KRIPYAKEVICH, P.I.; GLADYSHEVSKIY, Ye.I.

Crystalline structures of compounds rich in beryllium in the systems Mo - Be and W - Be. Kristallografiia 8 no.3:449-451 My-Je '63. (MIRA 16:11)

1. L'vovskiy gosudarstvennyy universitet imeni I.Franko.

L 18097-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG
ACCESSION NR: AP3004096 S/0070/63/008/004/0595/0599

AUTHORS: Kripyakevich, P. I.; Gladyshevskiy, Ye. I.; Zarechnyuk, O. S.; Yevdokimenko, V. I.; Zalutskiy, I. I.; Frankevich, D. P.

TITLE: Some patterns in the crystal chemistry of intermetallic compounds of rare-earth metals

SOURCE: Kristallografiya, v. 8, no. 4, 1963, 595-599

TOPIC TAGS: crystal chemistry, rare earth , morphotropic series, isostructural series, lattice, atomic number

ABSTRACT: The authors have used data from the literature as well as their own experimental work to study the intermetallic compounds of rare-earth metals. The aspects studied include isostructure, morphotropy, dependence of lattice constants on atomic number, and the formation of tertiary compounds. In view of inadequate data on isostructural compounds, the exact character of such series cannot be predicted, but it is thought unlikely that complete isostructural series will be found for the rare earths (i.e., series including all the rare earths). The compounds will most probably form a morphotropic series of identical compositions

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L 18097-63
ACCESSION NR: AF3004096

or a morphotropic series of varying compositions. In most morphotropic series, beginning with some particular rare earth, a certain structural type gives way to another, as occurs at the boundary between the cerium and yttrium groups. Such series are commonly polymorphous. Successive changes in atomic number lead in some series to changes in both composition and structure. The atomic radius, which does not change consistently with increase in atomic number, is an effective characteristic in determining isostructural and morphotropic series. Compounds of certain structural types that are absent in double systems may show up in tertiary or quaternary systems. An example is the existence of compounds of $Th_2Zn_{17}$ and $ThMn_{12}$ in the system Ce-Mn-Al, although they are absent in the system Ce-Mn. They exist in the related double systems Ce-Fe and Th-Mn. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: L'vovskiy gosudarstvenryy universitet im. I. Franko (L'vov State University)

SUBMITTED: 14Mar63 DATE ACQ: 15Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 014 OTHER: 007

Card 2/2

GLADYSHEVSKIY, Ye.I.; KRIPYAKEVICH, P.I.; FRANKEVICH, D.P.

Crystalline structure of rare earth metal compounds containing beryllium($RBe_{13}$). Kristallografiia 8 no.5:788-789 S-O '63. (MIRA 16:10)

1. L'vovskiy gosudarstvennyy universitet im. I.Franko.

GLADYSHEVSKIY, Ye.I.; TELEGUS, V.S.; MARKIV, V.Ya.

Crystalline structure of the compound $Ta_5Ga_3$. Kristallografiia 8 no.6:921-923 N-D'63. (MIRA 17:2)

1. L'vovskiy gosudarstvennyy universitet imeni Iv. Franko.

L 12598-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3003479 S/0078/63/008/007/1673/1677

AUTHOR: Altunina, L. N.; Glady*shevskiy, Ye. I.; Zarechnyuk, O.S.; Kolobnev, I. F.

TITLE: Physico-chemical analysis of the system Al-Si-Ce in the region of 0-73% by weight of Ce

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 7, 1963, 1673-1677

TOPIC TAGS: Al, Si, Ce, x-ray analysis

ABSTRACT: The joint solubility of silicon and cerium in aluminum is studied. In equilibrium with a solid solution of the aluminum-base alloy, there is besides Si and $Al_4Ce$, a compound X and a solid solution of aluminum in $CeSi_2$. The approximate composition of compound X is 35 at. % Al, 45 at. % Si, 20 at. % Ce (19 w % Al, 25 w % Ce). X-ray analysis of the solid solution Ce (Si, Al)$_2$ indicated that its structure is related to type Alpha-$ThSi_2$. Maximum content of aluminum in solid solution Ce(Si,Al)$_2$ is 20-22 w%. Orig. art. has: 6 figures.

Card 1/2 Lvov State Univ.

L 17428-63 EWP(q)/EWT(m)/BDS AFFTC/ASD Pad JD/EM

ACCESSION NR: AP3004349 S/0078/63/008/008/1915/1920

AUTHORS: Glady*shevskiy, Ye. I.; Borusevich, L. K. 59 58

TITLE: Ternary system Cr-Ni-Si

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 8, 1963, 1915-1920

TOPIC TAGS: Cr, Ni, Si, chromium, nickel, silicon

ABSTRACT: Authors studied a ternary phase equilibrium system of chromium-nickel-silica. Phase equilibrium findings are shown in a diagram in the form of an isothermal cross section of the Cr-Ni-Si system at 850C. Authors found that the alloys have three additional ternary systems besides the two intermetallic ternary systems found previously in the presence of large amounts of silica. These freshly-found ternary systems are in the $T$, $\tau_1$ and $\tau_2$ phases. X-ray and microstructural methods confirm that the composition of the $T$ phase belongs to the structure of the $Mg_6Cu_{16}Si_7$ type. The alloys containing about 1% of H by weight

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L 17428-63

ACCESSION NR: AP3004349

In a $Cr_3Ni_3Si$ composition have a composition ($\eta'$ phase) which corresponds to a structure of the $Ti_2Ni$ or $W_3Fe_3C$ type. "The authors express their gratitude to P. I. Kripyakevich for his interpretation of the results." Orig. art. has: 2 figures and 3 tables.

ASSOCIATION: L'vovskiy gosudarstvenny*y universitet im. Iv. Franko (Lvov state university)

SUBMITTED: 11Oct62 DATE ACQ: 21Aug63 ENCL: 00

SUB CODE: CH NO REF SOV: 011 OTHER: 007

Card 2/2

L 14955-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/HW-2/JG

ACCESSION NR: AP3004356 S/0078/63/008/008/1997/1998

AUTHOR: Glady*shevskiy, Ye. I.; Popova, N. M.; Fedorov, T. F.

TITLE: Mutual solubility of zirconium, niobium, and hafnium carbides

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 8, 1963, 1997-1998

TOPIC TAGS: zirconium carbide-niobium carbide-hafnium carbide mutual solubility, phase composition, crystal lattice, lattice parameter, alloy microstructure, zirconium carbide, niobium carbide, hafnium carbide, zirconium carbide-niobium carbide-hafnium carbide system, mutual solubility, zirconium carbide-niobium carbide-hafnium carbide alloy

ABSTRACT: The mutual solubility of components of the ternary ZrC-NbC-HfC system has been investigated. Alloys were prepared by melting of sintered compacts in an unconsumable-electrode arc furnace in an argon atmosphere and annealing in vacuum at 2000C for 50 hr. The x-ray diffraction analysis showed that all three components have unlimited mutual solubility. The lattice parameter increases continuously with increasing content ZrC and HfC (see Table 1 and Fig. 1 of Enclosures). Orig. art. has: 3 figures and 1 table.

Card 1/4

SAVITSKIY, Ye.M.; BARON, V.V.; YEFIMOV, Yu.V.; GLADYSHEVSKIY, Ye.I.

Investigating the structure and properties of some alloys in the system vanadium - niobium - silicon. Trudy Inst. met., no.12:166-178 '63. (MIRA 16:6)

(Vanadium-niobium-silicon alloys—Metallography)
(Phase rule and equilibrium)

Gladyshevskiy, Ye. I.

Yu. B. Kuzma, Ye. I. Gladyshevskiy, and Ye. Ye. Cherkashin. Physicochemical investigation of the Nb-Co-Si system.

Title: Seminar on refractory metals, compounds, and alloys (Kiev, April 1963).

Source: Atomnaya energiya, v. 15, no. 3, 1963, 266-267

L 2501-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG/MLK

ACCESSION NR: AT4048706 S/0000/64/000/000/0149/0150

AUTHOR: Gladyshevskiy, Ye. I.; Krypyakevich, P.I.; Frankevich, I.P.

TITLE: X-ray studies of the structure of alloys of rare earth metals and yttrium with beryllium

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 149-150

TOPIC TAGS: rare earth metal alloy, yttrium alloy, beryllium alloy, x-ray analysis, lattice constant, rare earth metal valence, crystal structure

ABSTRACT: These studies dealt with beryllium-rich alloys (92.3 at. % Be) with all the rare earth metals except Pm and Gd, prepared from highly purified metals in a Tammman furnace in argon. Compounds of the $NaZn_{13}$ type were found in each system. The lattice constants are reported. The value "a" was lower for $CeBe_{13}$ than for $PrBe_{13}$, while that for $EuBe_{13}$ and $YbBe_{13}$ was intermediate between the corresponding values of the adjoining elements. This proves that the cerium atoms in the beryllium crystals have a tendency to form $R^{+4}$ ions (similar to compounds with the transition metals) while europium

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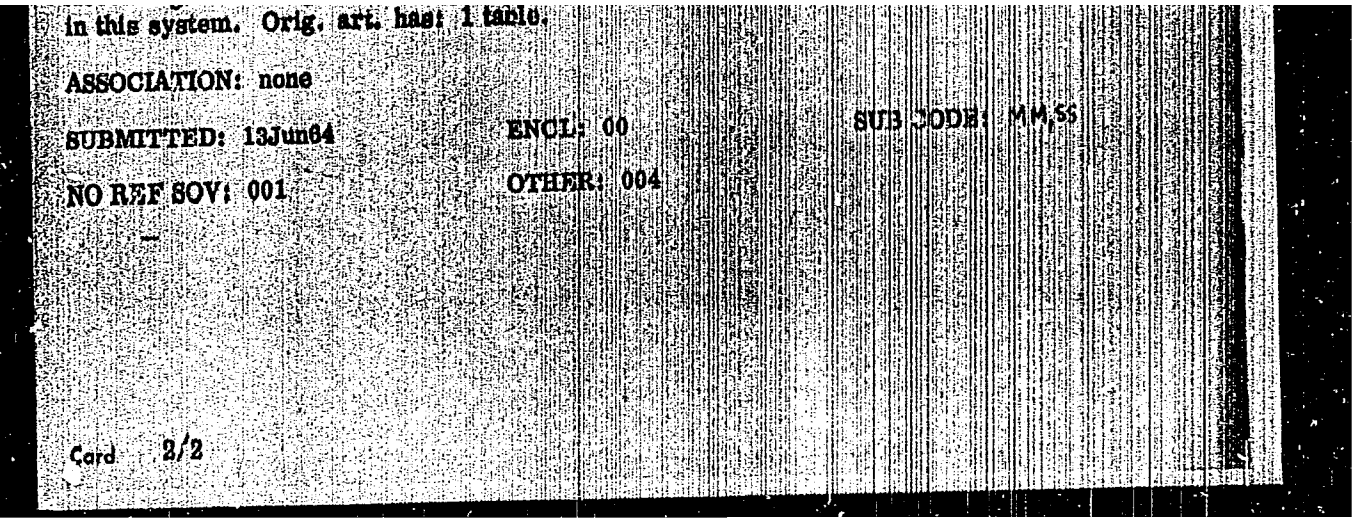
and ytterbium tend to $R^{+3}$ ion formation. Thus the behavior of beryllium in alloys with rare earth metals differs from that of Mg, Al, Si and Ge, in which Ce forms $R^{+3}$ and Lu and Yb form $R^{+2}$ ions. Data found in the literature on the crystal structure of these systems are reported. A phase diagram (not shown) was plotted only for the system Y-Be. According to the diagram, $YBe_{13}$, formed immediately from the melt, is the sole compound



in this system. Orig. art. has: 1 table.

ASSOCIATION: none

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: MM,SS

NO REF SOV: 001 OTHER: 004

Card 2/2

L 14772-65 EWT(m)/EWP(b) ASD(f)-2/ESD(ga) RDW/JD/JG/MLK

ACCESSION NR: AT4048708 S/0000/64/000/000/0153/0154

AUTHOR: Glady*shevskiy, Ye. I.; Kripyakevich, P. I.; Kuz'ma, Yu. B.; Protasov, V. S.

TITLE: Double compounds of scandium with transition metals and beryllium

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1962. Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 153-154

TOPIC TAGS: scandium, scandium beryllium compound, beryllium, rare earth element, transition element

ABSTRACT: Since data on only 10 Sc alloys with Mn and elements of the Fe, Co and Ni groups had been published by 1962, the authors investigated several scandium alloys containing Mn, Fe, Co, Ni, Cr and Re. They were prepared from scandium (98.2% Sc, 0.1% rare earth metals, 0.69% Cu, 0.038% Fe, 0.036% Cr, 0.009% Mo), electrolytic manganese and copper, iron carbonyl, cobalt, nickel and rhenium (99.8% Re). The alloy was melted in an arc furnace or Tamman furnace in $Al_2O_3$ crucibles (in pure helium). X-ray analysis revealed the existence of $ScMn_2$, $ScCo_2$ and $ScNi_2$. For $ScFe_2$, a $MgCu_2$ type structure was observed. Consequently, $ScFe_2$

