and various articles used in many fields of modern technology are analyzed in detail. Several articles discuss the particular problems of powder metallurgy of ordinary metals and alloys. The papers reflect work performed at the following institutions: Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute of Metal Ceramics and Special Alloys, Academy of Sciences UkrSSR), Gosudarstvennyy institut prikladnoy khimii (State Institute of Applied Chemistry) Leningrad, Khar'kovskiy politekhnicheskiy institut (Khar'kov Polytechnic Institute), Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, Academy of Sciences USSR), Sverdlovskiy gosudarstvennyy universitet (Sverdlovsk State University), VIAM, TsNIIChERMET, VNIITASh, Institut metallurgii AN USSR (Institute of Metallurgy, Academy of Sciences UkrSSR) VNIITS, NIIGKRE, MKTS, Gor'kovskiy politekhnicheskiy institut (Gor'kiy Polytechnic Institute), and Moskovskiy elektrolampovyy zavod (Moscow Electric Bulb Plant). References accompany individual articles.

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AUTHOR: Samsonov, G.V. and Neshpor, V.S.

TITLE: Alloys of rare metals with bor and silicon for some purposes of electrical and radioengineering

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 4, 1961, 3, abstract 4 G15 (V sb. Redk. metally i splavy, M., Metallurgizdat, 1960, 392-417)

TEXT: The conditions of obtaining silicides and borides of rare metals are investigated and their physical properties are studied for possible application. The silicides are obtained by heating the mixture of the components in powdered form at a pressure of 250 kg/cm^2 and at a temperature of 1300-2150°C. The synthesis of the borides is carried out by utilizing the interaction of metal oxides with boroncarbide and carbon in vacuum. The structure of the obtained alloys is investigated and their crystal structure is determined. The hexaborides are distinguished by their low work

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