ZHURAVLEV, M.V.

Chemical principles of the biological productivity of the Mingechaur Reservoir. Dokl.AN Azerb. SSR 16 no.2:191-194 '60.
(MIRA 13:8)

1. Institut zoologii AN AzerSSR. Predstavleno akademikom AN AzerSSR A.N.Derzhavinym.
(Mingechaur Reservoir)

ZHURAVLEV, M.V.

Daily cycle of certain hydrochemical components of water in the Minegechaur Reservoir. Dokl.AN Azerb.SSR 15 no.12: 1161-1164 '59. (MIRA 13:4)

1. Institut zoologii AN AzerSSR. Predstavleno akademikom AN AzerSSR A.N.Dershavinym.
(Minegechaur Reservoir--Water)

ZHURAVLEV, M. Z.

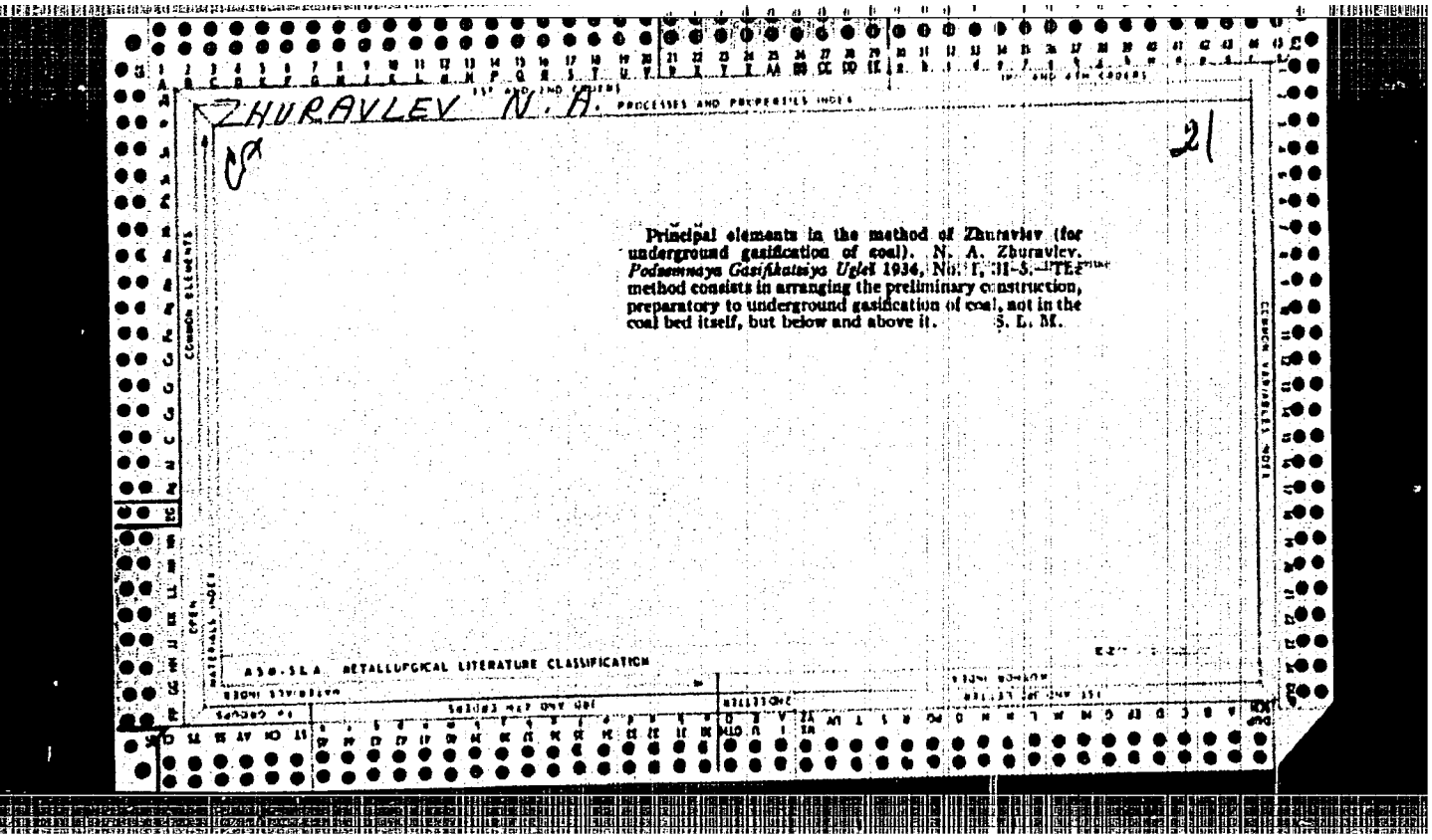
"Certain Problems of Soil Evaporation Under Conditions of the Black Earth Zones of Western Siberia," Works of Omsk Institute of Agricultural Economy, Vol XX, 1945 (3-32), (Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953

ZHURAVLEV, N.

Single shift mining in twin longwall entries. Mast.ugl. 5 no.2: 1-2 F '56. (MLRA 9:6)

1. Nachal'nik uchastka shakhty No.3 "Lipkovskaya" kombinata Tulaugol'. (Moscow Basin--Coal mines and mining)



ZHURAVLEV, Nikolay Antonovich,; RODIONOV, M., red.; SHUVALOV, I., tekhn. red.

[On the front line] Na perednem krae. [Moskva] Izd-vo TsK VLKSM "Molodaia gvardiia," 1958. 63 p. (MIRA 11:11)

1. Sekretar' Voronezhskogo obkoma Vsesoyuznogo Leninskogo Kommunisticheskogo soyuza molodezhi.
(Voronezh Province--Collective farms)

ZHURAVLEV, N.

Moving Pictures in Agriculture

Agricultural news., Kinomekhanik, no. 10, 1951.

Monthly List of Russian Accessions, Library of Congress, May 1952, UNCLASSIFIED.

ZHURAVLEV, N.

Moving pictures in Education

"The Universe", Kinomekhanik, No. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952, UNCLASSIFIED.

1. ZHURAVLEV, N.

2. USSR (600)

4. Moving Pictures - Periodicals

7. "News from rural areas," Kinomekhanik, No. 9, 1952.

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

ZHURAVLEV, N.; KATSEV, I., redaktor; VOLYNTSEVA, V., tekhnicheskiy redaktor.

[On ocean ice; outline of the film] Vo l'dakh okeana; ocherk o fil'me. Moskva, Gos. izd-vo "Iskusstvo," 1953. 31 p. (MLRA 8:2)
(Arctic regions) (Motion pictures, Documentary)

ZHURAVLEV, N. A. jt. au.

Sel'skokhoziaistvennye fil'my - zriteliu Agricultural films - for the audience Moskva, Iskusstvo, 1954. 70 p. (54-44185)

S535.R9G7

ZHURAVLEV, N. A.

USSR/Agriculture - Farming Methods

Card 1/1

Author : Zhuravlev, N. A.

Title : The motion picture story of the green squares (New ideas in potato cultivation)

Periodical : Nauka i Zhizn' 21/4, 46-47, April 1954

Abstract : During the war the scarcity of people on the farms and the need for food made it necessary to invent labor-saving schemes and thus arose the idea of planting potatoes for cross cultivation. To offset the reduced number of stalks in a row, two tubers were planted in a hill. An educational film was made of this method and it is being initiated by more and more farms. Photographs.

Institution : ....

Submitted : ....

ZHURAVLEV, N.A.

Rewarding the participants in the Exhibition of Achievements of the National Economy of the U.S.S.R. for work in the field of water management. Gidr. i mel. 14 no.7:64 Jl '62. (MIRA 17:2)

1. Starshiy ekskursovod pavil'ona "Vodnoye khozyaystvo" na Vystavke dostizheniy narodnogo khozyaystva SSSR.

ZHURAVLEV, N. A.

Rewards to the participants of the Exhibition of Achievements of the National Economy of the U.S.S.R. for work in hydraulic engineering. Gidr. i mel. 15 no.2:64 F '63. (MIRA 16:4)

1. Starshiy ekskursovod pavil'ona Vodnogo khozyaystva na Vystavke dostizheniy narodnogo khozyaystva SSSR.
(Moscow—Exhibitions)
(Hydraulic engineering—Exhibitions)

ZHURAVLEV, N. F.

Cigar Manufacture

Restoration of twisting pipes on Elison wrapper machines. Tabak 13 no. 4, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.

ZHURAVLEV, N.I., KAN'SHINA, N.F., NOVAKOVSKAYA, Ya.S. PERKEL', N.V. RUBINSHTEYN, Yu.I. (Moskva)

Controversial aspects in the etiology of Kaschin-Beck disease. Klin.med. 36 no.6:148-152 Je '58 (MIRA 11:7)
(ARTHRITIS, etiol. & pathogen. deformans endemica (Rus))

ZHURAVLEV, N.I., inzhener-khimik, prepodavatel'

Miscalculations in the design of drying cylinders for papermaking machinery. Bum.prom. 38 no.2:32-33 F '63. (MIRA 16:2)

1. Yuzhno-Sakhalinskiy lesotekhnicheskiy tekhnikum.
(Papermaking machinery)

ZHURAVLEV, N.I.

Rubber-coating of the rolls of papermaking machines and manufacture of industrial rubber goods in Sakhalin. Kauch. i rez. 22 no.5: 55 My '63. (MIRA 16:7)
(Sakhalin—Paper industry) (Rubber goods)

ZHURAVLEV, N.I., inzh.-khimik

Rubberizing of the rollers of papermaking machinery on Sakhalin. Bum.prom. 37 no.10:28 O '62. (MIRA 15:11)
(Sakhalin—Papermaking machinery—Maintenance and repair)

ZHURAVLEV, N.M., inzh.

Some shortcomings of concrete plants. Mekh. stroi. 17 no.10:17-19 O '60. (MIRA 13:10)
(Krivoy Rog Basin--Concrete plants)

ZHURAVLEV, N.N.

USSR

548.5 : 537.312.62

12638. The structures of superconductors. I. Study of the system bismuth/nickel. Preparation and investigation of single crystals of Bi_3Ni. G. S. Zhdanov, V. P. Glagoleva, N. N. Zhuravlev and Yu. N. Venevtsev. Zh. eksper. teor. Fiz., 25, No. 1 (7), 115-22 (1953) In Russian.