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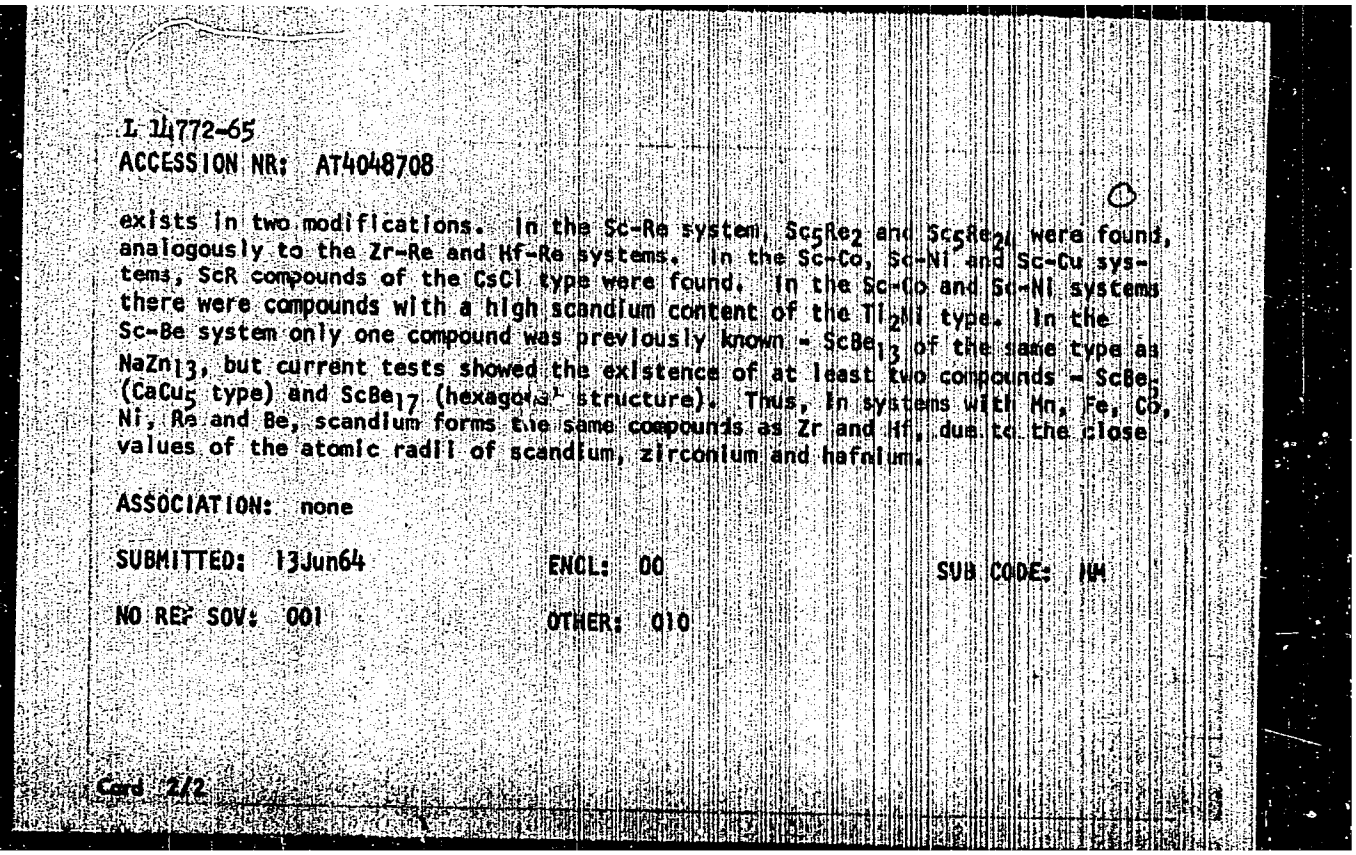

L 14772-65
ACCESSION NR: AT4048708

exists in two modifications. In the Sc-Re system, $Sc_5Re_2$ and $Sc_5Re_{24}$ were found, analogously to the Zr-Re and Hf-Re systems. In the Sc-Co, Sc-Ni and Sc-Cu systems, ScR compounds of the CsCl type were found. In the Sc-Co and Sc-Ni systems there were compounds with a high scandium content of the $Ti_2Ni$ type. In the Sc-Be system only one compound was previously known - $ScBe_{13}$ of the same type as $NaZn_{13}$, but current tests showed the existence of at least two compounds - $ScBe_5$ ($CaCu_5$ type) and $ScBe_{17}$ (hexagonal structure). Thus, in systems with Mn, Fe, Co, Ni, Re and Be, scandium forms the same compounds as Zr and Hf, due to the close values of the atomic radii of scandium, zirconium and hafnium.

ASSOCIATION: none

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: IM

NO REF SOV: 001 OTHER: 010

Card 2/2

L 03875-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b)/EWA(b) Pab I.P(c)
JD/JG/MLK
ACCESSION NR: AT5002772 S/0000/64/000/000/0168/0169

AUTHOR: Kuz'ma, Yu. B.; Lakh, V.I.; Stadnyk, B.I.; Gladyshevskiy, Ye. I.

TITLE: Xray structural analysis of alloys of the system W - Re - C

SOURCE: Vsesoyuznoye soveshchaniye po probleme reniya. 2d, Moscow, 1962. Reniy (Rhenium); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 168-169

TOPIC TAGS: rhenium, rhenium alloy, rhenium alloy structure, xray structural analysis, tungsten alloy, alloy carbon content, tungsten rhenium thermocouple, cast rhenium alloy, tungsten carbide

ABSTRACT: The system W - Re - C was studied in order to elucidate the influence of carbon on the composition and properties of tungsten-rhenium thermocouples, which have recently come into widespread use. Cast alloys containing up to 40 at. % carbon, quenched after annealing at 2500, 2000, 1500, 1000, 800C, were subjected to x-ray analysis. The phase equilibria were established, and the corresponding isothermal sections were constructed. The negative influence of a carbon-containing atmosphere on the stability of tungsten-rhenium thermocouples (increase in brittleness) is attributed to the formation of a carbide corresponding to a continuous series of solid solutions

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L 23875-65

ACCESSION NR: AT5002772

formed between Re and $\alpha$-$W_2C$, which were stable at all the investigated temperatures. An increase in lattice constants was observed in passing from Re to $\alpha$-$W_2C$. The compound $W_3Re_2O$ was identified; in cast alloys and alloys annealed at 2500 and 2000C, it was found to be in equilibrium with the continuous solid solution between Re and $\alpha$-$W_2C$, with the solid solution based on W, and with the $\sigma$ phase of the system W - Re. At 1500, 1000, and 800C $W_3Re_2C$ is also in equilibrium with the $\chi$ phase of the system W - Re. The ternary carbide (W, Re) C ($\omega$ phase) was identified at temperatures above 2500C.

ASSOCIATION: none

SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: MM

NO REF SOV: 000 OTHER: 001

Card 2/2

L 23612-65 EWT(m)/EWP(t)/EWP(b) Pad LJP(c) JD/HM/JG/MLK
ACCESSION NR: AT5002773 S/0000/64/003/000/0170/0170

AUTHOR: Gladyshevskiy, Ye. I.; Kuz'ma, Yu. B.

TITLE: Phase analysis of the ternary systems Re - Fe (Co, Ni) - Si

SOURCE: Vsesoyuznoye soveshchaniye po probleme reniya. 2d, Moscow, 1962. Reniy (Rhenium); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 170

TOPIC TAGS: rhenium, rhenium alloy, ternary rhenium alloy, iron containing alloy, cobalt silicide, nickel silicide, alloy phase analysis, xray structural analysis, rhenium alloy microstructure

ABSTRACT: X-ray structural and microstructural analysis was used to study the phase transformations and crystal structures of the phases in the systems Re - Fe - Si, Re - Co - Si, and Re - Ni - Si, using alloys annealed at 800C. In the first two systems,

in which ternary compounds are formed. This difference is apparently due to the

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L 23612-65

ACCESSION NR: AT5002773

differences in the electron configuration of manganese and rhenium.

ASSOCIATION: none

SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 000

L 23613-65 EWA(k)/EWT(l)/EWT(m)/EPF(n)-2/EEC(t)/EWP(t)/EWP(b) Pu-4 IJP(c)
JD/JG/MLK

ACCESSION NR: AT5002774 S/0000/64/000/000/0171/0171

AUTHOR: Borusevich, L.K.; Gladyshevskiy, Ye. I.

TITLE: X-ray structural study of alloys of the system Mo - Re - C

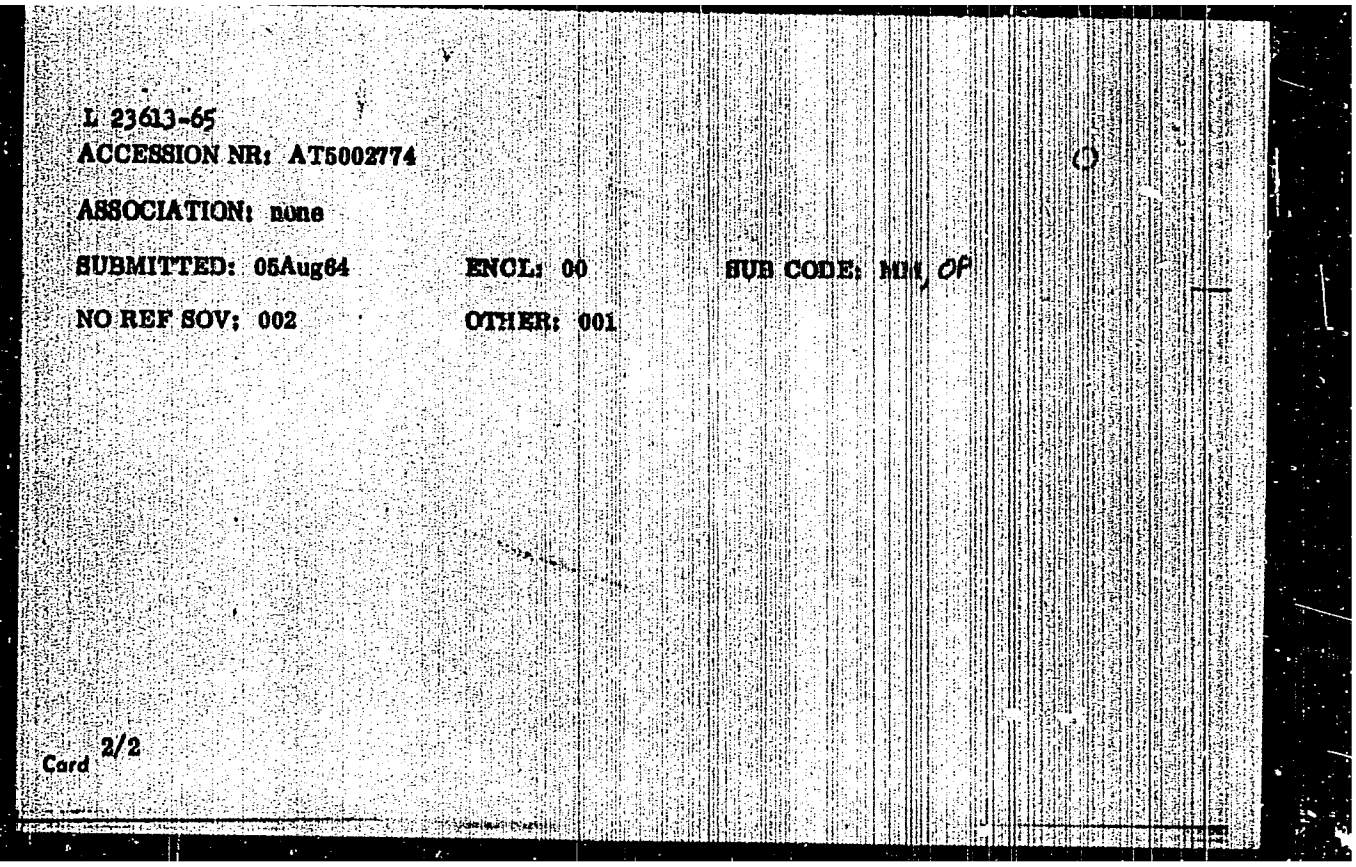
SOURCE: Vsesoyuznoye soveshchaniye po probleme reniya, 2d, Moscow, 1962. Renty (Rhenium); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 171

TOPIC TAGS: rhenium, rhenium alloy, xray structural analysis, rhenium alloy microstructure, molybdenum alloy, carbon content, cast rhenium alloy, molybdenum carbide

ABSTRACT: The authors studied the phase equilibria in the ternary system Mo - Re - C, using 25 alloys prepared from electrolytic rhenium (99.6% Re), molybdenum (99.97% Mo), and carbon black. Two ternary compounds were identified in the cast alloys obtained: $Mo_3Re_2C$, having a structure of the $\beta$-Mn type, and (Mo, Re)C, of NaCl-type structure, containing from a few to 40 at. % Re. The compound $Mo_2C$ and Re form a continuous series of solid solutions with a gradual change in lattice constant. This series is made possible by the isostructural character of $Mo_2C$ and Re. Results of the investigation of the system Mo - Re - C show that it is closely related to the system W - Re - C, which had been studied earlier.

PURE METAL

Card 1/2



L 23613-65
ACCESSION NR: AT5002774
ASSOCIATION: none
SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: NP, OP
NO REF SOV: 002 OTHER: 001

Card 2/2

ACCESSION NR: AP4012588 S/0021/64/000/002/0209/0212

AUTHOR: Glady*shovs'ky*y, Ye. I.

TITLE: Crystal structure of EuGe sub 2

SOURCE: AN UkrRSR. Dopovidi, no. 2, 1964, 209-212

TOPIC TAGS: metal, alloy, steel, europium, germanium, Eu Ge sub 2, X-ray diffraction, crystal structure, Cd I sub 2, Ce Cd sub 2

ABSTRACT: The crystal structure of the compound $EuGe_2$ was investigated by the X-ray diffraction method. It was established that this Ge-richest compound of Eu with Ge has a structure of a new type/space group $P\bar{3}m1 - D^3_{3d}$; 1 Eu in 1 (a), 2 Ge in 2(d) with $z = 0.405 \pm 0.005$, $a = 4.102 \pm 0.003$ A, $c = 4.995 \pm 0.003$ A, $c/a = 1.218$/related to the $AlB_2$ type. The symmetry of the $EuGe_2$ structure and the point systems occupied in it are the same as for $CdI_2$; however, in view of the fact that the coordination properties of these three structures differ from each other considerably, they should not be regarded as belonging to the same

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ACCESSION NR: AP4012588

structural type. Orig. art. has: 1 figure and 2 tables.

ASSOCIATION: L'vivs'ky*y Derzhavny*y Univerdy*tet (L'vov State University)

SUBMITTED: 23Feb63 DATE ACQ: 03Mar64 ENCL: 00

SUB CODE: ML, EL NO REF SOV: 004 OTHER: 005

Card 2/2

ACCESSION NR: AP4044906 S/0226/64/000/004/0015/0020

AUTHOR: Gladyshevskiy, Ye. I., Lakh, V.I., Skolozdra, R.V., Stadnyk, B.I.

TITLE: A study of the mutual solubility of disilicides of the transition metals belonging to groups IV, V, and VI

SOURCE: Poroshkovaya metallurgiya, no. 4, 1964, 15-20

TOPIC TAGS: silicide, disilicide, transition element, silicide solubility, solid solution, powder metallurgy

ABSTRACT: At the present time, the practical significance of the disilicides of the transition metals is constantly increasing, and great attention is being given to their investigation. The mutual solubility of the disilicides of transition metals belonging to groups IV, V, and VI has been investigated particularly thoroughly. Thus, of 36 possible binary systems, 20 were investigated earlier. The present authors have reduced the gap still further by investigating the systems $TiSi_2$ - $CbSi_2$, $VSi_2$ - $CrSi_2$, $VSi_2$ - $WSi_2$, $ZrSi_2$ - $CbSi_2$, $ZrSi_2$ - $WSi_2$, $CbSi_2$ - $MoSi_2$, $CbSi_2$ - $TaSi_2$, and $CbSi_2$-$WSi_2$, omitting only the scarce disilicides of hafnium. Radiographic and micrographic methods, as well as microhardness measurements, were used. The specimens were prepared by fusion of

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ACCESSION NR: AP4044906

high purity metals (content of basic metal not less than 99.5%) with silicon (99.99%) in an electric arc furnace with a watercooled copper base, using non-consumable tungsten electrodes and a helium atmosphere, and were annealed at 800C for 1500 hours. Powdergraphs taken in cylindrical chambers (d=57.3 mm) under Cr-K radiation were used for radiographic phase analysis, and lattice constants were determined by the method of Preston in a chamber 86.4 mm in diameter. Samples were etched in mixtures of concentrated hydrofluoric and nitric acids. Microhardness was determined with a PMT-3 hardness meter having an accuracy of + 25 dan/mm$^2$ (1 dan/mm$^2$ = 1.02 kg/mm$^2$). All the investigated sections $Me^{I}Si_2$ - $Me^{II}Si_2$ of the ternary systems $Me^{I}$ - $Me^{II}$-Si proved to be pseudo-binary with limited or continuous solubility between the silicides. A summary of the results with regard to the mutual solubility of the disilicides is given in Fig. 1 of the Enclosure. Continuous series of solid solutions formed in two of the eight systems ($VSi_2$ - $CrSi_2$ and $CbSi_2$ - $TaSi_2$). Like the other series known, these were formed between isostructural disilicides of metals which are very close neighbors in the periodic system (elements of one group, Cb-Ta, or of one period, V-Cr). In the six remaining disilicide systems, limited solid solutions were formed, consisting of non-isostructural compounds. The greatest mutual solubility was exhibited by disilicides

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ACCESSION NR: AP4044906

for which the values $$F=\frac{\gamma Me^{I}-\gamma Me^{II}}{\gamma Me^{I}}\cdot 100, \quad (1)$$

were the smallest, where $\gamma Me^{I} < \gamma Me^{II}$; these were $TiSi_2$—$NbSi_2$ ($F$=0.7%); $CbSi_2$ - $MoSi_2$ (F=4.3%), $CbSi_2$-$WSi_2$ (F=3.6%), and $VSi_2$-$WSi_2$ (F=4.5%).

With an increase in the F-value, the reciprocal solubility decreased sharply: $ZrSi_2$ - $CbSi_2$ (F = 10.3) and $ZrSi_2$ - $WSi_2$ (F = 14.3%).

"M.I. By*chkova and S.A. Bakuta, as well as the students T.G. Fedoruk, A.A. Kulikova, L.A. Ly*senko, O.Ye. Slezko and G.I. Bova, participated in the investigations." Orig. art. has: 1 table and 7 figures..

ASSOCIATION: L'vovskiy gosuniversitet im. Iv. Franko (L'vov State University)

SUBMITTED: 02Jan63 ENCL: 01 SUB CODE: MM, IC

NO REF SOV: 001 OTHER: 010



APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010002-3"

ACCESSION NR: AP4037443 S/0021/64/000/005/0600/0603

AUTHOR: Kuz'ma, Yu. B.; Shurin, A. K.; Dmy*triyeva, G. P. (Dmitriyeva, G. P.); Glady*shevs'ky*y, Ye. I. (Glady*shevskiy, Ye. I.)

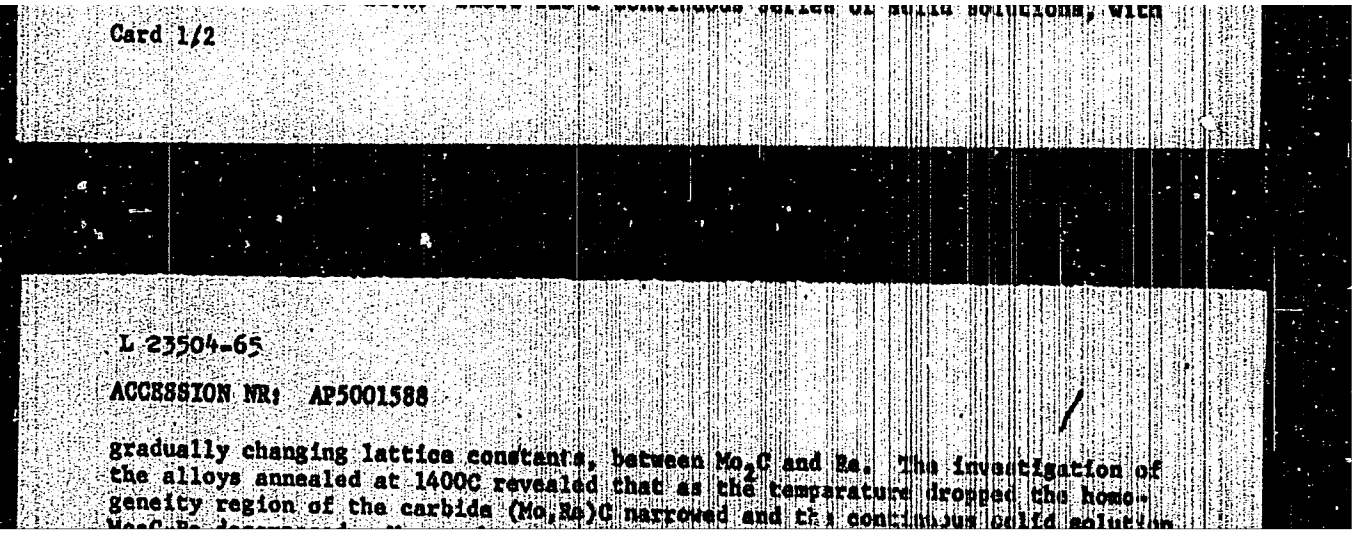
TITLE: Crystal structure of the beta-phase of the niobium-cobalt system and the solubility of silicon in it

SOURCE: AN UkrRSR. Dopovidi, nò. 5, 1964, 600-603

TOPIC TAGS: niobium-cobolt system, beta-phase, beta-phase stabilization, x-ray analysis, space group D sup 4 sub 6h, space group P6 sub 3/mmc, MgZn sub 2 structure, niobium-cobalt-silicon system

ABSTRACT: X-ray analysis was used to establish that the beta-phase of the niobium-cobalt system, existing over the temperature interval 1440-1225C, has the $MgZn_2$ structure (space group $P6_3/mmc$ -- $D^4_{6h}$) with lattice parameters a = (4.834 ± 0.002) A, c = (7.853 ± 0.004) A, c/a = 1.624 for the alloy containing 35.1 atomic % Nb. The beta-phase had been studied earlier by two of the authors,

Card 1/2



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L 23504-65

ACCESSION NR: AP5001588

gradually changing lattice constants, between $Mo_2C$ and Re. The investigation of the alloys annealed at 1400C revealed that as the temperature dropped the homogeneity region of the carbide (Mo,Re)C narrowed and the continuous solid solution

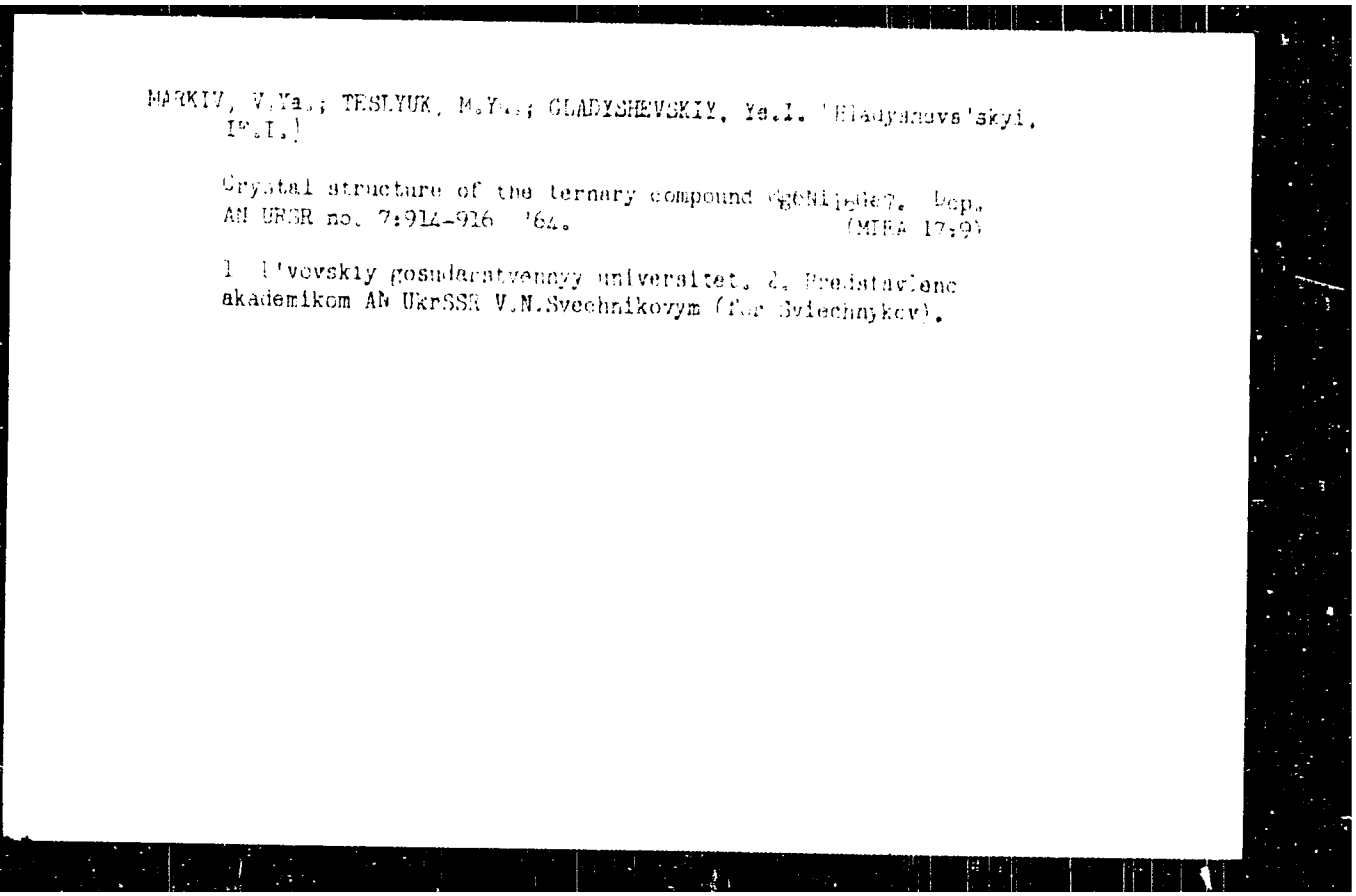
found. Orig. art. has: 2 tables and 4 figures.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Iv. Franko (Lvov state university)

SUBMITTED: 25Sep63 ENCL: 00 SUB CODE: MM

NO REF SOV: 005 OTHER: 009

Card 2/2



MARKIV, V.Ya.; TESLYUK, M.Yu.; GLADYSHEVSKIY, Ye.I. [Hladyshevs'kyi, Ye.I.]

Crystal structure of the ternary compound $Y_6Ni_{16}Si_7$. Dop. AN URSR no. 7:914-916 '64. (MIRA 17:9)

1. L'vovskiy gosudarstvennyy universitet. 2. Predstavlene akademikom AN UkrSSR V.N.Svechnikovym (for Svechnykov).

L 19629-65 EWT(m)/EWP(t)/EWP(b) APETR/ASD(a)-5/AFWL/AS(mp)-2/ESD(gs)/IJP(c) JD/JG

ACCESSION NR: AP4045902 S/0021/64/000/009/1177/1179

AUTHOR: Dayana, D. I.; Markiv, V. Ya.; Glady*shevs'ky*ye, Ye. I. (Gladyshevskiy, Ye. I.)

TITLE: Crystal structure of the compound $EuGa_2$

SOURCE: AN UkrRSR. Dopovidi, no. 9, 1964, 1177-1179

TOPIC TAGS: europium gallide, aluminum boride, crystal structure, crystal structure analysis, crystal lattice

ABSTRACT: The intention of the authors was primarily to investigate $RGa_2$ alloys in the systems Eu, Tu, Yb, Lu; they were prepared in crucibles in the presence of $Al_2O_3$ in a Tammann furnace under an atmosphere of purified argon. The thermal treatment was carried out at a constant temperature of 400°C, followed by tempering in cold toluene. X-ray and microscopic examination disclosed that $EuGa_2$ has a near-homogeneous microstructure and a hexagonal crystal structure, with c/a = 1.04, which is characteristic of compounds of the $AlB_2$ type. The examination also showed the existence of four compounds: $Eu_2Ga_3$, $EuGa_2$, $Eu_2Ga_5$, and $EuGa_{3.5}$. $EuGa_2$ has the following structure: $P6/mmm-D_{6h}^1$, a = 4.345 ± 0.003 A, c = 4.520 ± 0.003 A, c/a = 1.040. Orig. art. has: 2 tables.