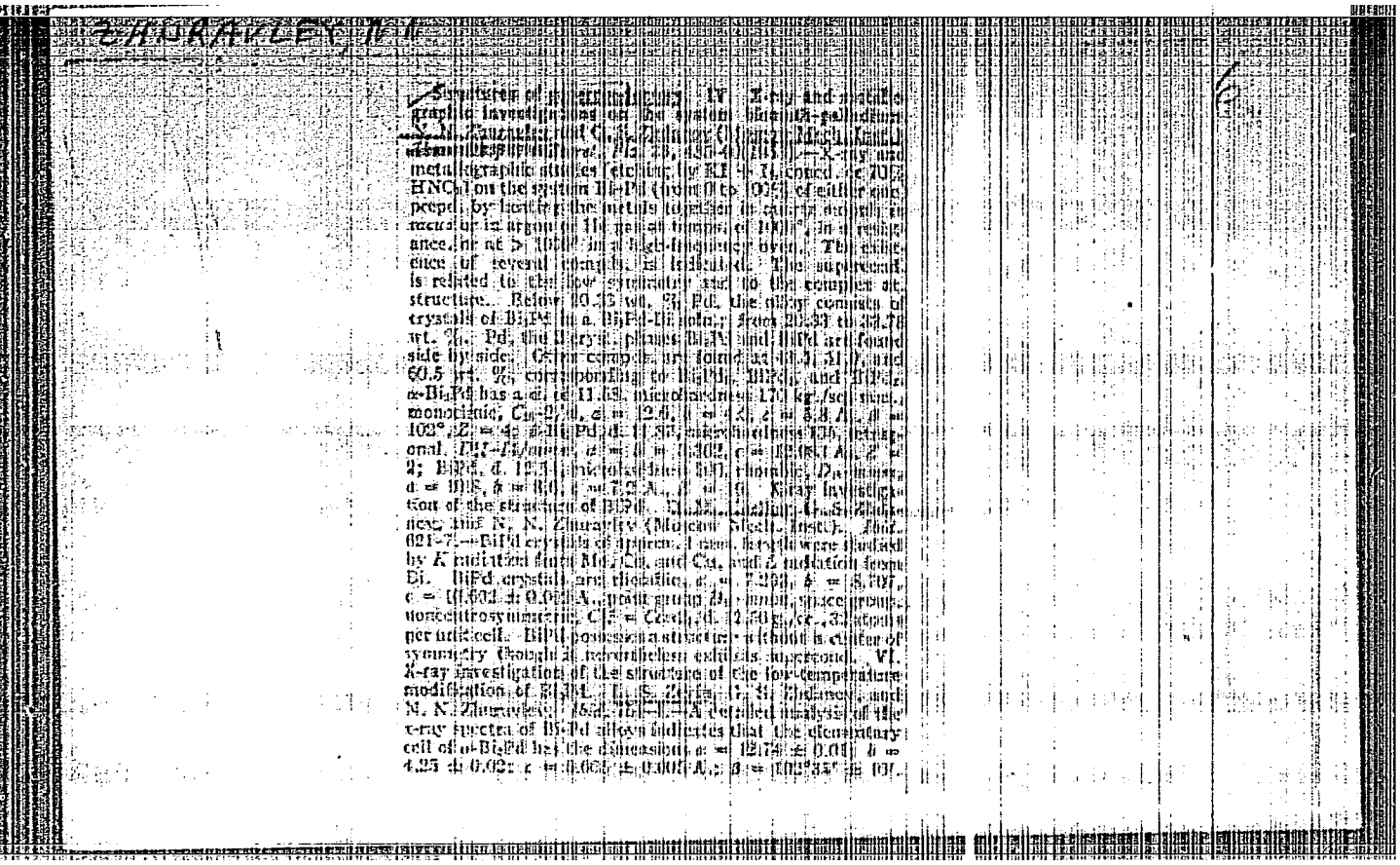
Diagrams showing hardness and density of solid phases in the Bi-Ni system were constructed. BiNi, which has the NiAs structure, was both the hardest and densest phase to appear. Either BiNi or Bi_3Ni crystals could be produced from the same melt, depending on the degree of supercooling. A technique for the production of the latter was elaborated and the unit cell was measured. [See Abstr. 11157 (1954) for full details. For Pt II, see Abstr. 11077 (1954).]

A. L. Mackay

ZHURAVLEV, N. N., ZHDANOV, G. S., and ALEKSEYEVSKIY, N. E.

"The Structures of Superconductors. II The Low-Temperature Decomposition of the Metallic Compound Au_2Bi," Journal of Experimental and Theoretical Physics, 1953, Vol. 25, No. 1 (7), pp 123-126.
(Moscow Mechanical Institute)

"Microscopic and X-ray powder investigations established that the superconductor Au_2Bi decomposes at low temperatures; this explains why a small displacement of the temperature of transition to the superconducting state is observed in specimens which have undergone hydrostatic compression."



ZHURAVLEV, N. N.

USSR.

548.736.3 [illegible]

[illegible] The structure of [illegible] X-ray [illegible] of the [illegible] G. S. Zhdanov and N. N. Zhuravlev [illegible] [illegible]

For Pt IV, see Abstr. 10004 (1954). Crystals of BiPd are orthorhombic with unit cell dimensions $a = 7.203 \pm 0.001$, $b = 8.707 \pm 0.002$ and $c = 10.662 \pm 0.001$ Å. The space group is [illegible] $Z = 16$ and $\rho_{calc} = 12.5$ g/cm³. Geometrical analysis and the Patterson projections $P(0yz)$ and $P(x0z)$ gave phases from which the Fourier projections $F(xy0)$ and $F(0yz)$ were calculated. The structure obtained confirmed the choice of space group. The unsaturated structure of BiPd is like that of the [illegible] Tl structure with distortion of the polyhedra. This appears to be the first noncentrosymmetric structure which has been observed to possess superconducting properties.

— [illegible]

ZHURAVLEV N.N.

USSR.

548.736.4 : 537.312.62

11566. The structures of superconductors. VI. X-ray crystallographic study of the structure of the low-temperature modification of Bi_2Pd. L. S. Zevin, G. S. Zhdanov and N. N. Zhuravlev. *Zh. eksper. teor. Fiz.*, 13, No. 6 (12), 291–294 (1943). In Russian.

The dimensions of the monoclinic unit cell of x-Bi_2Pd were found to be $a = 12{\cdot}74 \pm 0{\cdot}01$, $b = 4{\cdot}25 \pm 0{\cdot}02$ and $c = 5{\cdot}465 \pm 0{\cdot}005$ Å, with $\beta = 102° 35' \pm 10'$. The space group is C_{2h}^3, $\rho_{calc.} = 11{\cdot}5$ g/cm³ and $Z = 4$. The Bi and Pd atoms lie in the planes of symmetry with the parameters (x, y, z): Bi I (0·156, 0, 0·321); Bi II (0·076, ½, 0·796) and Pd (0·276, 0, 0·820). The structure is closely related to those of β-Bi_2Pd and $BiPd$.

A. I. Kitaigorodskii

ZHURAVLEV, N. N.

Chemical Abstracts
May 25, 1954
General and Physical
Chemistry

Roentgenographic establishment of formation of solid solutions in boron carbide. G. S. Zhdanov, N. N. Zhuravlev, and L. S. Zevin (Ministry of Culture, Moscow). *Doklady Akad. Nauk S.S.S.R.* 92, 767-8(1953); cf. *ibid.* 32, 433(1941); *C.A.* 38, 6707[4].—The results of x-ray analysis of boron carbide are summarized as supporting the unit structure $B_{12}C_3$, i.e., equiv. to B_4C. The already established variations of the dimensions of the unit cell can be explained by formation of solid solns. of displacement, rather than of the intrusion, type. Most likely is the displacement of part of C atoms in 1b positions by B atoms. The latter, possessing *sp*-electrons, can assume linear valence configuration analogous to that of C and an increase of B content in a unit cell in solid soln. would call for increase in unit-cell size. The smallest change occurs in specimens of the carbide that have the least amt. of B in soln. The limiting formula of solid soln. with the greatest content of B is $B_{4.5}C$, but the formation of solid solns. throughout the interval may not necessarily take place. Introduction of O into similar structures is excluded, since O forms angular, rather than linear, valence structures at the expense of its p^2 electrons.

G. M. Kosolapoff

ZHURAVLEV, N. N.

"X-Ray Diffraction and Metallographic Investigation of Certain Superconducting Alloys on a Bismuth Base." Cand Tech Sci, Moscow Engineering-Physics Inst, Moscow, 1954. (RZhKhim, No 5, 1955)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

ZHURAVLEV, N. N.

USSR/Physics - Superconductivity FD-751

Card 1/1 : Pub 146-21/22

Author : Alekseyevskiy, N. Ye., Zhuravlev, N. N., and Lifanov, I. I.

Title : Problem of superconductivity of Bi_2Pd

Periodical : Zhur. eksp. i teor. fiz., 27, 125-126, Jul 1954

Abstract : Letter to the editor. Studies of tetragonal modification of Bi_2Pd at low temperatures revealed superconductivity at 4.28°K. Indebted to Prof. G. S. Zhdanov for experimental work. 5 references.

Institution : Institute of Physical problems; Acad. Sci USSR

Submitted : February 3, 1954

ZHURAVLEV, N. N.

USSR/ Chemistry Solubility

Card : 1/1

Authors : Zhdanov, G. S., Heerson, G. A., Zhuravlev, N. N., and Samsonov, G. V.

Title : Solubility of boron and carbon in boron carbide $B_{12}C_3$ (B_4C)

Periodical : Zhur. fiz. khim. 28, Ed. 6, 1076 - 1082, June 1954

Abstract : X-ray investigations were conducted to determine the possibility and solubility limits for B and C in B_4C and to explain the mechanism of the latter with respect to the solubility of components in a covalent chemical compound. The fact that the solution takes place by displacement of C-atoms in 1b positions by B-atoms and consequent formation of B_4C of the $B_{13}C_2$ composition, was established on the basis of roentgenograms. More detailed results are given in graphs. Eleven references: 7 USSR, 2 USA and 2 German. Table, drawing, illustrations.

Institution : The M. I. Kalinin Institute of Non-Ferrous Metals and Gold and the Mechanical Institute, Moscow

Submitted : September 19, 1953

ZHURAVLEV, N. N.

USSR/Solid State Physics - Structural Crystallography, E-3

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34654

Author: Samsonov, G. V., Zhuravlev, N. N.

Institution: None

Title: On Aluminum Boride AlB_{12}

Original Periodical: Fiz. metallov i metallovedeniye, 1955, 1, No 3, 564-566

Abstract: AlB_{12} crystals were obtained by aluminum-thermal reduction of boric anhydride in crucibles. The contents of boron in the beads obtained during the melting amounted to 82.5 - 82.8%. Almost all the AlB_{12} crystals were double growths. X-ray structural investigation has shown that AlB_{12} belongs to the tetragonal syngony and has the following periods: a 10.1 $\pm$ 0.1; c 14.3 $\pm$ 0.4 A and c/a = 1.41, ρ 2.79 $\pm$ 0.02, number of atoms per elementary cell approximately 200. The electric resistivity of the pressed powder of AlB_{12} is related to the density as follows: $\ln \rho = 7.588\gamma - 15.03$, where ρ is the resistivity (ohms/cm), and γ the density of the pressed briquette. The electric resistivity of the specimens of AlB_{12} in compact state, prepared by hot pressing, amounts to approximately 10^3 ohms/cm, the thermal coefficient of electric resistivity is 0.4%/deg. The micro-hardness of AlB_{12} is close to the micro-hardness of B.

- 1 -

1 of 1

FD-1621

ZHURAVLEV, N. N.

USSR/Physics - Superconductors

Card 1/1 Pub 146-12/25

Author : Zhuravlev, N. N., and Zhdanov, G. S.

Title : The structure of superconductors. VIII: Roentgenographic and metallographic investigation of the system bismuth-rhodium

Periodical : Zhur. eksp. i teor. fiz. 28, 228-236, February 1955

Abstract : The authors investigate roentgenographically and metallographically the system Bi-Rh, in which they establish the existence of three compounds: BiRh, Bi_2Rh in two modifications and Bi_4Rh in three modifications. They obtain crystals and determine the elementary nucleus and spatial group of alpha-Bi_4Rh and the elementary nuclei of alpha and beta Bi_2Rh. They thank Prof. N. Ye. Alekseyevskiy and V. P. Glagoleva for advice; and I. I. Lifanov, N. P. Ivanova, Ye. I. Michurina, and N. S. Semeyko for the preparation of the alloys, roentgenograms, and microsections. Seven references.

Institution: Moscow Engineering Physics Institute

Submitted : February 24, 1954

USSR/Physics - Superconductors

Card 1/1 Pub 146-13/25 FD-1828

Author : Alekseyevskiy, N. Ye.; Zhdanov, G. S.; Zhuravlev, N. N.

Title : Problem of the superconductivity of the compounds Bi_4Rh and Bi_2Rh

Periodical : Zhur. eksp. i teor. fiz. 28, 237-240, February 1955

Abstract : The authors determine the temperatures of transition in the superconducting state for the crystals of beta and gamma-Bi_4Rh. They explain the unstable behavior of the superconducting alloys of bismuth with rhodium. They thank I. I. Lifanov and N. P. Ivanova for assistance in the experiments. Five references; e.g. Ye. Ya. Rode, Izvestiya In-ta platiny [News of the Institute of Platinum], 7, 1929.

Institution: Institute of Physical Problems; Moscow Engineering Physical Institute

Submitted : February 24, 1954

ZHURAVLEV, N.N.

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

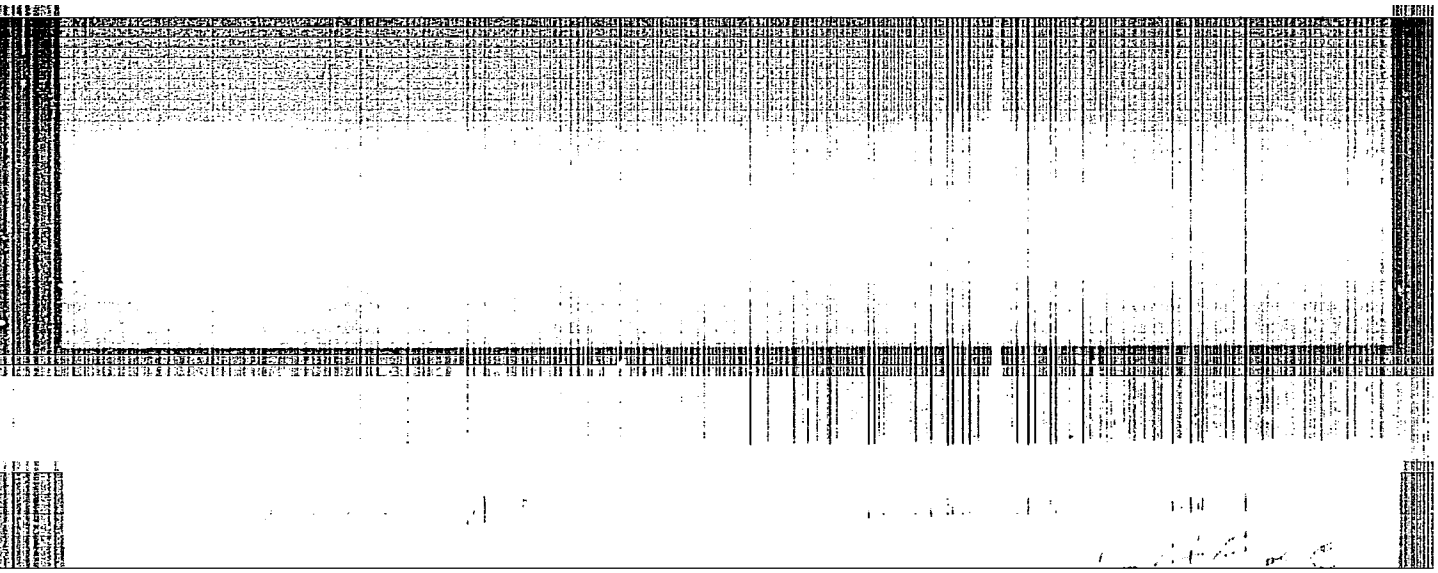
Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3785

Author : Zhuravlev, N.N., Zhdanov, G.S.
Title : Metallographic and X-ray Diffraction Investigation of Alloys of the Germanium-Rhodium System

Orig Pub : Kristallografiya, 1956, 1, No 2, 205-208

Abstract : The existence of four compounds was observed in the Ge-Rh system: Rh_3Ge_4, RhGe, Rh_5Ge_3, and Rh_2Ge. It is assumed that Rh_3Ge_4 and Rh_5Ge_3 are formed by peritectic reactions. The compounds RhGe and Rh_2Ge correspond to the maxima on the meltability diagram. The contours of the meltability diagrams are indicated. The density of compounds of the Ge-Rh system are determined and their microhardness is measured. It is found that the Rh_3Ge_4 compound crystallizes in a tetragonal syngony with periods: a 5.7 ± 0.2, c 10 ± 0.3 A. No solubility of Rh in Ge or of Ge in Rh was observed.

Card : 1/1



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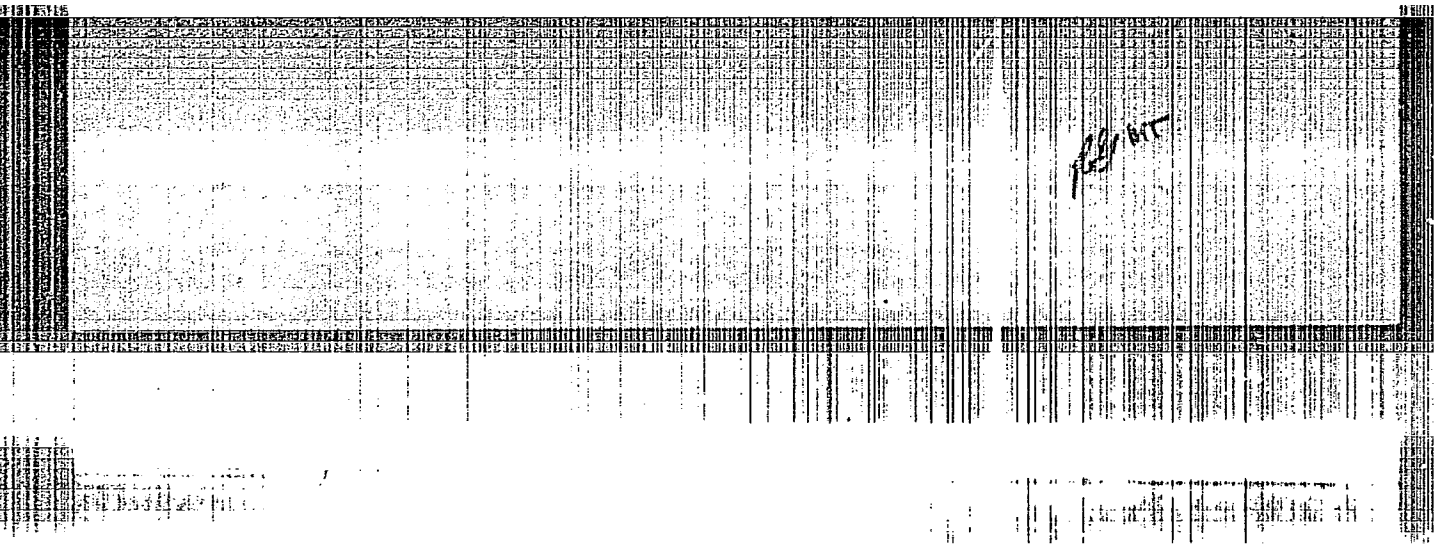

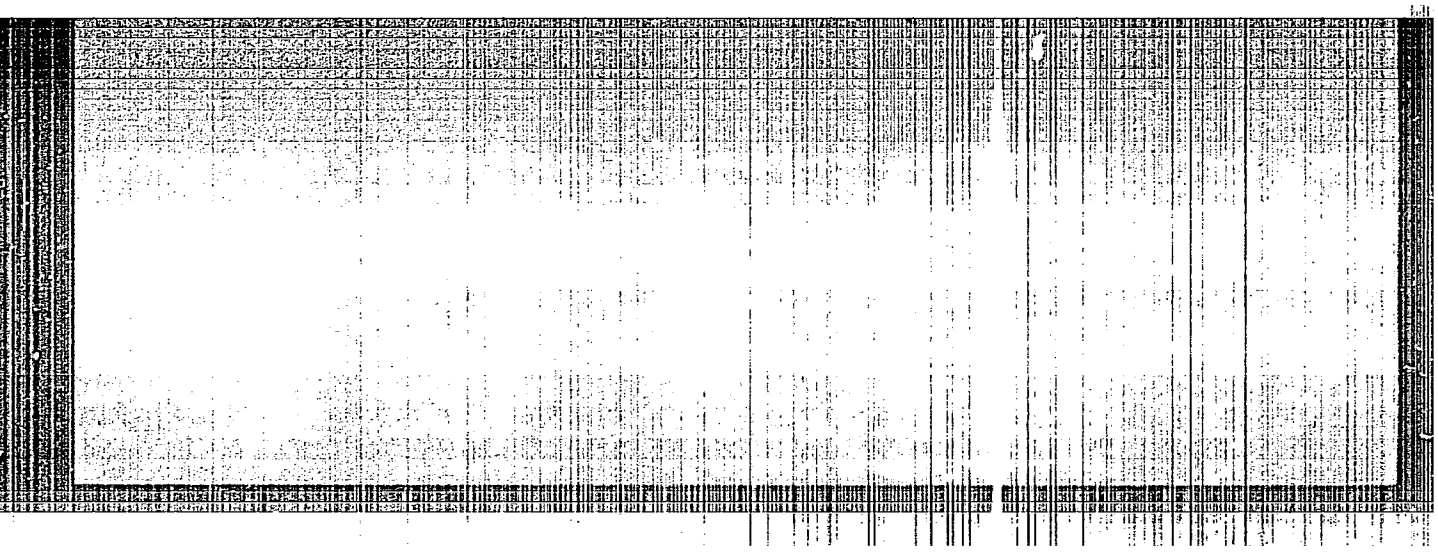

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Zhuravlev, N.N.