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L 19629-65

ACCESSION NR: AP4045902

ASSOCIATION: L'vivs'kyy derzhavnyy universytet (L'vov State University)

SUBMITTED: 08Aug63 ENCL: 00 SUB CODE: SS, MM

NO REF SOV: 000 OTHER: 004

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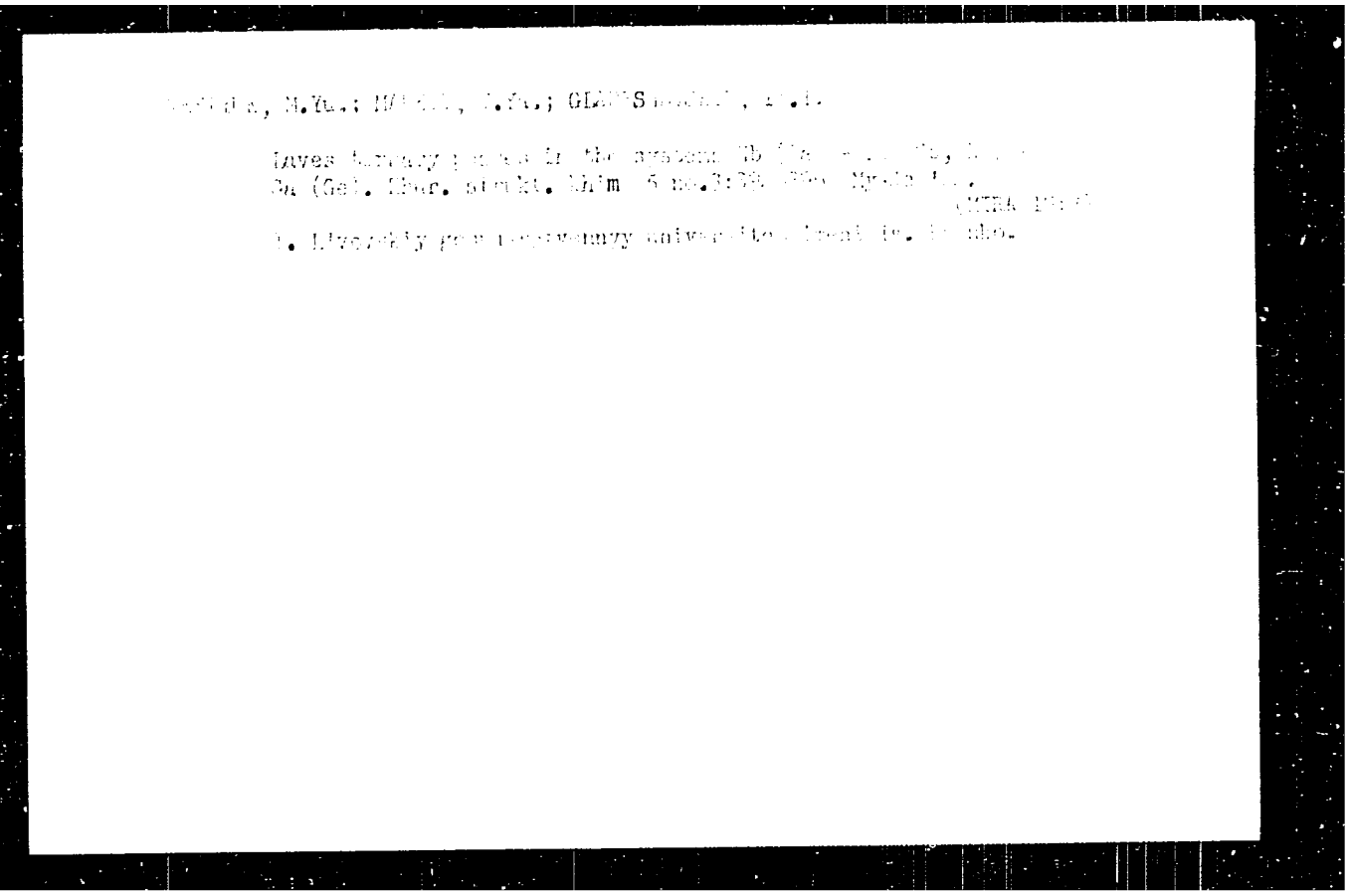

L 6771-65 EWT(m)/EPF(n)-2/EWP(c)/EWP(b) Pad/Pu-4 ASD(a)-5/ASD(m)-2/AFWL/
ASD(f)/ASD(m)-3/RAEM(t) JD/HM/JG

ACCESSION NR: AP4044273 S/0192/64/005/004/0562/0567

AUTHOR: Kuz'ma, Yu. B.; Glady*shevskiy, Ye. I.; By*k, O. S.

TITLE: Crystal structures of some ternary compounds in the Nb-Co-Si system

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 4, 1964, 562-567

TOPIC TAGS: niobium, cobalt, silicon, phase diagrams, crystal structure, x-ray diffraction, ternary compound

ABSTRACT: This work was undertaken in order to investigate the ternary compounds in the Nb-Co-Si system and in particular to study in detail the compound Nb$_x$Co$_y$Si$_z$. Because the phase diagram of the Nb-Co system in the Nb rich

melted in aluminum crucibles in a hydrogen atmosphere by [illegible]

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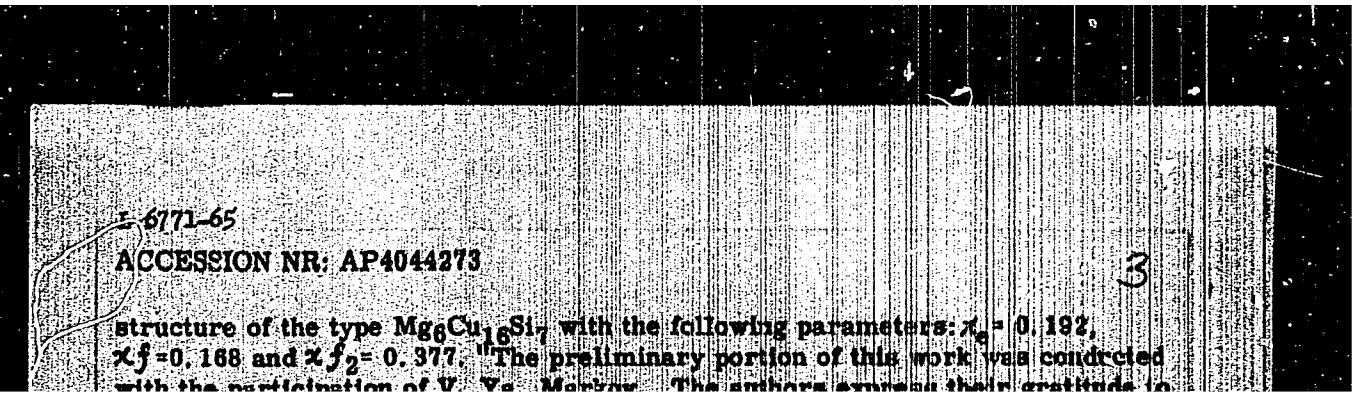
L 6771-65
ACCESSION NR: AP4044273

furnace. X-ray structural analysis was conducted by the powder method using chromium radiation and 57.3 mm diameter camera. The lattice constant of compounds were determined by photographing the reciprocal lattice in the Preston's camera, using silver as a standard. The microstructural analysis were conducted with a MIM-6 microscope. A mixture of concentrated nitric and hydrofluoric acids were used for etching the specimens in order to bring out the microstructure. The x-ray pattern of homogenious $Nb_3Co_2Si$ alloy was indexed as the face-centered cubic lattice. The lattice constant $a = 11.196 \pm 0.003$ Å. The structural symmetry composition and the magnitude of the lattice constant indicate the possibility of structure of the $Mn_3Ni_2Si$ type. The calculated and observed intensities are in good agreement indicating the structure. The x-ray pattern of almost homogenious $Nb_2Co_3Si$ alloy was indexed on hexagonal syngony when c/a=1.62. The absence of 00l and hhl with odd l indicates the space group $P6_3/mmc D_{6h}^4$, which includes $MgZn_2$ type structure and its superstructure $Mg_2Cu_3Si$. Precise determination of lattice constants yields $a = 4.794 \pm 0.002$, $C = 7.760 \pm 0.003$ Å, $c/a = 1.619$. $Mg_2Cu_3Si$ type structure of $Nb_2Co_3Si$ ($\lambda_1$ phase) was indicated by intensity calculations. It was found that $Nb_6Co_{1.6}Si_{1.4}$ has a





ACCESSION NR: AP4044273

structure of the type $Mg_6Cu_{16}Si_7$ with the following parameters: $\chi_e$ = 0.192, $\chi f$ = 0.168 and $\chi f_2$ = 0.377. The preliminary portion of this work was conducted with the participation of V. Ye. Marinov. The authors express their gratitude to

P. I. Kripyakevich for the discussion of this work. Orig. art. has: 1 tables.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. I. V. Franko (L'vov State University)

SUBMITTED: 17Mar63 DATE ACQ: 17Sep64 ENCL: 00

SUB CODE: IC NO REF SOV: 007 OTHER: 007

Card 3/3

L 14326-65 EWT(m)/EWP(b) ASD(c)-3 JD/JG S/0192/64/005/004/0568/0575
ACCESSION NR: AP4044271

AUTHOR: Glady*shevskiy, Ye. I.

TITLE: Crystal structure of rare earth digermanides

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 4, 1964, 568-575

TOPIC TAGS: rare earth germanide, germanide structure, x ray diffraction, rare earth alloy, germanium alloy, crystal structure, coordination

ABSTRACT: The purpose of this work was to investigate the crystal structure of rare earth digermanides. The alloys of composition corresponding to the formula $RGe_2$ were prepared by fusing rare earth metals with germanium in quartz tubes in argon atmosphere. The obtained alloys were subjected to microstructural and to x-ray diffraction study (powder method) in the cast and in the annealed state at 600C. Compounds $LaGe_2$, $SVdGe_2$, $SmGe_2$ and $GdGe_2$ were found to be isostructural with $GeGe_2$ and $PrGe_2$. The structure of these compounds is $\alpha$-$ThSi_2$ type. $LaGe_2$ and $CeGe_2$ compounds during annealing suffer polymorphic transformations with formation of $\alpha$-$GdSi_2$ type crystalline modification. Due to partially unfilled positions

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of Ge atoms Tb, Dy, Ho, Er, Tm, Yb and Lu form germanides of $R_2Ge_3$ composition with a defect structure of the $AlB_2$ type. All of the structure types are closely related as indicated by the coordination characteristics and interatomic distances. The coordination number of Ge atoms in all four cases is 9. The coordination polyhedrons around the Ge atom are shown in Figure 1, which are nondeformed (in the case of $AlB_2$ structure) and deformed (in the case of other structures) trigonal prisms with atoms opposite the centers of tetragonal faces. The dependence of molecular volume of the compounds considered, determined as the unit cell volume divided by the number of atoms of rare earth element in the unit cell, on the atomic number of rare earth element is shown in Figure 2. The increase of molecular volume for Eu and Yb compounds indicates that in these compounds rare earth atoms are in divalent state but Ce atom atom shows only a little tendency to go over into tetravalent state.

(L'vov State University im. I. V. Franko)

Card 2/5

L 14326-65
ACCESSION NR: AP4044274

SUBMITTED: 24May63 ENCL: 02

SUB CODE: IC, SS NR REF SOV: 005 OTHER: 006

L 14326-65
ACCESSION NR: AP4044274

ENCL: 01

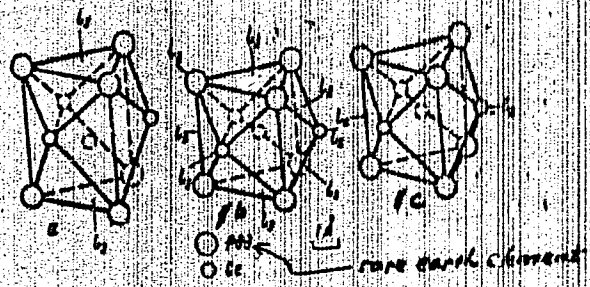



Figure 1
Coordination polyhedrons of germanium atoms in the following structures; a-$EuGe_2$; b-$E_2Ge_3$ and c-$NdGe_2$

Card: 4/5

L 14326-65
ACCESSION NR: AP4044274

ENCL: 02

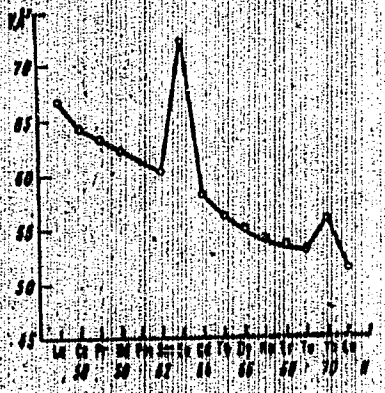


Figure 2
Molecular volume of digermanides of rare earths $RGe_{2-n}$ as a function of the atomic number of R

Card: 5/5

AUTHOR: Gladyshevskiy, Ye. I.; Kripyakevich, P. I.

TITLE: Rare earth metal monosilicides and their crystal structure

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 6, 1964, 853-859

TOPIC TAGS: rare earth metal monosilicide, crystal structure, rare earth metal disilicide, rare earth metal sesquisilicide, CeSi, YSi, molecular volume

ABSTRACT: The existence of the compounds CeSi (FeB type) and YSi (CrB type) was confirmed. The existence of monosilicides of the remaining rare earth metals was established and their crystal structures determined. LaSi, PrSi, NdSi, SmSi, GdSi, TbSi, DySi and HoSi are of the FeB type, and EuSi, ErSi, TuSi, YbSi and LuSi are of the CrB type. In addition, new rare earth metal-silicon compounds were found: $TbSi_2$ ($\alpha$-$GdSi_2$ type); $La_3Si_2$, $Ce_3Si_2$, $Pr_3Si_2$ ($U_3Si_2$ type); and $Gd_5Si_3$, $Tb_5Si_3$, $Dy_5Si_3$, $Ho_5Si_3$, $Er_5Si_3$, $Tu_5Si_3$, $Yb_5Si_3$, $Lu_5Si_3$ ($Mn_5Si_3$ type). X-ray data was tabulated and a graphic comparison of the

Card 1/2

L 25740-65
ACCESSION NR: AP5001707

molecular volumes of these compounds was included. "Purified gadolinium was kindly supplied by I. V. Burov (Institute of Metallurgy)." Orig. art. has: 6 tables and 1 figure

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Iv. Franko (L'vov State University)

SUBMITTED: 10Nov63 ENCL: 00 SUB CODE: IC, GC

NR REF SOV: 009 OTHER: 019

Card 2/2

L 23036-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5001709 S/0192/64/005/006/0919/0921

AUTHOR: Gladyshevskiy, Ye. I.