USSR / Solid State Physics / Structure of Alloys and Other Systems E-5

Abs Jour : Ref Zhur - Fizika, No. 5, 1957 No. 11689

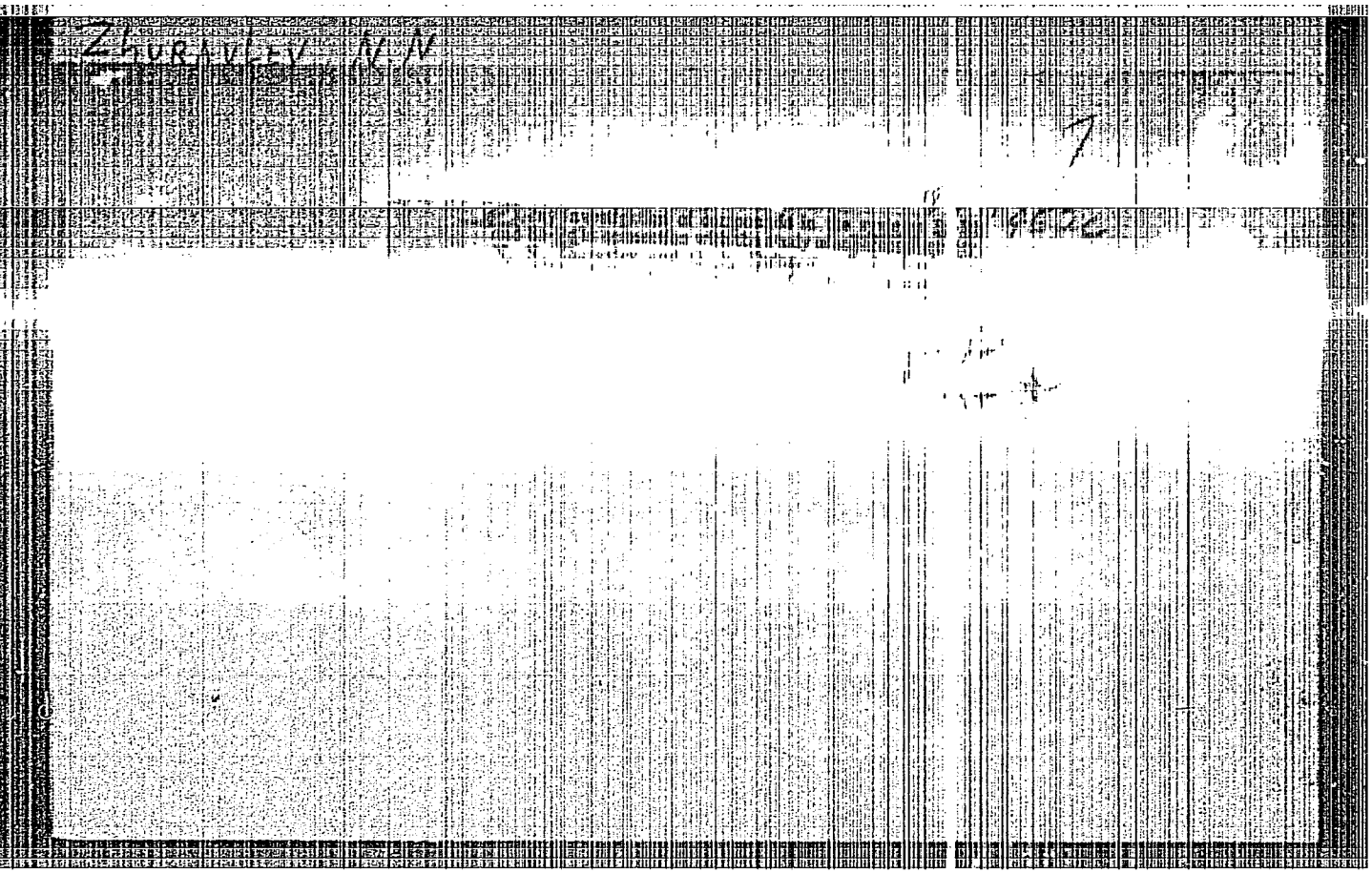
Author : Samsonov, G.V., Zhuravlev, N.N., Amnuel', I.G.
Inst : -
Title : Concerning the Problem of the Physical-Chemical Properties of Alloys of Boron With Carbon.

Orig Pub : Fiz. Metallov i Metallovedeniye, 1956, 3, No.2, 309 - 313

Abstract : X-ray-diffraction and microscopic investigations were made along with a study of the electric resistivity and the density, of alloys of boron with carbon over a range of carbon contents from 5 to 72.5% by weight. It is established that at carbon contents of 5% and above there is formed in the boron alloys a defect structure $B_{13}C_2$, characterized by a presence of vacancies on the c axis. At 14 -- 16% carbon, the vacancies are filled by carbon atoms, forming a line C -- B -- C --, which then changes into the line C -- C -- C---

Card: 1/2

Inst Non-ferrous Metals & Gold im M. I. Kalinin



ZHURAVLEV, N.N.

USSR / Physics of Low Temperatures. D-5

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9054

Author : Zhuravlev, N.N., Zhdanov, G.S.
Inst : Physics Faculty, Moscow State University
Title : X-Ray Diffraction Investigation of Compounds in the Bi-Rh and Bi-Pd Systems in Connection With a Study of Superconductivity.

Orig Pub : Izv. AN SSSR, ser. fiz., 1956, 20, No 6, 708-713

Abstract : An investigation of the Bi-Rh system has shown that this system contains three intermetallic compounds: Bi-Rh (I), Bi_2Rh (II), and Bi_4Rh (III). For isolated crystals of these compounds, data are determined on their crystalline structure, and also certain physical properties, including the temperature T_c of transition to the superconducting state. For I, $T_c = 2.06^{\circ}$ K. It is established that two out of three modifications of II (α and β) do not go into

Card : 1/2

USSR / Physics of Low Temperatures. D-5

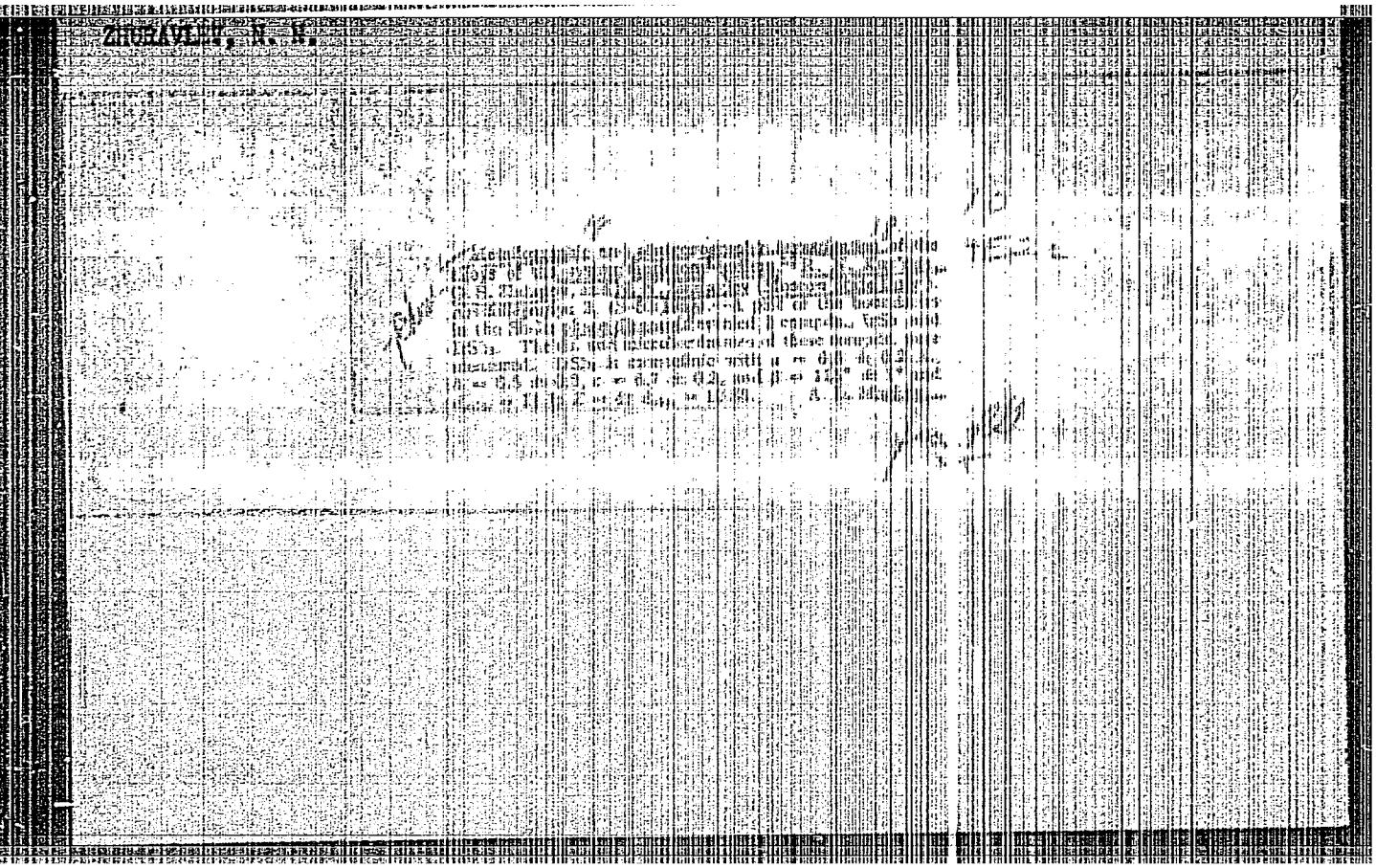
Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9054

Author : Zhuravlev, N.N., Zhdanov, G.S.
Inst : Physics Faculty, Moscow State University
Title : X-Ray Diffraction Investigation of Compounds in the Bi-Rh and Bi-Pd Systems in Connection With a Study of Superconductivity.

Orig Pub : Izv. AN SSSR, ser. fiz., 1956, 20, No 6, 708-713

Abstract : An investigation of the Bi-Rh system has shown that this system contains three intermetallic compounds: Bi-Rh (I), Bi_2Rh (II), and Bi_4Rh (III). For isolated crystals of these compounds, data are determined on their crystalline structure, and also certain physical properties, including the temperature T_c of transition to the superconducting state. For I, $T_c = 2.06^{\circ}$ K. It is established that two out of three modifications of II (α and β) do not go into

Card : 1/2



ZHURAVLEV, N.N.

70-2-16/24

AUTHOR: Zhdanov, G.S., Zhuravlev, N.N., Stepanova, A.A. and Umanskiy, M.M.

TITLE: The crystal chemistry of metal hexaborides. (Kristallokhimiya geksaboridov metallov)

PERIODICAL: "Kristallografiya" (Crystallography), 1957, Vol.2, No.2, pp. 289-290 (U.S.S.R.)

ABSTRACT: The MeB_6 structure consists of a three-dimensional framework of B atoms with Me atoms in the interstices and is formally like the CsCl structure with B_6 and Me units. In group II, Be, Mg, Ca, Sr and Ba form hexaborides as do Y, La, Ce, Pr, Nd, Gd, Er, Yb in group III. The formation by the remaining lanthanides and by Sc of hexaborides can also be predicted. In group IV, SiB_6 and ThB_6 are known. When the unit cell sizes are plotted against atomic radii the compounds fall into three series corresponding to the three groups. Coefficients of thermal expansion of CaB_6 and SiB_6 have been measured by X-ray diffraction (5.9 and 6.5 x 10^{-6}, respectively and are added to the measurements already made (A.A.Stepanova and M.M. Umanskiy, Trudy soveshchaniya po khimii bora i ego soedineniy. Fiz.-Khim. in-t. im. Karpova, 1955) for Ce, La and Ba (7.3, 6.4 and 6.8 x 10^{-6}, respectively). The coefficient

Card 1/2

The crystal chemistry of metal hexaborides. (Cont.)

for Ce apears to be anomalous.

There are 4 figures and 8 references, 6 of which are Slavic.

ASSOCIATION: Moscow State University. (Moskovskiy Gosudarstvennyy Universitet)

Card 2/2

SUBMITTED: October 8, 1956.

AVAILABLE: Library of Congress

AUTHOR: ZHURAVLEV, N.N. (Moscow) 56-6-6/56

TITLE: Structure of Superconductors. X. Thermal, Microscopic, and X-Ray Investigation of the Bismuth-Palladium System. (Struktura sverkhprovodnikov. X. Termicheskoye, mikroskopicheskoye i rentgenograficheskoye issledovaniya sistemy vismut-palladiy, Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1305 - 1312 (U.S.S.R.).

ABSTRACT: For a bismuth-palladium alloy containing up to 45 weight % palladium the exact phase diagram was set up. Furthermore, the density of the alloy σ, its average hardness H, and the transition temperature T_k was measured at which the alloy becomes supraconductive. The corresponding data are:

alloy	σ in h/cm^3	H in kg/MM^2	T_k in ^oK
α - Bi_2Pd	11,65	170	1,7
β - Bi_2Pd	11,87	135	4,25
BiPd	12,56	200	3,7
γ - BiPd (43,5 weight % Pd)	12,7	400	3,7 to 4

Card 1/2

ZHURAVLEV, N.N.

56-6-7/56

AUTHOR: ZHURAVLEV, N.N., KERTES, L.

TITLE: Structure of Supraconductors. XI. Investigation of Platinum, Ruthenium, Osmium and Iridium Alloys of Bismuth. (Struktura sverkhprovodnikov. XI. Issledovaniye splavov vismuta s platinoy, rutheniyem, osmiyem i iridiyem, Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1313-1318 (U.S.S.R.)

ABSTRACT: For the Bi - Pt alloy the phase diagram was set up. There are two alloys: a) Bi_2Pt - which exists with a α and β modification; transformation temperature $\sim 390^\circ$ C, b) BiPt - which melts at $\sim 760^\circ$ C and forms a eutectic mixture with platinum. Direct melting experiments between bismuth on the one hand and rhuthenium, osmium and iridium on the other were unsuccessful. (With 1 Table, 7 Illustrations, and 12 Slavic References).

ASSOCIATION: Moscow State University
PRESENTED BY:
SUBMITTED: 4.1.1957
AVAILABLE: Library of Congress

Card 1/1

SOV/70-3-1-13/26

AUTHORS: ~~Zhuravlev, N.N.~~ and Stepanova, A.A.

TITLE: X-ray Determination of the Structure of ScB_2 (Rentgenograficheskoye opredeleniye struktury ScB_2)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 1, pp 83 - 85 (USSR)

ABSTRACT: There are no data in literature on the existence of compounds of scandium with boron. The compound, which was investigated by the present authors, was obtained at the Institut metallokeramiki i spetsial'nykh splavov AN SSSR (Institute for Metallo-ceramics and Special Alloys of the Ac.Sc.USSR) by G.V. Samsonov. The weight of the specimen was about 15 mg and was in the form of a powder. Powder photographs with and without rotation were obtained with the specimen. A large number of lines were found. It was shown that ScB_2 belongs to the hexagonal syngony and is isostructural with AlB_2. The following lattice constants were obtained:
$a = 3.140 \pm 0.002$ kX; $c = 3.510 \pm 0.002$ kX;
$c/a = 1.118$; $\sigma_x = 3.67$ g/cm^3; $z = 1$; space group D_{6h}^1 - C6/mmm .

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X-ray Determination of the Structure of ScB_2 SOV/70-3-1-13/26

The following persons are thanked for advice and help: Professor G.S. Zhdanov, Docent M.M. Uranskiy, G.V. Samsonov and N.V. Troneva.
There are 3 references, 2 of which are Soviet and 1 German.

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

SUBMITTED: February 27, 1957

Card 2/2

SOV/70-3-1-19/26

AUTHORS: Stepanova, A.A. and Zhuravlev, N.N.

TITLE: X-ray Study of the Borides YbB_6, UB_4, HoB_4 and GdB_4 (Rentgenograficheskoye issledovaniye boridov YbB_6, UB_4, HoB_4 and GdB_4)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 1, pp 94 - 95 (USSR)

ABSTRACT: Specimens of the substances were prepared at the Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute for Metallo-ceramics and Special Alloys of the Ac.Sc. Ukrainian SSR) by G.V. Samsonov. They were in the form of powders. The thermal expansion of YbB_6 (cubic) was determined and the coefficient of thermal expansion for the substance was found to be 5.85×10^{-6} deg^{-1}. Figure 1 shows the dependence of the period a of this substance on temperature. The following table gives the data obtained for the other three substances (tetragonal):

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SOV/70-3-1-19/26

X-ray Study of the Borides YbB_6, UB_4, HoB_4 and GdB_4

Compound	a in kX	c in kX
UB_4	6.983 ± 0.005	3.930 + 0.003
HoB_4	7.050 ± 0.005	3.992 ± 0.003
GdB_4	7.079 ± 0.005	4.030 ± 0.004

Professor G.S. Zhdanov, Docent M.M. Umanskiy and Doctor of Technical Sciences G.V. Samsonov are thanked for their assistance. There are 1 figure, 1 table and 3 Soviet references.

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

SUBMITTED: April 30, 1957

Card 2/2

70-3-3-26/36

AUTHORS: Zhdanov, G.S., Zhuravlev, N.N., Kuz'min, R.N. and Soklakov, A.I.

TITLE: The Establishment by X-ray Crystallography of a New Compound Bi_3Rh in the System Bi-Rh (Rentgenograficheskoye ustanovleniye novogo soyedineniya Bi_3Rh v sisteme Bi-Rh)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 3, pp 373 - 374 (USSR).

ABSTRACT: Bi_4Rh has been supposed to occur in three polymorphic modifications α, β and γ. Goniometric and X-ray observations have been made on β-Bi_4Rh. Its habit is identical with that of Bi_3Ni and its cell dimensions a=9.1, b=4.2, c=11.4 A are close to those of Bi_3Ni (a=8.875, b=4.115, c=11.477). Both have the space group Pnma = D_{2h}^{16}. $d_{obs.}$ = $= 10.7 \pm 0.2$ gm/cm^3. gives Z nearly equal to 3 if the formula Bi_4Rh is used. It seems clear that the formula should be Bi_3Rh giving z=4 and powder photographs also confirm this resemblance to Bi_3Ni.

Card1/2

70-3-3-26/36

The Establishment by X-ray Crystallography of a New Compound Bi_3Rh in the System Bi-Rh

There are 7 Soviet references.

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

SUBMITTED: July 11, 1957

Card 2/2

78-3-3-36/47

AUTHORS: Zhdanov, G. S., Zhuravlev, N. N., Kuz'min, R. N.

TITLE: An Investigation of the System Bi-Rh (Issledovaniye sistemy Bi-Rh)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol.3, Nr 3, pp.750-754 (USSR)

ABSTRACT: By X-ray analysis some compounds of bismuth and rhodium, especially Bi_4Rh and Bi_2Rh were investigated. The crystals of β-Bi_4Rh and α-Bi_2Rh were investigated. The β-Bi_4Rh-crystals are rhombic and have the following lattice constants: $a = 11,4 \pm 0,2$ Å, $b = 9,0 \pm 0,2$ Å, $c = 4,2 \pm 0,1$ Å. The density of the crystals is $\sigma = 10,7 \pm 0,2$ g/cm^3.
The compound α-Bi_2Rh crystallizes in the monoclinic system with periods $a = 6,7$ Å, $b = 6,8$ Å, $c = 6,9$ Å.
The system CoSb was investigated at the same time and on the basis of X-ray analyses it was found that α-Bi_2Rh and $CoSb_2$ are isomorphous compounds. The crystals α-Bi_2Rh can be classified with the structural type of markasite. During the melt-

Card 1/2

An Investigation of the System Bi-Rh

ing of antimony with cobalt, rhodium and iridium crystals of $CoSb_2$, $RhSb_2$ and $IrSb_2$ were determined. These crystals have a monoclinic structure. The unit cells of the compounds $CoSb_2$, $RhSb_2$ and $IrSb_2$ were calculated by the roentgengonometric method.

$CoSb_2$: a = 6,5 Å, b = 6,5 Å, c = 6,5 Å, $\beta = 118 \pm 1$, $\sigma = 8,3$ g/cm^3, Z = 4

$RhSb_2$: a = 6,6 Å, b = 6,5 Å, c = 6,7 Å, $\beta = 117 \pm 1$, $\sigma = 9,0$ g/cm^3, Z = 4

$IrSb_2$: a = 6,6 Å, b = 6,5 Å, c = 6,7 Å, $\beta = 116 \pm 1$, $\sigma = 10,85$ g/cm^3, Z = 4

$B_{12}Rh$: a = 6,7 Å, b = 6,8 Å, c = 6,9 Å, $\beta = 117 \pm 2$, $\sigma = 12$ g/cm^3, Z = 4

A new group of isomorphous compounds $CoSb_2$, α-RhSb, $IrSb_2$ and α-Bi_2Rh was produced. There are 5 figures, 1 table, and 12 references, 11 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvenny universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 25, 1957

ZHURAVLEV, N.N.; ZHDANOV, G.S.

Study of the bismuth - palladium system. Zhur. neorg.khim. no.3:755 '58. (MIRA 11:4)

(Bibliography—Bismuth-palladium alloys)

AUTHOR: Zhuravlev, N. N. SOV/70-3-4-19/26

TITLE: X-ray Crystallographic Investigation of the γ-phase of the System Bismuth-Palladium (Rentgenograficheskoye issledovaniye γ-fazy sistemy vismut-palladiy)

PERIODICAL: Kristallografiya, 1958, Vol 3, nr 4, pp 503-504 (USSR)

ABSTRACT: The compound Pd_5Bi_3 has been reported (Naturwiss. 1953, Vol 9, p 267) to occur in high and low-temperature modifications the former being of the NiAs type with $a = 4.50 \pm 0.05$ KX and $c/a = 1.29$. It is now shown that from 400-680 °C, the γ-phase has a region of considerable solubility and is therefore not of determinate composition. Below 400 °C, the eutectic decays into two phases BiPd and $BiPd_3$. Monocrystals containing 43.5 wt% Pd were obtained and showed that the γ-phase is hexagonal with $a = 7.75 \pm 0.05$ KX and $c = 5.05 \pm 0.05$ KX. $Z = 16 \pm 1.5$ atoms of Bi and Pd. This is a superstructure with a pseudo-cell corresponding to the one mentioned above. On annealing this specimen of the γ-phase for 8 hours at 250 °C, it decayed to BiPd and the low-temperature form

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X-ray Crystallographic Investigation of the γ-phase of the System Bismuth-Palladium

of $BiPd_3$. This shows that the earlier authors had actually regarded the γ-phase as their high temperature one of composition Pd_5Bi_3 and had mistaken the diagram of $BiPd + BiPd_3$ for one of a low-symmetry modification of Pd_5Bi_3 .

Acknowledgments to Professor G.S. Zhdanov.
There are 3 references, 2 of which are Soviet and 1 German.

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

SUBMITTED: December 18, 1956

24(6) SOV/55-58-5-13/34

AUTHORS: Zhuravlev, N.N., Pak Gvan O., Kuz'min, N.N.

TITLE: Investigation of the Antimony-Rhodium Alloys (Issledovaniye splavov sur'my s rodiyem)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 5, pp 79 - 82 (USSR)

ABSTRACT: It was stated that there result three combinations when melting together antimony and rhodium: $Rh\,Sb_3$, $Rh\,Sb_2$, Rh Sb. $Rh\,Sb_2$ crystallizes in the monoclinic syngony with the periods $a = 6.6 \pm 0.2$ Å, $b = 6.4 \pm 0.2$ Å, $c = 6.7 \pm 0.2$ Å and $\beta = 117^{\circ} \pm 1^{\circ}$. The elementary cell contains 8 antimony- and 4 rhodium atoms. The space group is C_{2h}^5 ($P2_1/c$). The authors use the densities of Rh and Sb according to M.P. Slavinskiy [Ref 11] and crystallographic dates of N.Ye. Alekseyevskiy.

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Investigation of the Antimony - Rhodium Alloys SOV/55-58-5-13/34

There are 3 figures, 1 table, and 12 references, 11 of which are Soviet, and 1 is German.

ASSOCIATION: Kafedra fiziki tverdogo tela (Chair of Physics of Solid Body)

SUBMITTED: April 12, 1958

Card 2/2

SOV/70-3-5-21/24

AUTHORS: Zhuravlev, N.N. and Katsel'son, A.A.