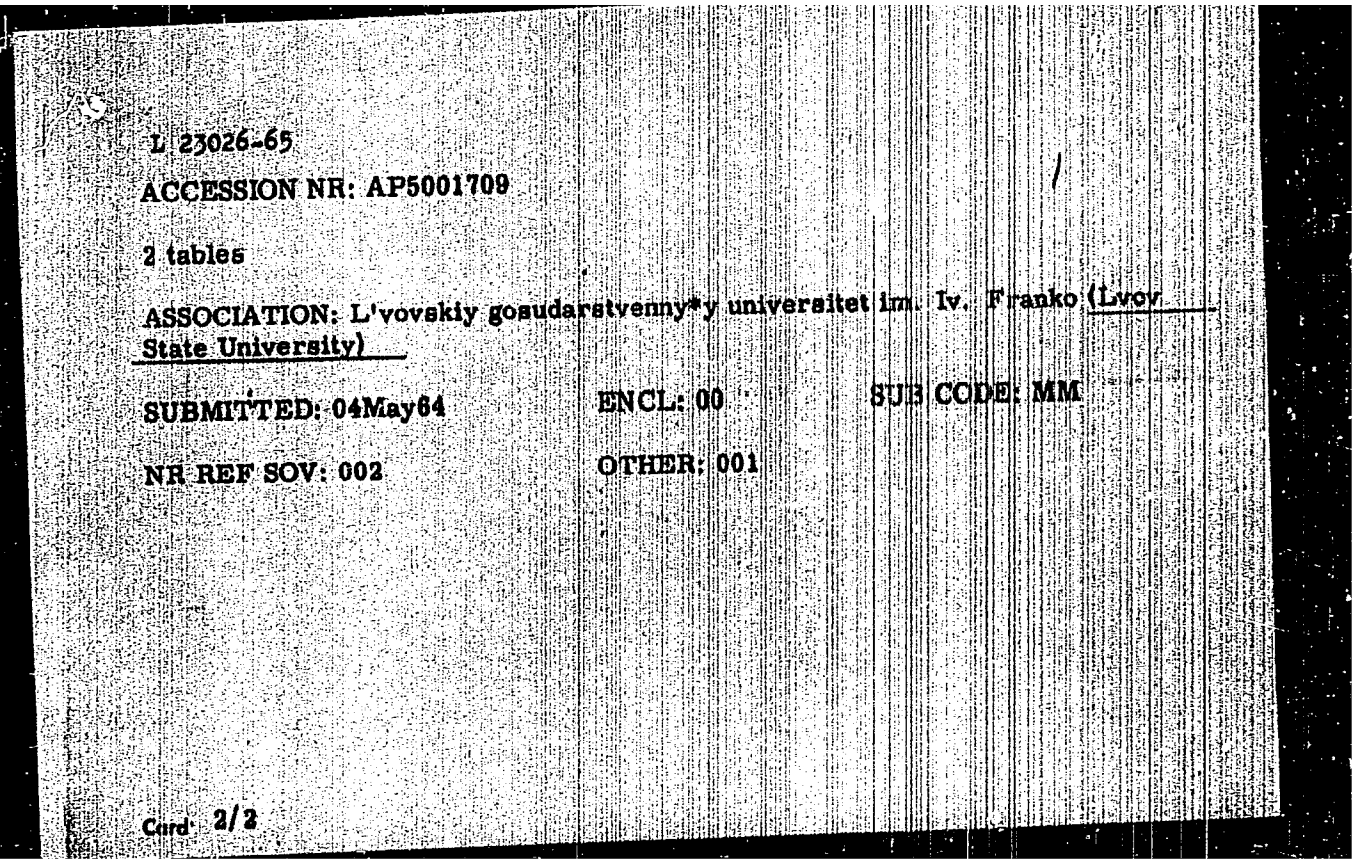
TITLE: Compounds of the $Mn_5Si_3$ type in rare earth metal melts with germanium

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 6, 1964, 919-921

TOPIC TAGS: rare earth germanium alloy, molecular volume, x ray powder pattern, crystal structure

ABSTRACT: A study of the X-ray powder patterns of melts of germanium with each of the rare earth elements except Pm showed that all these elements except Eu and Yb formed $R_5Ge_3$ compounds having the $Mn_5Si_3$ type structure. The lattice spacing and molecular volume of the compounds were tabulated. The molecular volume of the $R_5Ge_3$ compounds decreased regularly in the series of the trivalent atoms: La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, Er, Tu and Lu. Yb formed a compound $Yb_2Ge_3$ (of the $AlB_2$ type); Eu did not form a $Mn_5Si_3$ type compound. Eu-Ge and Yb-Ge melts will be investigated further. Orig. art. has:

Card 1/2



L 23026-65

ACCESSION NR: AP5001709

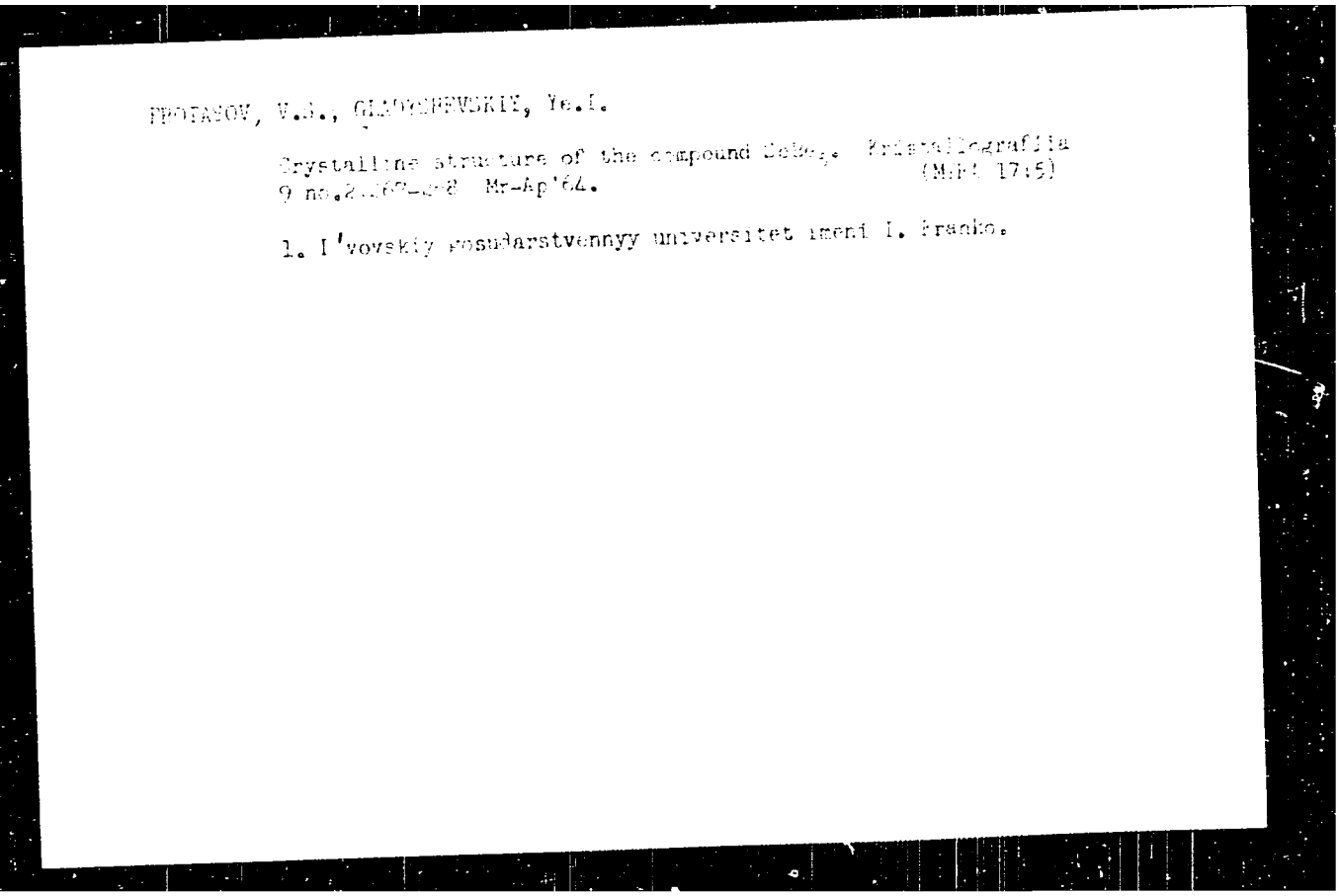
2 tables

ASSOCIATION: L'vovskiy gosudarstvenny*y universitet im. Iv. Franko (Lvov State University)

SUBMITTED: 04May64 ENCL: 00 SUB CODE: MM

NR REF SOV: 002 OTHER: 001

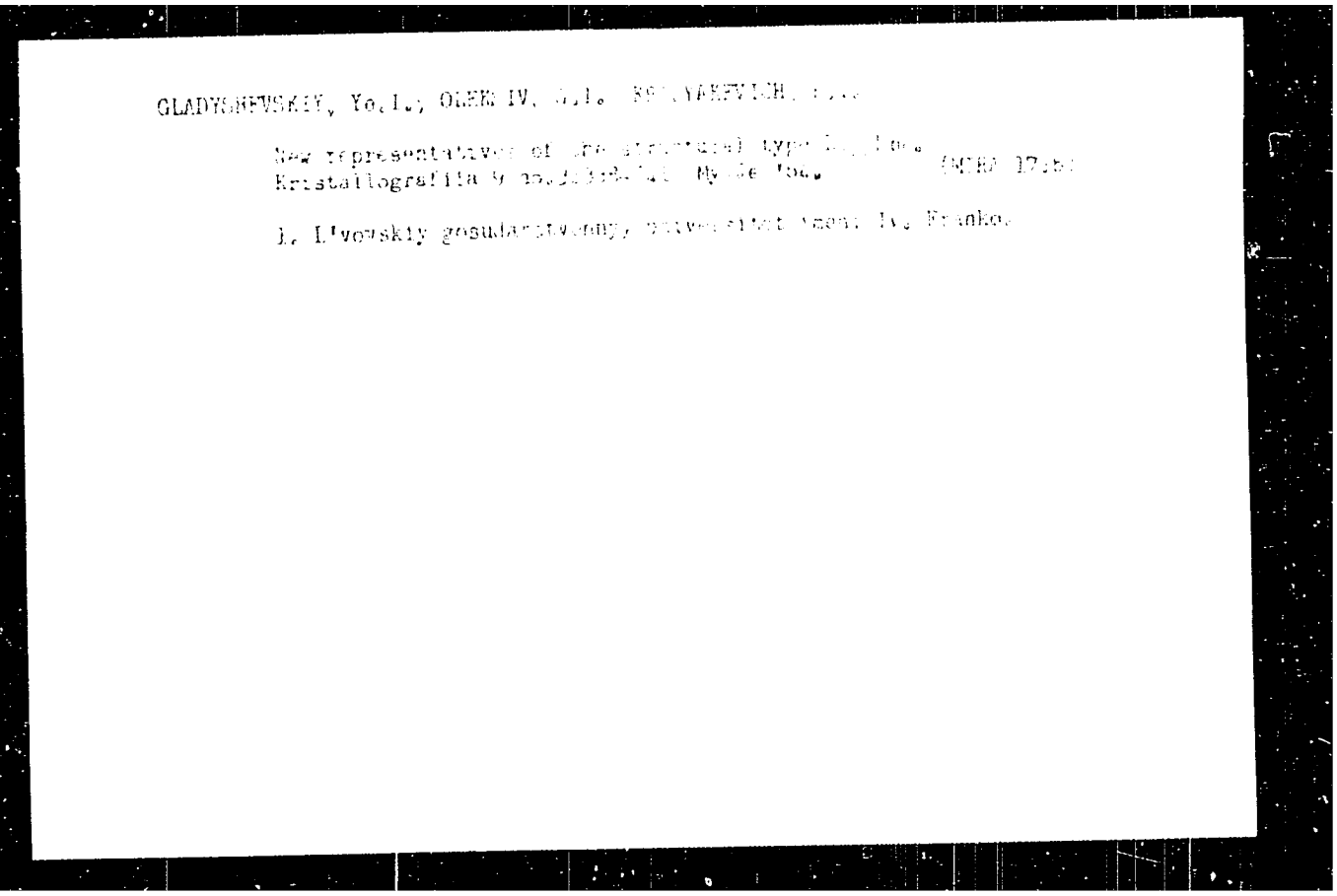
Card 2/2



PROTASOV, V.S., GLADYSHEVSKIY, Ye.I.

Crystalline structure of the compound $Dy_2Ge_2$. Kristallografiia 9 no.2:267-268 Mr-Ap'64. (MIRA 17:5)

1. L'vovskiy gosudarstvennyy universitet imeni I. Franko.



GLADYSHEVSKIY, Ye.I.; OLEKH IV, S.I. [illegible]

New representatives of [illegible] (NCRA 17:5)
Kristallografiia 9 no.1:[illegible] My-Je '64.

1. L'vovskiy gosudarstvennyy universitet imeni Ivana Franko.

ACCESSION NR: AP4039400 S/0070/64/009/003/0410/0411

AUTHORS: Kripyakevich, P. I.; Yevdokimenko, V. I.; Glady*shevskiy, Ye. I.

TITLE: Compounds with a superlattice such as Alpha manganese in systems of rare earth metals and magnesium

SOURCE: Kristallografiya, v. 9, no. 3, 1964, 410-411

TOPIC TAGS: superlattice, alpha manganese, rare earth, magnesium, x ray study

ABSTRACT: The authors have prepared alloys of Tb, Ho, Tu, Yb, and Lu containing 82.8 atomic % of Mg in the charge (i.e., corresponding to a composition of $R_5Mg_{24}$), by alloying Tb (99.15%, 0.5% other rare earths), Ho (97.4%, 2.1% other), Tu (94.7%, 5.1% other), Yb (99.96%, 0.005% other), and Lu (95.7%, 3.8% other) with Mg (99.9%) in crucibles of MgO with a flux (LiCl + KCl) in a Tamman furnace (atmosphere of He or A). The alloys are silvery white, and they oxidize in air, but much more slowly than alloys of Mg with rare earths of the Ce group. X-ray studies show that Tu and Lu alloys contain pure compounds of the $Ti_5Re_{24}$ type, but that Tb and Ho alloys contain this type of compound in equilibrium with other compounds, particularly $TbMg_3$ and $HoMg_2$. Experimental intensities for $Tu_5Mg_{24}$ (visual observation) are in

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ACCESSION NR: AP4039400

good agreement with computed values. X-ray patterns for other compounds of the type $R_5Mg_{24}$ are almost indistinguishable from those for $Tu_5Mg_{24}$ relative to experimental intensities. The lattice constant a for different compounds with the formula $R_5Mg_{24}$: in Å, are: 11.283, 11.246, 11.233, 11.224, 11.208, 11.185, and 11.257 for Tb, Dy, Ho, Er, Tu, Lu, and Y, respectively. The value may be seen to decrease with increase in atomic number (except for Y, which is between Tb and Dy). Orig. art. has: 2 tables.