TITLE: An X-ray Diffraction (Powder) Camera for Studying Crystals in the Temperature Interval - 175 °C to +300 °C (Rentgenovskaya kamera dlya issledovaniya kristallov v intervale temperatur - 175 ° - + 300 °C)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 5, pp 632-634 (USSR)

ABSTRACT: An X-ray powder camera of simplified but conventional design is described. A detachable side plate can carry either a tube for blowing cold air evaporated from liquid air in a dewar flask by a submerged heater or a heating coil embedded in a ceramic tube. In each case, the temperature is measured to ± 10 °C by a thermocouple mounted as close to the specimen as possible and a radiation screen protects the film. There is no provision for controlling the atmosphere surrounding the specimen, nor apparently, for adjusting the position of the specimen. As a check, the temperature factor for metallic nickel was measured at 215 °, 20 ° and -175 °C. $B_{(215, -175)}$, $B_{(20, -175)}$ and $B_{(215, 20)}$ had the

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An X-ray Diffraction (Powder) Camera for Studying Crystals in the Temperature Interval -175° to +300° C

experimental values of 0.42, 0.20 and 0.22, as compared with the corresponding theoretical values of 0.43, 0.17 and 0.26.
There are 3 figures, 1 table and 3 Soviet references.

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

SUBMITTED: December 9, 1957

SOV/78-3-9-32/38

AUTHOR: Zhuravlev, N. N.

TITLE: On the Production of Metallic Cesium From Cesium Fluoride (O poluchenii metallicheskogo tseziya iz ftorida tseziya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2210-2211 (USSR)

ABSTRACT: A method of producing metallic cesium by reducing a cesium fluorine compound with metallic magnesium was described. The reduction of cesium fluoride takes place according to the following pattern:

$$2\ CsF + Mg \rightleftharpoons MgF_2 + 2\ Cs$$

The reduction is carried out in a special apparatus of quartz in a high vacuum at a temperature of 580-600°C. A temperature of more than 600°C is to be avoided, as magnesium impurities appear in cesium. The cesium produced can be stored in the vacuum for some time and also under a layer of kerosene for several hours without any noticeable oxidation. Cesium can be purified by double distillation in the vacuum at 250-300°C. The yield of metallic cesium amounts to 70-80% of the quantity theoretically possible.

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On the Production of Metallic Cesium From Cesium Fluoride SOV/78-3-9-32/38

There are 1 figure and 3 references, 2 of which are Soviet.

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

SUBMITTED: March 4, 1958

Card 2/2

AUTHOR: Zhuravlev, N. N. SOV/76-32-6-35/46

TITLE: The Selective Solubility in Bismuth-Platinum Alloys (Izbiratel'noye rastvoreniye v splavakh vismuta s platinoy)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6, pp. 1413-1413 (USSR)

ABSTRACT: Diluted nitric acid is used for the separation of crystals of the intermetallic compound Bi_2Pt of the heterogenous alloy containing Bi, besides it was found that in the case of higher concentrations bismuth dissolves from the compound, a concentration of platinum having been already noticed by Roessler (Ref 1). This way or by means of raising the temperature a highly disperse platinum may be obtained. In the present paper β-Bi_2Pt crystals which crystallize in hexagonal syngony in the form of thin platelets were isolated and from them afterwards the disperse platinum was obtained. Radiographic investigations of the latter showed that the crystals have dimensions of 75-90 Å and that they are analogous to the skeleton nickel catalyst obtained from Ni_2Al_3. The conversion of the platinum atoms into the

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The Selective Solubility in Bismuth-Platinum Alloys SOV/76-32-6-55/46

cubical lattice of platinum on the occasion of the selective dissolution of Bi from Bi_2Pt was also observed by L. M. Kefeli (Refs 4,5) in other alloys where in some cases the formation of intermediate phases occurred. The mentioned way a skeleton platinum catalyst can be obtained; on the other hand it is pointed out that in the separation of monocrystals of intermetallic compounds of bi-phase alloys the possibility of selective solubility must be taken into account. Finally the author thanks G.S. Zhdanov. There are 5 references, 4 of which are Soviet.

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

SUBMITTED: February 27, 1957

1. Bismuth-platinum crystals--Analysis 2. Bismuth--Chemical properties 3. Platinum--Separation 4. Platinum crystals --X-ray analysis 5. Single crystals--Separation

Card 2/2

56-34-4-5/60

AUTHORS: Zhuravlev, N. N., Mingazin, T. A., Zhdanov, G. S.

TITLE: The Structure of Superconductors. XII (Struktura sverkhprovodnikov. XII) The Investigation of Bismuth - Rubidium Alloys (Issledovaniye splavov vismuta s rubidiyem)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 820 - 826 (USSR)

ABSTRACT: According to thermal, microscopical, and radiographic data the test diagram (probnaya diagramma) of the fusibility of the system Bi-Rb is constructed. The investigation of this system is connected with the solution of various methodical problems. The main difficulties mainly are connected with the high chemical activity of metallic rubidium and also with the great difference of the physical-chemical properties of bismuth and rubidium. The whole investigation was performed at small quantities ($\sim 3g$) of rubidium which required the working out of micromethods for the production of the alloys and their physical-chemical analysis. First the production

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of the alloys is discussed, the apparatus used for this are discussed by means of figures. The melting was performed in small resistance furnaces. Then the authors report on the thermal analysis of the alloys. The curves of heating and cooling were taken by an automatic electron potentiometer unto a temperature of 50 - 100°C. The results of the thermal analysis obtained are illustrated in a diagram and subsequently discussed. At the bismuth-rich alloys (to the composition Bi_2Rb) also a metallographical investigation was performed. According to this the number of the crystals of the compound Bi_2Rb increases with increasing rubidium content in the alloy. The alloy with 15,8 per cent by weight rubidium according to its composition resembles the compound Bi_2Rb (17 per cent by weight;)it contains a small quantity of eutectic and is almost homogeneous. In the system Bi-Rb the various phases differ by their color. Then the authors report on the determination of the structure of the superconductive compound Bi_2Rb. By

exact determination of the lattice period of Bi_2Rb the value $a = 9,590 \pm 0,002$ kX was obtained. The distances between the lattice planes, computed from these data agree well with the measured results. The Rb atoms in the structure of the Bi_2Rb are distributed according to the diamond law. Some conclusions are: In the system bismuth-rubidium 4 compounds were stated: Bi_2Rb, $BiRb_3$, and two compounds of the probable composition Bi_2Rb_3 and $BiRb_2$. The maxima in the fusibility diagram correspond to the compounds Bi_2Rb and $BiRb_3$. These compounds form in the fusion of the components with high heat emission. The two other compounds form according to the peritectic reaction. The superconductive compound Bi_2Rb crystallizes in isometric syngony with $a = 9,590 \pm 0,002$ kX and has a structure of the type of Cu_2Mg. The increase of the minimum interatomic distances in the Bi_2Rb leads to an increase of the temperature of the transition into the superconductive state. Finally the author

The Structure of Superconductors. XII. The Investigation of Bismuth-Rubidium Alloys 56-34-4-5/60

thanks Professor N. Ye. Alekseyevskiy for his valuable advice in the performance of this work, and R. N. Kuz'min for his assistance in the performance of the experiments.- There are 6 figures and 10 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 15, 1957

1. Bismuth alloys--Analysis 2. Superconductors--Structural analysis

Card 4/4

AUTHOR: Zhuravlev, N. N. 56-34-4-6/60

TITLE: The Structure of Superconductors. XIII (Struktura sverkhprovodnikov. XIII) Investigation of Bismuth-Cesium Alloys (Issledovaniye splavov vismuta s tseziyem)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 827 - 829 (USSR)

ABSTRACT: According to N. Ye. Alekseyevskiy (Reference 1) various alloys of bismuth with cesium go over into the superconductive state at T = 4,75°K. A bismuth-rich compound of bismuth with cesium seems to be responsible for the superconduction of these alloys. The main problem of this investigation of the system bismuth--cesium was the explanation of the composition and of the atom--crystal structure of this superconductive compound. Because of the high chemical activity of metallic cesium the investigations came across certain difficulties. The author applied the micromethods worked out in one of his previous works (Reference 2). First it is shortly reported on the production of the samples. The curves of heating and cooling are taken by an automatic electron potentiometer unto a temperature of 50-100° C.

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The Structure of Superconductors.XIII. Investigation of Bismuth-Cesium Alloys 56-34-4-6/60

The results of the thermal analysis are plotted in form of a fusibility diagram of the system bismuth-cesium. The melting temperature of bismuth decreases with the increase of the cesium content and reaches a minimum at ~ 250°. The eutectic point is at ~ 1-3 per cent by weight cesium. From the eutectic point onward the curve of fusibility increases and reaches a maximum at ~ 630°C and 24,1 per cent by weight cesium, which corresponds to the compound Bi_2Cs. In case of increasing cesium content the curve of the fusibility decreases. Further details of the fusibility diagram are given and shortly discussed. Then the author reports on the determination of the structure of the superconductive compound Bi_2Cs. The powder röntgenograms were taken for an alloy with ~ 23 weight per cent Cs by a CuK_α-radiation. The investigation performed permits a crystal-chemical analysis of the isomorphic group of the superconductive compounds Bi_2K, Bi_2Rb, and Bi_2Cs. Some conclusions: In the system bismuth-cesium 3 compounds crystallize: Bi_2Cs, $BiCs_3$, and a compound of the probable composition $BiCs_2$. The compounds

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The Structure of Superconductors.XIII. Investigation of Bismuth-Cesium Alloys 56-34-4-6/60

Bi_2Cs and $BiCs_3$ correspond to the maxima in the fusibility diagram and the compound mentioned third forms according to the peritectic reaction. The superconductive compound Bi_2Cs crystallizes in isometric syngony with a = 9,726 ± 0,005 kX and has a structure of the type of Cu_2Mg. The crystal-chemical analysis shows the following: In the isomorphic group Bi_2K, Bi_2Rb and Bi_2Cs increases T_k in case of an increase of the period of the elementary cell. Finally the author thanks the Professor G.S. Zhdanov and N. Ye. Alekseyevskiy for valuable advices and hints in the performance of the work. Besides the author thanks V. A. Smirnov for his assistance in performing the experiments. There are 1 figure and 6 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 15, 1957

Card 3/3 1. Bismuth alloys--Analysis 2. Superconductors--Structural analysis

AUTHORS: Zhuravlev, N.N. and Smirnov, V.A. SOV/70-4-4-10/34

TITLE: X-ray Determination of the Structure of Cs_3Bi

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 4, pp 534-537 (USSR)

ABSTRACT: $CsBi_2$, which is a super-conductor at 4.75 °K, is known to have a Cu_2Mg-type structure with a = 9.746 ± 0.005 Å and minimum interatomic distances of Bi-Bi = 3.44, Bi-Cs = 4.04, Cs-Cs = 4.22 Å. New data on Cs_3Bi is now presented. Cs_3Bi was prepared under vacuum or under decalin by alloying the two elements. The alloy heated to 90 ° could be broken up with a pestle and shaken through a Ni grid into a capillary tube, where it was sealed off. Powder photographs in an 86 mm dia camera showed a cubic cell with a = 9.305 ± 0.006 Å. Cs_3Bi was seen to be isomorphous with Cs_3Sb, the structure of which is known. The space group is $Fd3m - O_h^7$ and there are Cs atoms

Card1/3

X-ray Determination of the Structure of Cs_3Bi

in 8(a) positions and 4Cs + 4Sb in the 8(b) positions. Observed and calculated values of the intensities for Cs_3Bi were compared and agreed satisfactorily.

d_{calc} = 5.01 g/cm^3.

The minimum Bi-Bi distance in Cs_3Bi is 4.03 Å, which is outside the limits within which super-conductivity is found. In both Cs_3Bi and $CsBi_2$, 8 Cs atoms lie in a diamond net in the interstices of which the other atoms are found: in $CsBi_2$, there are tetrahedra of Bi atoms and in Cs_3Bi a statistical arrangement of 4Bi + 4Cs. In both structures the Cs-Bi distances are 4.03 Å but the Bi-Bi distance in $CsBi_2$ is only 3.43 against 4.03 Å in Cs_3Bi.

The change from semiconductivity to super-conductivity can be followed in the series KBi_2, $RbBi_2$, $CsBi_2$

X-ray Determination of the Structure of Cs_3Bi SOV/70-4-4-10/34

as the Bi-Bi distances change. Acknowledgments are made to G.S. Zhdanov.
There are 2 figures, 1 table and 8 references, of which 6 are Soviet and 2 English.

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

SUBMITTED: December 4, 1958

Card3/3

SOV/70-4-4-11/34

AUTHORS: Samsonov, G.V., Zhuravlev, N.N., Paderno, Yu.B. and Melik-Adamyan, V.R.

TITLE: The Synthesis and Properties of Samarium Hexaboride

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 4, pp 538-541 (USSR)

ABSTRACT: SmB_6 was prepared by $Sm_2O_3 + 3B_4C = 2SmB_6 + 3CO$, the $Sm_2O_3 + 3B_4C$ being previously heated as powders to $\sim$ 350 °C and pressed into pellets which were heated in vacuo for 1 hour at 1 000 ° and then 10-15 min at 1 600 °C. An alternative method, $Sm_2O_3 + 15B = 2SmB_6 + 3BO$, was also successful. Heating for 1 hour at 1 650 °C gave SmB_6 in a finer-grained form than did the B_4C method. SmB_6 is dark blue. It was examined in an RKU-114 powder camera and proved to be cubic, with the CaB_6 structure and cell size $a = 4.128 \pm 0.003$ Å. Observed and calculated intensities were compared.

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d_{calc} = 4.85 g/cm^3. The coefficient of emissivity ε_λ was measured at temperatures between 900 and 1 600 °C and took the form:

$$\log \varepsilon_\lambda = c/\lambda \ (1/T - 1/T_\lambda) ,$$

where c is the emissivity of an absolutely black body, and

λ = 650 mμ , decreasing linearly from 0.75 at 900° to 0.68 at 1 600 °C. The maximum observed density of powder specimens sintered at 2 000 °C was 4.79 g/cm^3. The microhardness was 2 500 ± 300 kg/mm^2. The electrical resistance was ~388 μΩ·cm. The thermo e.m.f. was measured between 20 and 700 °C. Between 20 and 60 °C it was found to be 3.4 μV/°C. The melting point under argon was 2 540 °C. The coefficient of thermal expansion from 20 to 800 °C was 6.5×10^{-6}. The work function was 4.4 eV. These physical

The Synthesis and Properties of Samarium Hexaboride

properties are compared with those of the rare earth hexaborides.

There are 3 figures, 1 table and 7 references, of which 5 are Soviet, 1 German and 1 English.

ASSOCIATIONS: Otdel tugoplavkikh soyedineniy Instituta metallo-keramiki i spetsial'nykh splavov AN UkrSSR (Section of Refractory Compounds, Institute of Metallo-ceramics and Special Alloys of the Ac.Sc., Ukrainian SSR
Kafedra fiziki tverdogo tela MGU im. M.V. Lomonosova (Department of Solid-state Physics of Moscow State University imeni M.V. Lomonosov)

SUBMITTED: January 7, 1959

Card 3/3

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68047

AUTHORS: Alekseyevskiy, N. Ye., Zhdanov, G. S., Zhuravlev, N. N.

SOV/55-59-3-15/32

TITLE: The Problem of the Superconductivity of Compounds of Bismuth With Alkali Metals

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 3, pp 113 - 115 (USSR)

ABSTRACT: By analysis of the critical temperature of bismuth-alkali compounds a linear dependence between the critical temperature T_c of the compound and the atomic radius of the alkali metal was found. This linear dependence does not hold for the LiBi compound; it possibly holds for the compounds with alkaline earth metals. A comparison between T_c and the atomic radius is quite permitted for the isomorphic compounds KBi_2, $RbBi_2$, $CsBi_2$, but less for NaBi, which has a different type of lattice. With an increase in the critical temperature T_c the minimum interatomic spacings in the transition from KBi_2 to $CsBi_2$ increase, the dependence between the minimum distance and T_c being linear. By means of a relationship between dH_k/dT and γ (the coefficients

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of the linear term of n-type specific heat), the value of γ for the three isomorphic compounds may be determined from the known value of dH_k/dT. Table 2 contains the values of dH_k/dT and the values of γ calculated from them, which increase from LiBi to $CsBi_2$. In the superconductive bismuth-alkali compounds there is obviously no linear dependence between T_c and γ/v, where v denotes the atomic volume. However, when the dependence $T_c = f(\gamma^{1/3})$ is constructed, the points lie near a straight line passing through the origin of coordinates. There are 1 figure, 2 tables, and 7 references, 5 of which are Soviet.

ASSOCIATION: Kafedra fiziki tverdogo tela (Chair for Solid-state Physics)

SUBMITTED: February 27, 1959

29.7700
5.4130
~~5 (4), 24 (3)~~

68048
SOV/55-59-3-16/32

AUTHORS: Zhuravlev, N. N., Zhdanov, G. S., Alekseyevskiy, N. Ye.

TITLE: The Crystal Chemistry of Superconductive Bismuth Compounds

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 3, pp 117 - 127 (USSR)

ABSTRACT: The present paper deals with some results obtained by an analysis of the crystallo-chemical data found by the authors concerning the structure of superconductive bismuth compounds. A comparison between the superconductive properties with crystallo-chemical data was carried out on the basis of known results determined in most cases by N. Ye. Alekseyevskiy (Refs 20 - 35) at the Institut fizicheskikh problem AN SSSR (Institute for Physical Problems of the AS USSR). The first part of the present paper deals with 1) the capability of bismuth to form compounds with various elements of the periodic system and 2) with the electric properties of these compounds. Among other things the existence of the compounds K_9Bi_7, K_3Bi_2, Rb_3Bi_2, Rb_2Bi, and Cs_2Bi is supposed. It may be that the compounds $CeBi_2$ IrBi and β-LiBi are superconductive. With the

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The Crystal Chemistry of Superconductive Bismuth Compounds 68048 SOV/55-59-3-16/32

of T_c. Bismuth compounds with transition metals show the reverse effect. The minimum interatomic spacings bismuth-bismuth vary within a wide range in the case of the various bismuth compounds. Bismuth compounds with small and also with large bismuth-bismuth spacings are not superconductive, but all compounds in which bismuth-bismuth spacings are within the "optimum" interval (3.1 to 3.8 Å) are superconductive. The superconductive modification of bismuth probably has a face-centered elementary cell. A large table shows the atomic-crystalline structural properties of bismuth compounds with non-superconductive elements. The experiments made by N. B. Brandt (Ref 56) are indicative of a decrease of the anisotropy of the crystal structure of ordinary bismuth in the case of compression. There are 3 figures, 4 tables, and 56 references, 40 of which are Soviet.

ASSOCIATION: Kafedra fiziki tverdogo tela (Chair for Solid-state Physics)

SUBMITTED: February 27, 1959

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24 (8)

AUTHORS: Zhuravlev, N. N., Stepanova, A. A., Zyuzin, N. I. SOV/56-37-3-55/62

TITLE: On the Problem of the Superconductivity of the Compound BiPt

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 880 - 881 (USSR)

ABSTRACT: The critical temperatures for BiPt found by various authors partly differ considerably. Whereas, e.g., according to Matthias, T_c = 1.21 °K, N. Ye. Alekseyevskiy et al. found 2.4 °K, but he also showed that in some BiPt-alloys superconductivity does not occur down to 1.3 °K (Refs 2,3). As shown by reference 4, BiPt crystallizes only in one form viz. hexagonally with the parameters a = 4.20 and c = 5.55 Å (NiAs-structure). Radiographical investigations carried out by the authors of this "Letter to the Editor" gave the same result. Temperature investigations also showed that it crystallizes in NiAs-structure, and the thermal expansion coefficients (parallel and perpendicular to the hexagonal axis) were determined as amounting to $(4.0 \pm 1.0).10^{-6}$ degree^{-1} and $(19.0 \pm 2.0).10^{-6}$ degree^{-1}.

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On the Problem of the Superconductivity of the Compound BiPt

SOV/56-37-3-55/62

The authors investigated several BiPt-alloys of different composition also stoichiometrical ones, and subjected them to different types of thermal treatment. It was, however, found again that in all cases the BiPt-phase in an AuNi-structure crystallizes, and the lattice parameters were determined as amounting to a = 4.315 and c = 5.490 ± 0.005 Å. The alloys were investigated radiographically by means of the powder method, and the maximum change of the volume of an elementary cell was found to amount to ~ 0.8% as against the stoichiometric composition (48.3% by weight Pt). This reduction of the elementary cell was found at 45% by weight Pt. The change of the size of the elementary cell and the herewith connected variation of the distance between two Bi-atoms might be responsible for the variation of T_c; already in a previous paper (Ref 7) it was shown that a decrease of the minimum interatomic Bi-Bi distances leads to an increase of T_c. The authors thank Professor G. S. Zhdanov and N. Ye. Alekseyevskiy for discussions. There are 7 references, 5 of which are Soviet.

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On the Problem of the Superconductivity of the Compound BiPt SOV/56-37-3-55/62

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: June 13, 1959

Card 3/3

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.N. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

PART VI. ALLOYS WITH SPECIAL PHYSICAL PROPERTIES

PART VII. RESOLUTION

AVAILABLE: Library of Congress

Card 8/8

VK/wrc/afm
10/14/60

Zhuravlev, N.N.

ZHURAVLEV, N.N.

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. Kiseina; 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,

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, VNIIIM[illegible], Institut metallurgii AN USSR (Institute of Metallurgy, Academy of Sciences UkrSSR) [illegible], NIICHEM[illegible], MKhTI, Gor'kovskiy politekhnicheskiy institut (Gor'kiy Polytechnic Institute), and Moskovskiy elektrolampovyy zavod (Moscow Electric Bulb Plant). References accompany individual articles.

AVAILABLE: Library of Congress

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JA/dwm/mas
11-18-60

SAMSONOV, G.V.; ZHURAVLEV, N.N.; PADERNO, Yu.B.; SHULISHOVA, O.I.
SEREBRYAKOVA, T.I.

Interaction of gallium, indium, thallium, germanium, tin, and lead with boron. Zhur. strukt. khim. 1 no. 4:458-463 N-D '60.
(MIRA 14:2)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR, Kiyev.

(Boron) (Metals)

24.7100

78111
SOV/70-5-1-20/30

AUTHORS: Zhuravlev, N. N., Smirnov, V. A., Mingazin, T. A.