ASSOCIATION: L'vovskiy gosudarstvenny*y universitet im. I. Franko (Lvov State University)

SUBMITTED: 01Aug63 ENCL: 00

SUB CODE: SS, OP NO REF SOV: 006 OTHER: 001

Card 2/2

ACCESSION NR: AP4019490 S/0078/64/009/003/0665/0670

AUTHORS: Gladyshevskiy, Ye. I.; Kuz'ma, Yu.B.; Kovalik, D.A.

TITLE: Phase equilibria and crystal structure of the compounds in the Re-Fe(Co, Ni)-Si systems

SOURCE: Zhurnal neorg. khimii, v. 9, no. 3, 1964,665-670

TOPIC TAGS: rhenium iron silicon system, rhenium cobalt silicon system, rhenium nickel silicon system, phase equilibrium, crystal structure, ternary intermetallic compound, x ray analysis, microstructure, $Re_3Fe_2$, $W_6Fe_7$, gamma phase, $\mu$ phase, $Re_6Fe_6Si$, $Re_6Co_{5.7}Si_{1.3}$

ABSTRACT: Preliminary phase analyses of the alloys of the ternary systems Re-Fe-Si, Re-Co-Si and Re-Ni-Si were undertaken to verify that Fe, Co and Ni form ternary intermetallic compounds in ternary systems with Re and Si. The phase equilibria at 800C were studied in these systems; isothermal sections were constructed from x-ray and microstructure data (figs. 1, 2 and 3). A new intermetallic compound of the beta-manganese structure type (gamma' phase a = 6.43 ± 0.01A) is formed in the Re-Fe system near $Re_3Fe_2$. The existence of ternary

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ACCESSION NR: AP4019490

Intermediate compounds of the $W_6Fe_7$ type structure ($\mu$-phase) was established in Re-Fe-Si and Re-Co-Si. $Re_6Fe_6Si$ (a = 4.67 ± 0.01A; c = 25.69 ± 0.05A; c/a = 5.50) exists in equilibrium with $Fe_3Si$, FeSi and $Re_5Si_3$. $Re_6Co_{5.7}Si_{1.3}$ (a = 4.633 ± 0.002A; c = 25.514 ± 0.005A; c/a = 5.507) is in equilibrium with $Co_2Si$, CoSi and $Re_5Si_3$. Compounds of the $W_6Fe_7$ type structure are absent in the Re-Ni-Si system. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: L'vovskiy ordena Lenina gosudarstvennyy universitet im. I. Franko (Lvov State University)

SUBMITTED: 08Jan63 DATE ACQ: 31Mar64 ENCL: 03

SUB CODE: CH, ML NR REF SOV: 013 OTHER: 007

Card 2/5

ACC NR: AP4019490

ENCL: 01

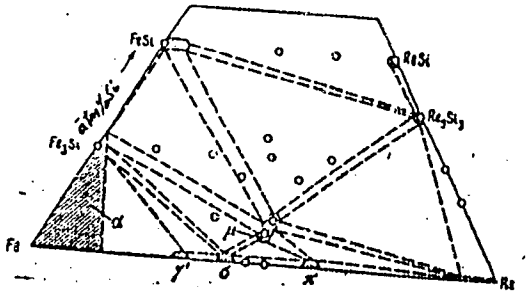


Figure 1

Isothermal section of part of the ternary system Re-Fe-Si at 8000

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ACC NR: AP4019490

ENCL: 02

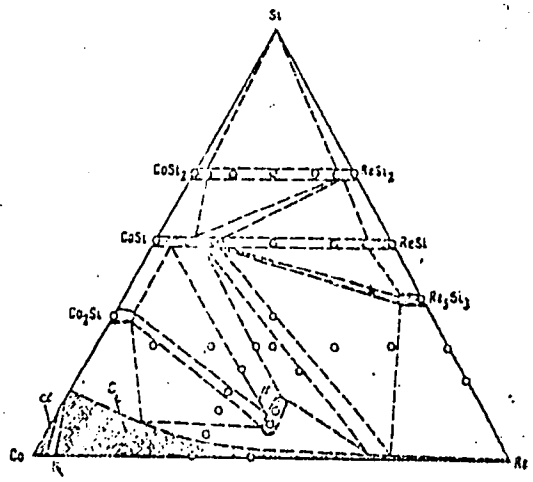


Figure 2

Isothermal section of the Re-Co-Si system at 800C

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ACC NR: AP4019490 ENCL: 03

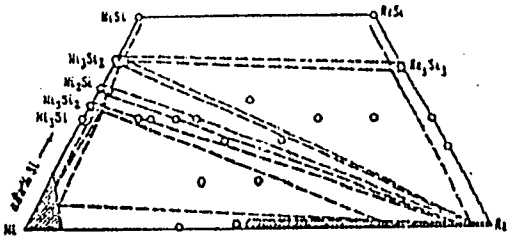

Figure 3
Isothermal section of part of the ternary system Re-Ni-Si at 8000

Card: 5/5

ACCESSION NR: AP4019492 S/0078/64/009/003/0674/0681

AUTHORS: Kuz'ma, Yu. B.; Glady*shevskiy, Ye. I.

TITLE: The Mn-Co-Si system

SOURCE: Zhurnal neorg. khimii, v. 9, no. 3, 1964, 674-681

TOPIC TAGS: manganese cobalt silicon system, manganese silicon system, cobalt silicon system, manganese cobalt system, Mn sub 3 Si, Mn sub 5 Si sub 3, MnSi, Mn sub 3 Si sub 5, Mn sub 6 Si, alpha beta manganese transition, MnCo sub 3, Co sub 2 Si, Co sub 3 Si, solid solution, ternary compound, MnCoSi, Mn sub 2 CoSi, Mn sub 3 Co sub 3 Si, MnCo sub 2 Si, crystal structure

ABSTRACT: The object of the work was to determine the phase equilibria in the Mn-Co-Si ternary system and in the Mn-Si, Mn-Co, and Co-Si binary systems. The 800C isothermal cross section of the system was constructed from x-ray and microstructure data for 185 melts (fig. 1). The following compounds exist in the Mn-Si system: $Mn_3Si$, $Mn_5Si_3$, MnSi, $Mn_3Si_5$, a compound containing 18 at.% Si (phase N), and $Mn_6Si$ which is identical with a compound previously identified

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ACCESSION NR: AP4019492

as having 14 at.% Si. Silicon lowers the transition temperature from alpha- to beta-manganese. In Mn-Co melts annealed from 400C, there are two intermediate compounds approximating $MnCo_3$ in composition. The Co-Si system has two phases consisting of $Co_2Si$ and a solid solution based on Co; $Co_3Si$ does not exist. In the ternary system the boundaries of the solid solutions were established based on components and double compounds. Seven ternary intermediate compounds were found and their areas of homogeneity determined; (MnCoSi), R', U, $\lambda_1$ ($MnCo_{1.34-1.25}Si_{0.66-0.75}$), S ($Mn_2CoSi$), X ($Mn_3Co_2Si$) and H($MnCo_2Si$). The crystal structure of $Mn_4Si$ and the R'-phase were found to be of the same structure type as the R-phase (space group $C_{3i}^2$ -$R\bar{3}$). For $Mn_6Si$ a = 10.874 ± 0.005A, c = 19.177 ± 0.010A, c/a = 1.764; for the R' phase a = 10.755 ± 0.005A, c = 19.126 ± 0.010A, c/a = 1.778. Orig. art. has: 5 tables and 3 figures.

ASSOCIATION: L'vovskiy ordena Lenina gosudarstvenny*y universitet im. I. Franko (L'vov State University)

SUBMITTED: 21Feb63 DATE ACQ: 31Mar64 ENCL: 01

SUB CODE: CH NR REF SOV: 014 OTHER: 013

Card 2/3

ACCESSION NR: AP4019492

ENCLOSURE: 01

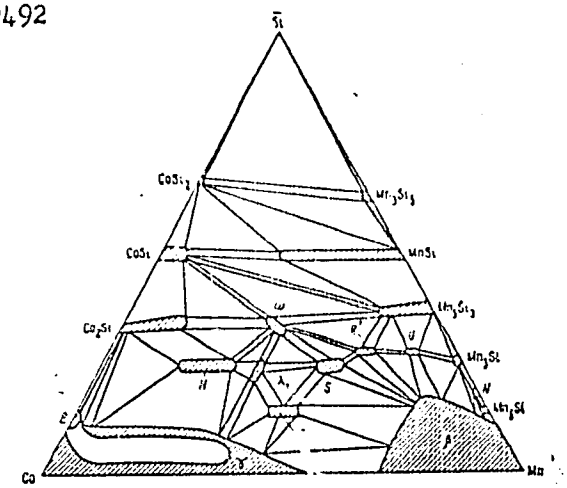


Figure 1

Isothermal section of the Mn-Co-Si system at 800C.

Card 3/3

ACCESSION NR: AP4036968 S/0078/64/009/005/1169/1173

AUTHORS: Glady*shevskiy, Ye. I.; Fedorov, T.F.; Gorshkova, L.V.

TITLE: The zirconium-tantalum-carbon system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 5, 1964, 1169-1173

TOPIC TAGS: zirconium tantalum carbon system, x ray analysis, zirconium tantalum carbon alloy, fusion temperature, hardness, chemical inertness, superconductor, phase diagram, ternary compound, heat treatment, zirconium tantalum system, tantalum carbon system, zirconium carbon system

ABSTRACT: The structure of ternary Zr-Ta-C alloys quenched from 1450C was studied by metallographic and x-ray diffraction analysis. The alloys of this system are characterized by being high melting (about 40000), hard (3000 kg/mm$^2$), inert to chemical reagents, and superconductive at low temperatures. Previously known data on the Zr-Ta, Ta-C, and Zr-C binary systems are reviewed. A phase diagram was constructed for the Zr-Ta-C ternary system (see Fig. 1 of the enclosure). In this investigation, no ternary compounds were found, but presence of four single-phase, six two-phase, and two three-phase

Card 1/3

ACCESSION NR: AP4036968

regions was established. It was revealed by microscopic study of the alloys that they had not reached an equilibrium under the heat treatment to which they had been subjected (i.e. annealing at temperatures ranging from 1450 to 2300C for 6 to 70 hours). Orig. art. has: 3 tables and 4 figures.

ASSOCIATION: None

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| SUBMITTED: 12Apr63 | ATD PRESS: 3077 | ENCL: 01 |
| SUB CODE: MM | NO REF SOV: 009 | OTHER: 006 |

Card 2/3

ACCESSION NR: AP4036968

ENCLOSURE: 01

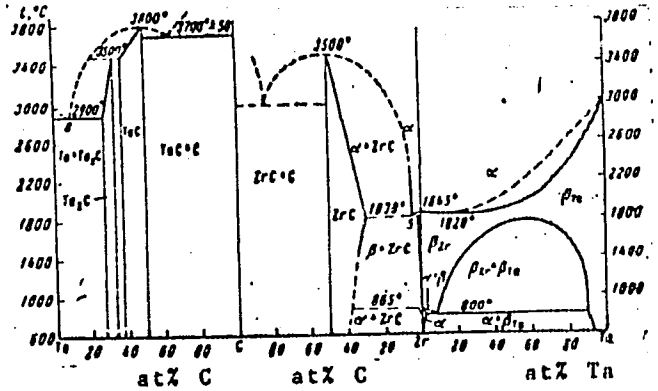



Fig. 1. Phase equilibria in the Zr-Ta-C system at 1450C.

3/3

Card

GLADYSHEVSKIY, Ye.I.; FEDOROV, T.F.; GORSHKOVA, L.V.

System zirconium - tantalum - carbon. Zhur. neorg. khim. 9 no.5:1169-1173 My '64. (MIRA 17:9)

L 16584-65 EWT(m)/EPR/EWP(t)/EWP(b) Ps-4 IJP(c)/ESD(gs)/ASD(a)-5/ASD(m)-3/
AS(mp)-2 JD
ACCESSION NR: AP5000286 S/0070/64/009/006/0835/0838

AUTHORS: Zarechnyuk, O. S.; Kripyakevich, P. I.; Gladyshevskiy, Ye. I.

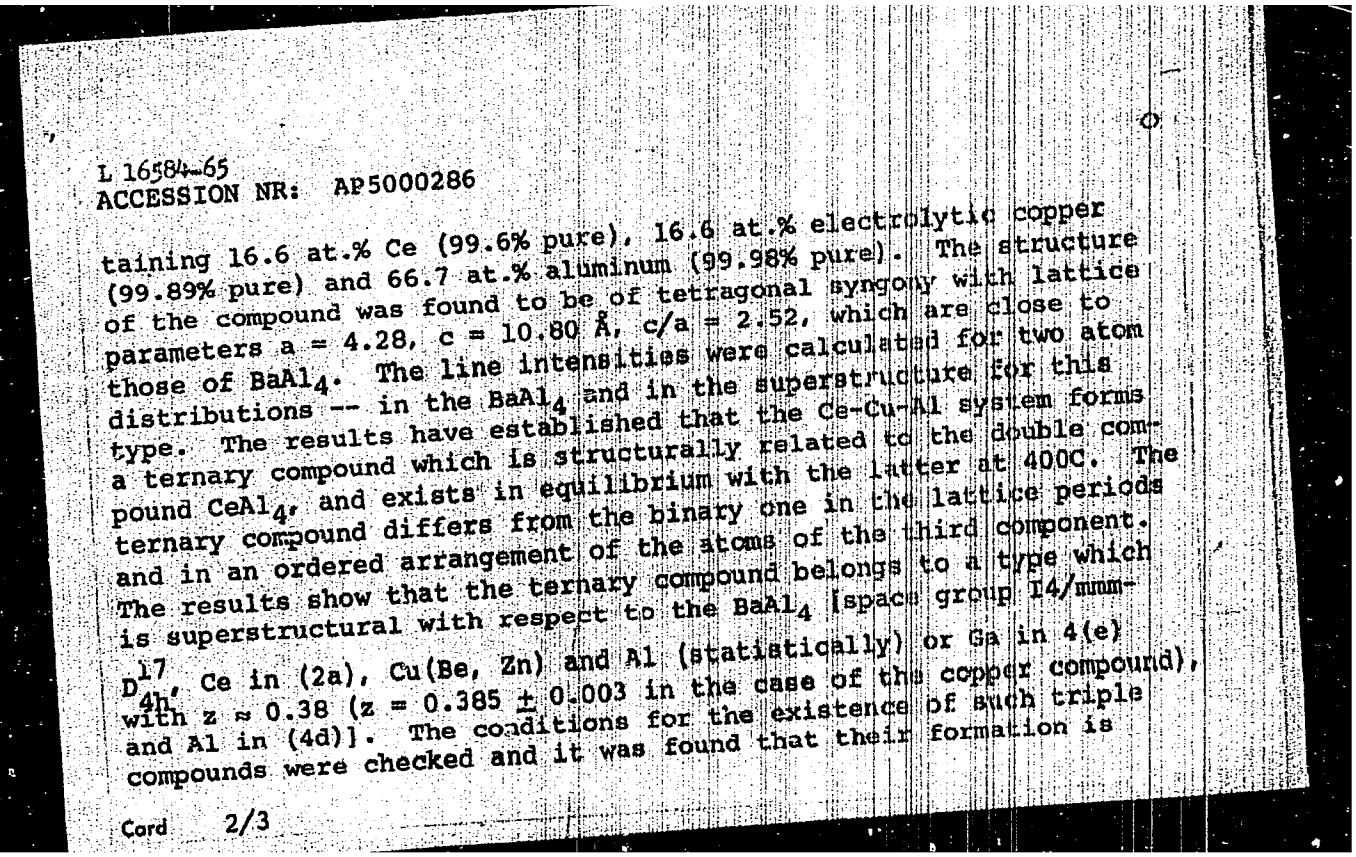
TITLE: Ternary intermetallic compounds with superstructure relative to the $BaAl_4$ type

SOURCE: Kristallografiya, v. 9, no. 6, 1964, 835-838

TOPIC TAGS: intermetallic compound, x ray structure analysis, crystal syngony, crystal lattice parameter, cerium compound

ABSTRACT: In order to determine the type of crystal structure of the compounds $CeCu_{0.75 \rightarrow 1.0}Al_{3.25 \rightarrow 3.0}$, $CeBe_{1.2 \rightarrow 1.4}Al_{2.8 \rightarrow 2.6}$ and $Ce(Zn, Al)_4$, the authors made an x-ray structural investigation of a single crystal compound of the Ce-Cu-Al system. The single crystal (0.2--0.3 mm) was obtained by slow cooling of a melt con-

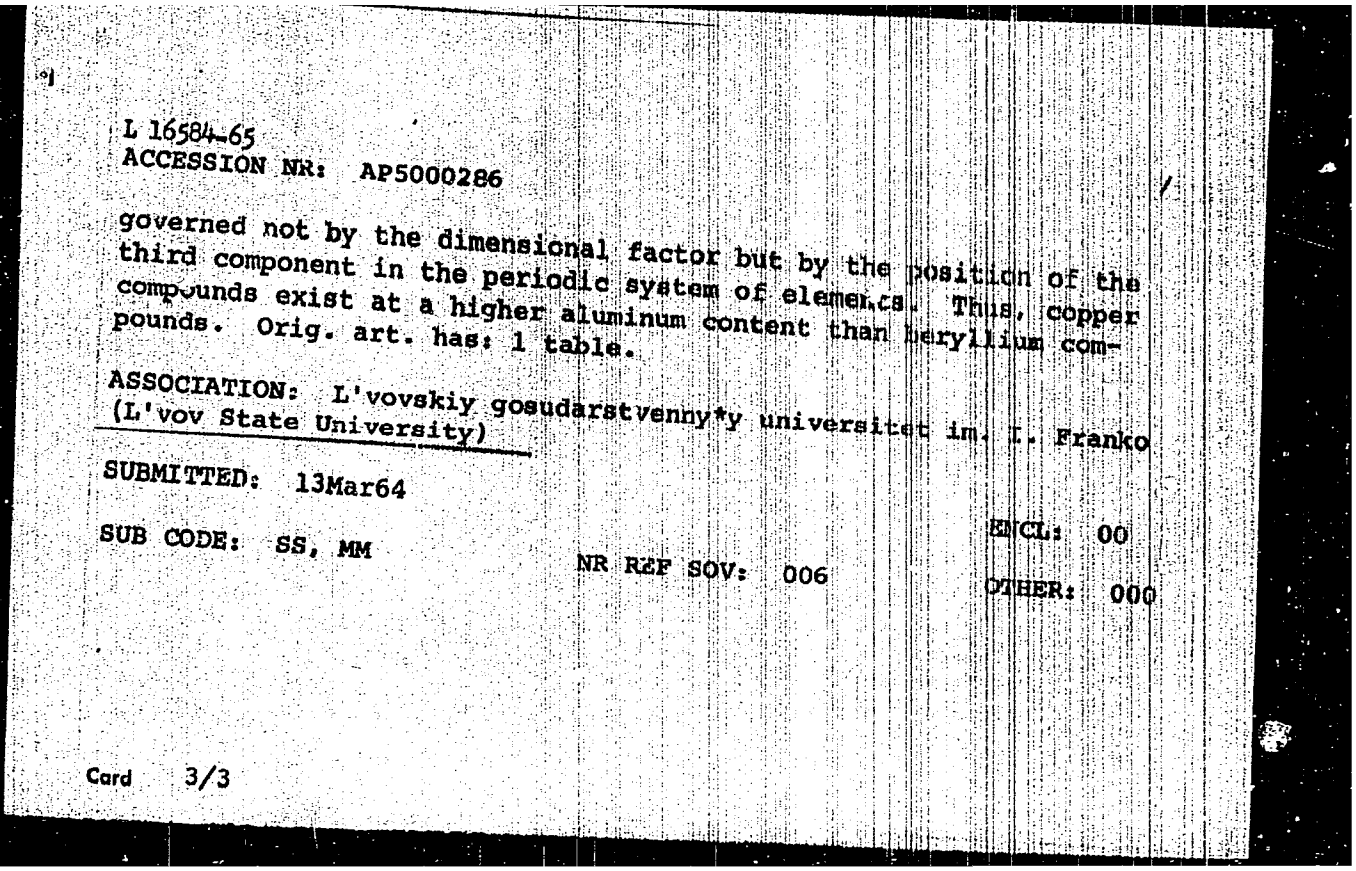
Card 1/3



L 16584-65
ACCESSION NR: AP5000286

taining 16.6 at.% Ce (99.6% pure), 16.6 at.% electrolytic copper (99.89% pure) and 66.7 at.% aluminum (99.98% pure). The structure of the compound was found to be of tetragonal syngony with lattice parameters a = 4.28, c = 10.80 Å, c/a = 2.52, which are close to those of $BaAl_4$. The line intensities were calculated for two atom distributions -- in the $BaAl_4$ and in the superstructure for this type. The results have established that the Ce-Cu-Al system forms a ternary compound which is structurally related to the double compound $CeAl_4$, and exists in equilibrium with the latter at 400C. The ternary compound differs from the binary one in the lattice periods and in an ordered arrangement of the atoms of the third component. The results show that the ternary compound belongs to a type which is superstructural with respect to the $BaAl_4$ [space group $I4/mmm-D_{4h}^{17}$, Ce in (2a), Cu(Be, Zn) and Al (statistically) or Ga in 4(e) with z ≈ 0.38 (z = 0.385 ± 0.003 in the case of the copper compound), and Al in (4d)]. The conditions for the existence of such triple compounds were checked and it was found that their formation is

Card 2/3



L 16584-65
ACCESSION NR: AP5000286

governed not by the dimensional factor but by the position of the third component in the periodic system of elements. Thus, copper compounds exist at a higher aluminum content than beryllium compounds. Orig. art. has: 1 table.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. I. Franko (L'vov State University)

SUBMITTED: 13Mar64

SUB CODE: SS, MM NR REF SOV: 006 ENCL: 00 OTHER: 000

Card 3/3

ACCESSION NR: AP4041585 S/0078/64/009/007/1653/1657

AUTHOR: Baron, V. V.; Yefimov, Yu. V.; Savitskiy, Ye. M.; Glady*shevskiy, Ye. I.

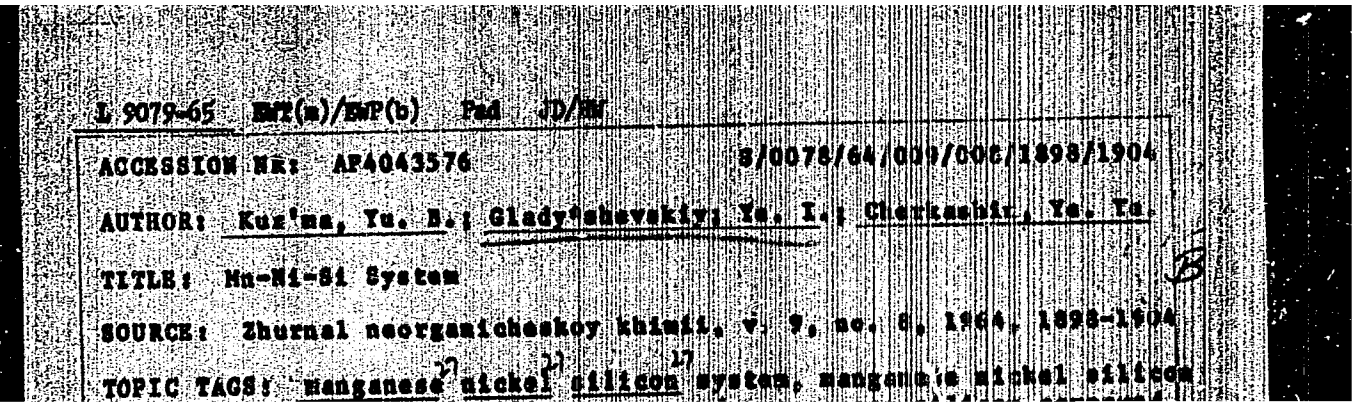
TITLE: Vanadium-niobium-silicon system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 7, 1964, 1653-1657

TOPIC TAGS: vanadium niobium silicon system, vanadium niobium silicon alloy, alloy phase composition, alloy structure

ABSTRACT: Phase equilibrium in alloys of the V-Nb-Si system containing up to 50% Si has been studied. Alloys were melted from 99.9% pure sintered Nb, 99.8% pure Si, and 99.4 or 99.9% pure V in an arc furnace with nonconsumable tungsten electrodes in purified helium under a pressure of 0.7 atm. Alloy ingots weighing 20—50 g were rapidly cooled immediately after solidification; half were then annealed at 800C for 2500 hr and quenched. X-ray diffraction and microstructural analysis and microhardness tests were used in the investigation. On the basis of the results, the equilibrium diagram of the V-Nb-Si system was plotted. The $V_5Si_3$ and the β-modification of $Nb_5Si_3$

Card 1/2



L 9079-65 EWT(m)/EWP(b) Pad JD/HW

ACCESSION NR: AP4043576 S/0078/64/009/008/1898/1904

AUTHOR: Kuz'ma, Yu. B.; Gladyshevskiy, Ye. I.; Cherkashin, Ye. Ye.

TITLE: Mn-Ni-Si System

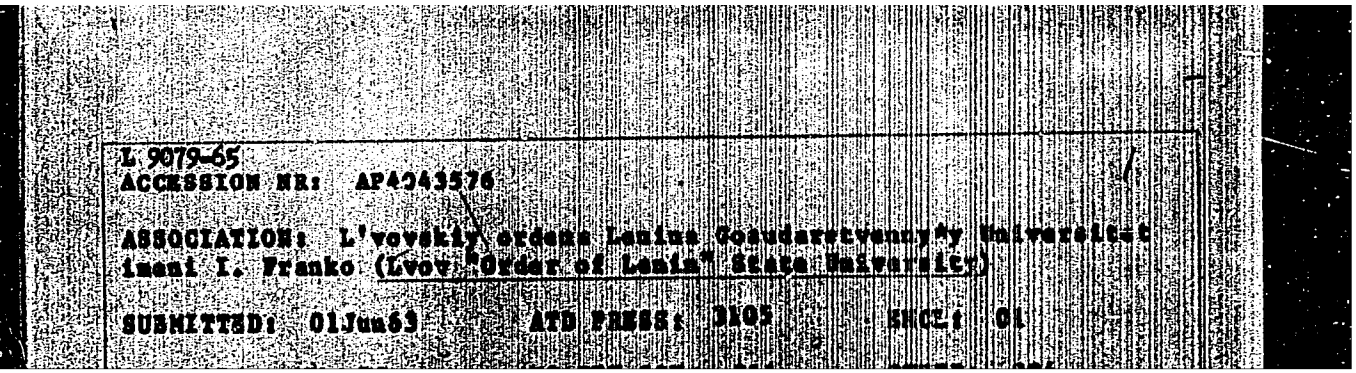
SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1898-1904

TOPIC TAGS: manganese[27] nickel[27] silicon[17] system, manganese nickel silicon

nickel silicon compound

ABSTRACT: The authors studied 240 manganese-nickel-silicon alloys, mostly those rich in manganese and nickel. On the basis of the results, the isothermal (for 800C) section of the ternary diagram was plotted (see Fig. 1 of the Enclosure). At 800C ten ternary compounds exist in the system, all of them with a small region of homogeneity. No ternary compounds were found in alloys containing over 50 at% silicon. Orig. art. has: 4 figures and 3 tables.