TITLE: X-Ray Investigation of Compounds Rb_3Bi and Rb_3Sb (Brief Communication)

PERIODICAL: Kristallografiya. 1960, Vol 5, Nr 1, pp 134-137 (USSR)

ABSTRACT: $RbBi_2$, a superconductor, has been known to form cubic crystals with a = 9.609 A and bond lengths Bi-to-Bi 3.40 A; Rb-to-Bi 3.98 A; Rb-to-Rb 4.16 A. Semiconductors Rb_3Bi and Rb_3Sb were produced by melting the mixtures of the respective metals. The obtained products were pure Rb_3Bi, and a mixture of Rb_3Sb crystals with those of RbSb. All are dark-gray, brittle, and chemically more active than metallic Rb. The X-ray data proved the hexagonal symmetry of Rb_3Bi, whose identity periods were a = 6.42 ± 0.02 A and c = 11.46 ± 0.05 A; Rb_3Sb proved also to be hexagonal

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X-Ray Investigation of Compounds Rb_3Bi and Rb_3Sb (Brief Communication)

78111
SOV/70-5-1-20/30

with a = 6.29 ± 0.02A and c = 11.17 ± 0.05 A. Both compounds are isomorph with K_3Bi; their space group is C $6_3/mmc$; 2 mole. wt and 8 atoms per unit cell; density is 3.76 for Rb_3Bi and 3.27 for Rb_3Sb. The bond lengths are: Bi-to-Bi 6.42 A; Bi-to-Rb 3.71A; Rb-to-Rb 3.85 (in Rb_3Bi) and 3.73 A (in Rb_3Sb); Sb-to-Sb 6.29 A; Sb-to-Rb 3.85 (in Rb_3Bi) and 3.73 A (in Rb_3Sb); Sb-to-Sb 6.29A; Sb-to-Rb 3.46 A. Rb atoms form close-packed sheets with Bi or Sb atoms in triangular spaces within the sheet and in body centers of triangular prisms having Rb atoms of adjacent sheets at the vertices and pinacoid centers. A comparison reveals an increase of Bi-to-Bi bond from 3.40 A in $RbBi_2$ to 6.42 A in Rb_3Bi, and decrease of Bi-to-Rb and Rb-to-Rb bonds. These changes are believed to be responsible for the turn of a superconductor to a semiconductor. There are 2 tables; and 7 Soviet references.

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X-Ray Investigation of Compounds Rb_3Bi and Rb_3Sb (Brief Communication)

78111
SOV/70-5-1-20/30

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

SUBMITTED: September 24, 1959

Card 3/3

KUZ'MIN, R.N.; ZHURAVLEV, N.N.; LOSIYEVSKAYA, S.A.

Atomic structure of $RuSb_2$ and $OsSb_2$. Kristallografiia 5 no.2:218-223 Mr-Ap '60. (MIRA 13:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Rubidium antimonide) (Osmium antimonide)

18. 1290
5.2610

82594
S/070/60/005/004/004/012
E132/E360

AUTHORS: Zhuravlev, N.N., Zhdanov, G.S. and Kuz'min, R.N.

TITLE: The Atomic Structure of Certain Compounds of Bismuth and Antimony

PERIODICAL: Kristallografiya, 1960, Vol. 5, No. 4, pp. 553 - 562

TEXT: 1) Alloys of Bi and Sb with alkali and alkaline earth metals.

Bi-Rb[27] has a diagram of state like that of Bi-K. There are two compounds Bi_2Rb and $BiRb_3$ which give maxima in the liquidus. There are probably two other compounds Bi_2Rb_3 and $BiRb_2$ formed in peritectic reactions. The first-mentioned compound Bi_2Rb is superconducting and has the Cu_2Ng structure. The semiconducting compound $BiRb_3$ is hexagonal with a = 6.42, c = 11.46 Å and has the $AsNa_3$ structure.

Bi-Cs[27] shows two compounds Bi_2Cs and $BiCs_3$. $BiCs_2$ is formed in a peritectic reaction. Bi_2Cs is superconducting with the Cu_2Mg

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The Atomic Structure of Certain Compounds of Bismuth and Antimony

structure. $BiCs_3$ is semiconducting and has the $SbCs_3$ structure (cubic) with $a = 9.324$ Å. For the Bi_2K, Bi_2Rb, Bi_2Cs series increasing cell size is linearly accompanied by increasing T_k (temperature of onset of superconductivity). Sb-Rb SbRb has a complex structure and $SbRb_3$ is isomorpouns with $BiRb_3$ and has $a = 6.29$, $c = 11.17$ Å.

Bi-Sr and Bi-Ba. The former is cubic, Cu_3Au type, with $a = 5.042$ Å and the latter is tetragonal with $a = 5.188$ and $c = 5.157$ Å but is isostructural.

2) Alloys of Bi with group 8 transition metals.

Bi-Rh The compounds Bi_2Rh, BiRh and α, β and γ- Bi_4Rh appear to exist but "β-Bi_4Rh" has an orthorhombic cell ($a = 11.52$, $b = 9.03$, $c = 4.24$ Å) and a structure apparently analogous to Bi_3Ni. The composition is therefore probably Bi_3Rh.

82504

S/070/60/005/004/004/012
E132/E360

The Atomic Structure of Certain Compounds of Bismuth and Antimony

α-Bi_2Rh was reported isomorphous with Sb_2Co but this is uncertain.

Bi-Pd The phase diagram is largely known (Zh. Eks. Teor.Fiz., 32, 1305, 1957). The γ-phase near 50% by wt. Pd is hexagonal with a = 7.76, c = 5.86 Å and appears to be a superstructure of NiAs. Below 400 °C there is a eutectic decay to BiPd and $BiPd_3$. It may be Bi_3Pd_5.

Bi-Pt The phase diagram is known. There are the phases α- and β-Bi_2Pt and BiPt. Various differences in the value of T_k reported for BiPt are explained by the possibility of obtaining this compound in a defect state giving a 0.8% volume decrease in the unit cell.

No Bi-rich alloys of Ru, Os and Ir could be prepared.

3) Alloys of Sb with transition metals of group 8.

Sb-Co Besides Sb_2Co and SbCo a new compound Sb_3Co with a cubic As_3Co structure has been found.

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S/070/60/005/004/004/012
E132/E360

The Atomic Structure of Certain Compounds of Bismuth and Antimony

Sb-Rh Three compounds have been found in this system and the general lines of the phase diagram are apparent.
Sb-Ir The existence of Sb_3Ir, Sb_2Ir and SbIr have been established. Sb_3Co, Sb_3Rh and Sb_3Ir are isomorphous. The structures of Sb_2Co, Sb_2Rh and Sb_2Ir are isomorphous and similar to that of α-Bi_2Rh. Such isomorphism does not pertain in the Sb_2M series. The superconducting transition temperatures of the various materials are tabulated and discussed in terms of their cell sizes.
There are 5 figures, 7 tables and 36 references: 5 English, 5 German and 26 Soviet.

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

SUBMITTED: February 23, 1960

Card 4/4

15.2200 1273 1142, 1043

S/180/61/000/001/012/015
E021/E406

AUTHORS: Zhuravlev, N.N., Makarenko, G.N., Samsonov, G.V., Sinel'nikova, V.S. and Tsebulya, G.G. (Kiyev)

TITLE: The Question of the Properties and Phase Composition of Alloys of Boron and Carbon

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.1, pp.133-141

TEXT: The aim of the work was to find a method of preparing relatively pure alloys of boron with carbon and to investigate their physical properties and phase composition. The initial materials were powders of amorphous boron (98.5 to 99.5%) and lamp black (99.8% C). The powders were mixed in alcohol, dried and sieved through 150 mesh. Several methods of preparation were tried, the most acceptable being to hot-press a mixture of the powders in an argon atmosphere in graphite press-formers. Some carburization took place (chemical analyses were made by T.N.Nazarchuk). This could be overcome by using a molybdenum lining but it resulted in contamination with 1.3 to 1.9% molybdenum. Boron nitride linings avoided this contamination. The alloys prepared were examined metallographically, etching by anodic treatment in a

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The Question of the Properties ...

40% KOH solution at 0.9 to 1.2 A/cm^2 and 10 to 20 V. The structures obtained are shown in Fig.1. The alloy with 6.4% carbon had a eutectic structure. At about 8% carbon, the structure was practically single-phased and at 10.2% carbon the whole field appeared as a eutectic. It is proposed that a compound forms at about 8% carbon with the formula $B_{12}C$. A second compound begins to appear at about 10% carbon and is either $B_{13}C_2$ or $B_{12}C_3$. X-ray analysis of the alloys was also carried out and confirmed the metallographic observations. Fig.2 shows the photograph of the phases $B_{12}C$ and B_4C. The B_4C phase had a rhombohedral structure. Between 20.9 and 80% C, the alloy consisted of two phases: the rhombohedral phase, with maximum carbon content in the cell, and graphite. At 61% carbon, an X-ray photograph with a large number of lines, the intensity and position of which did not correspond to B_4C, was obtained. It is proposed that a compound richer in carbon than B_4C exists at high temperatures, which decomposes to B_4C and graphite at low temperatures. Micro-hardness measurements showed that in the unannealed state there is a maximum corresponding to the proposed phase $B_{12}C$ (about 6000 kg/mm^2). After annealing, the hardness curve is smoothed out and the hardness

of $B_{12}C$ was 4000 kg/mm^2 whilst that of B_4C was about 5000 kg/mm^2. Electrical resistance measurements showed that there were sharp maxima at 8 and 21.7% carbon. After annealing, the first maximum was retained although the absolute value decreased; a high maximum was observed at about 15% carbon ($B_{13}C_2$). The resistance of alloys containing more than 30% carbon was low and practically independent of composition. Studies of temperature dependence of resistance of B_4C confirmed the semiconducting character of this carbide (see Fig.5). Thermal e.m.f. measurements showed that the highest values corresponded to defect structures of the compounds $B_{12}C$ and $B_{12}C_3$ deficient in carbon. Two possible variations of the phase diagram of the boron-carbon system at the boron-rich end are given in Fig.4. There are 5 figures, 3 tables and 19 references: 14 Soviet and 5 non-Soviet.

SUBMITTED: August 24, 1960

Card 3/3

24.2148 (1072, 1160, 1395)

S/070/61/006/001/005/011
E032/E314

AUTHORS: Zhuravlev, N.N. and Melik-Adamyan, V.R.

TITLE: A Study of the Crystalline Structure of Superconducting Compounds $SrBi_3$ and $BaBi_3$

PERIODICAL: Kristallografiya, 1961, Vol. 6, No. 1, pp. 121 - 124

TEXT: According to Matthias and Hulm (Ref. 1) $SrBi_3$ and $BaBi_3$ are superconductors having transition temperatures of 5.62 and 5.69 °K. A search of the literature revealed that the structure of these compounds had not been investigated. The present authors have determined the structure of the above compounds from X-ray diffraction photographs (powder method) obtained at room temperature, using Cu and Co radiation. The results for $SrBi_3$ are interpreted on the basis of a cubic lattice with a period of $a = 5.042 \pm 0.002$ Å. This interpretation, taken together with a comparison of X-ray patterns for $CaPb_3$ with those for $SrBi_3$, indicates the

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S/070/61/006/001/005/011
E032/E314

A Study of the Crystalline Structure ....

isomorphism of these compounds (structural type Cu_3Au, sp.gr. $Pm3m - O_h^1$). The Sr and Bi atoms occupy the following positions

Sr 1 : (a) 000

Bi 3 : (c) 1/2 1/2 0; 1/2 0 1/2; 0 1/2 1/2 .

The $BaBi_3$ patterns were interpreted on the basis of a tetragonal cell with the following periods: $a = 5.188 \pm 0.003$ and $c = 5.157 \pm 0.003$ Å . The results obtained for $BaBi_3$ on the basis of this interpretation, taken together with the comparison with X-ray patterns for $SrPb_3$, indicate the isomorphism of these compounds. The appropriate space group is $P4/mmm - D_{4h}^1$. In the case of the $BaBi_3$ compound the Ba and Bi atoms have the following positions

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