Card 1/3



L 9079-65
ACCESSION NR: AP4043576

ASSOCIATION: L'vovskiy ordena Lenina Gosudarstvennyy universitet imeni I. Franko (Lvov "Order of Lenin" State University)

SUBMITTED: 01Jun63 ATD PRESS: 3105 ENCL: 01

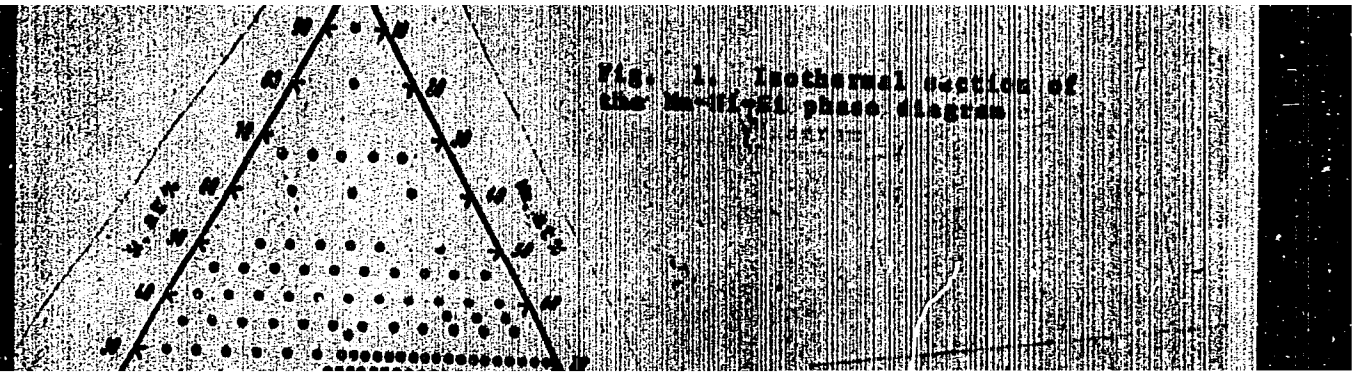
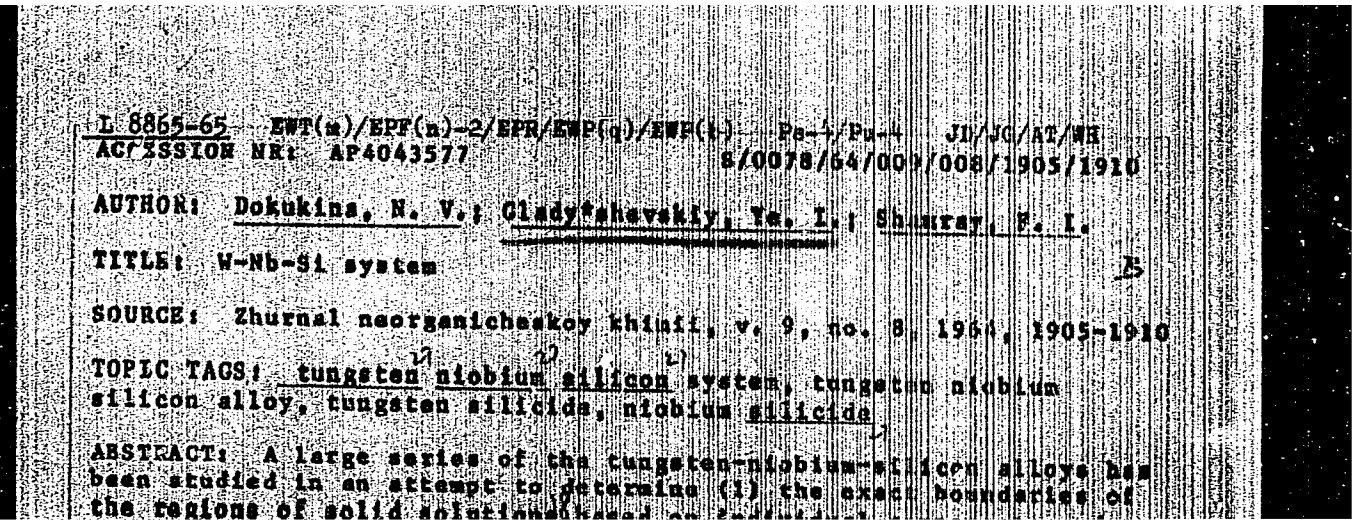


Fig. 1. Isothermal section of the ternary phase diagram



L 8865-65 EWT(m)/EPF(n)-2/EPR/EWP(q)/EWP(t) Pe-5/Pu-4 JD/JG/AT/WH
ACCESSION NR: AP4043577 S/0078/64/009/008/1905/1910

AUTHOR: Dokukina, N. V.; Gladyshevskiy, Ye. I.; Shmurat, V. I.

TITLE: W-Nb-Si system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1905-1910

TOPIC TAGS: tungsten niobium silicon system, tungsten niobium silicon alloy, tungsten silicide, niobium silicide

ABSTRACT: A large series of the tungsten-niobium-silicon alloys has been studied in an attempt to determine (1) the exact boundaries of the regions of solid solutions based on [illegible]

to transformation of β-$Nb_5Si_3$ to α-$Nb_5Si_3$, which dissolves only 8 molz $W_5Si_3$. The solubility of $Nb_5Si_3$ in $W_5Si_3$ [illegible] 80 molz. No ternary compounds were found in the system, and no $Nb_4B_3$ compound was found in any of the ternary alloys. Orig. art. has: 8 figures.

ASSOCIATION: Institut metallurgii im A. A. Baykova (Institute of Metallurgy): L'vovskiy [illegible]

GLADISHEVSKIY, YE. I

L 8772-65 EWT(m)/EWP(b) ASD(a)-5/AS(mp)-2/AFWL/SSD/ESD(t)/RAEM(t) JD/JG
ACCESSION NR: AP4043590 S/0078/64/009/008/2045/2046

AUTHOR: Savitskiy, Ye. M.; Baron, V. V.; Yefimov, Yu. V.; Knyazik, V. N.; Vyatlezhanina, T. V.; Gladyshevskiy, Ye. I.

TITLE: The $V_3Si$-$V_3Ge$ system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 2045-2046, and insert facing p. 2035

TOPIC TAGS: superconductivity, superconductive alloy, vanadium alloy, silicon alloy, germanium alloy, superconductive vanadium silicon compound, superconductive vanadium germanium compound, vanadium silicide, vanadium germanide

ABSTRACT: A series of $V_3Si$-$V_3Ge$ alloys containing up to 25 at% vanadium were melted from 99.8% vanadium, 99.8% silicon, and 99.9% germanium in a nonconsumable electrode arc furnace in helium under pressure of 0.7 atm and annealed at 800C for 2500 hr. Microscopic examination and x-ray diffraction patterns revealed that the components form a continuous series of solid solutions. $T_k$, the transition temperature to the superconductive state (all the alloys of the system are super-

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L 8772-65

ACCESSION NR: AP4043590

conductors), was found to decrease continously from 17.1K for $V_3Si$ to 6.01K for $V_3Ge$ as shown in Fig. 1 of the Enclosure. Fig. 1 also shows the composition dependence of the microhardness and lattice constant of the solid solution and the transition curves for four alloys tested. Orig. art. has: 2 figures.

ASSOCIATION: none

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| SUBMITTED: 28Feb64 | ATD PRESS: 3108 | ENCL: 01 | |
| SUB CODE: MM, SP | NO REF SOV: 004 | OTHER: 004 | |

Card 2/3

L 8772-65
ACCESSION NR: AP4043590

ENCLOSURE: 01

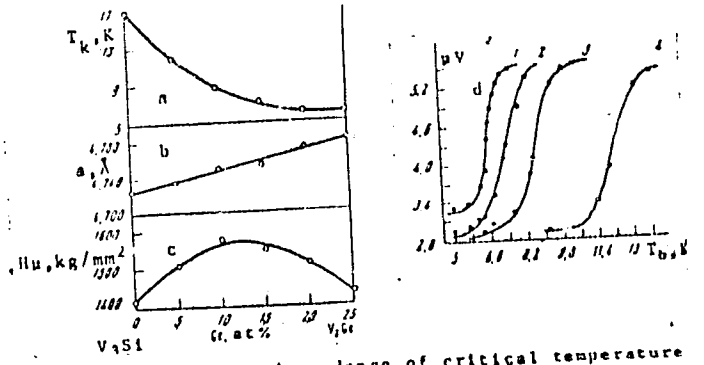


Fig. 1. Composition dependence of critical temperature a, lattice constant b, and microhardness c of $V_3Si$—$V_3Ge$ alloys and transition curves d of the alloys tested.

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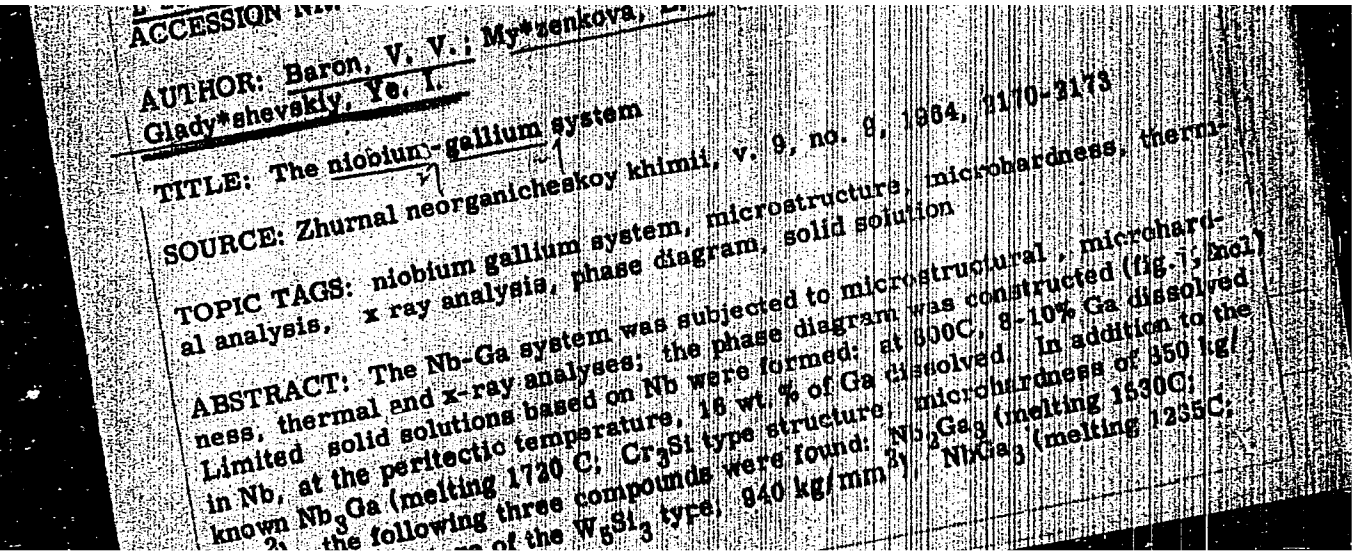
1 - $V_3(Si_{0.2}, Ge_{0.8})$; 2 - $V_3(Si_{0.4}, Ge_{0.6})$; 3 - $V_3(Si_{0.6}, Ge_{0.4})$; 4 - $V_3(Si_{0.8}, Ge_{0.2})$.



ACCESSION NR:

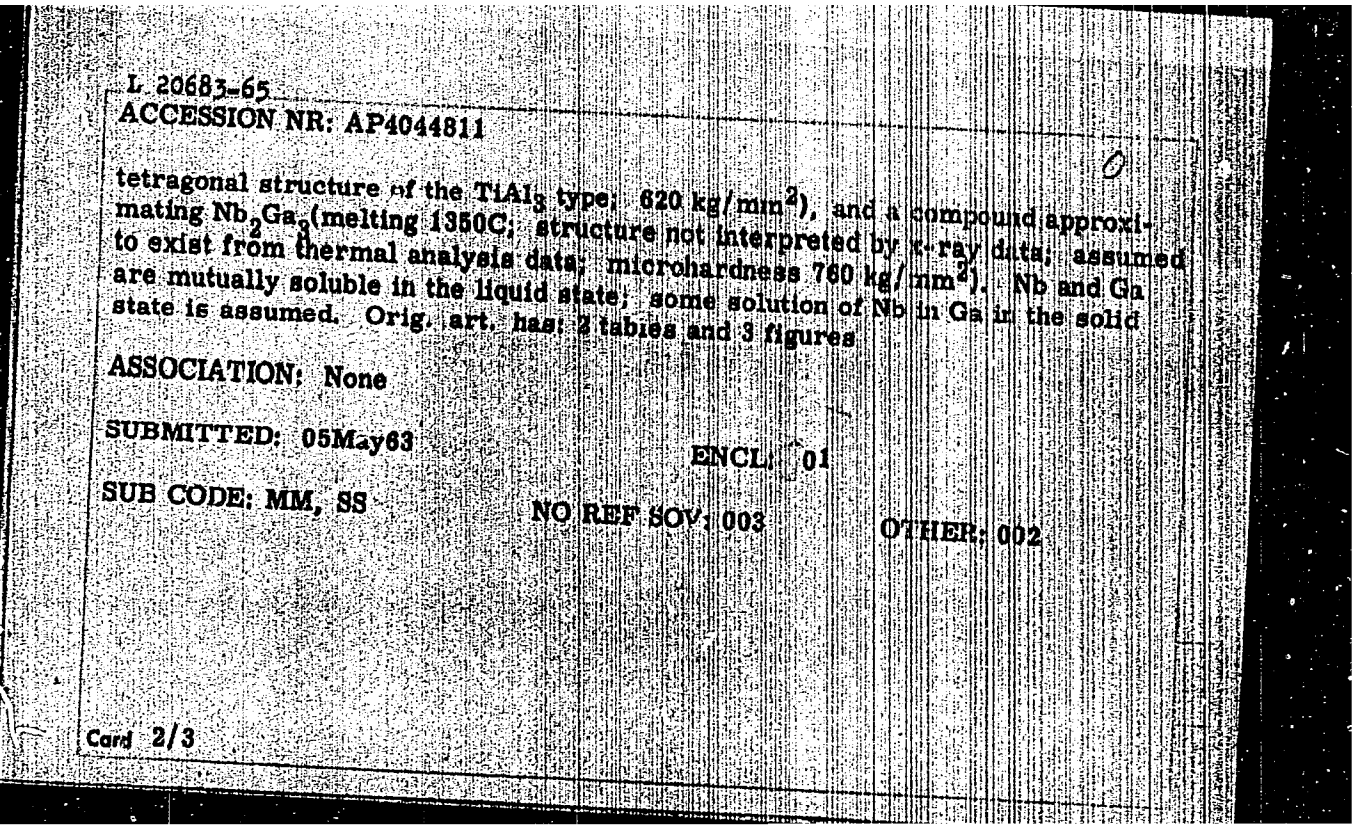
AUTHOR: Baron, V. V.; My*zenkova, E.; Glady*shevskiy, Ye. I.

TITLE: The niobium-gallium system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 9, 1964, 2170-2173

TOPIC TAGS: niobium gallium system, microstructure, microhardness, thermal analysis, x ray analysis, phase diagram, solid solution

ABSTRACT: The Nb-Ga system was subjected to microstructural, microhardness, thermal and x-ray analyses; the phase diagram was constructed (fig. 1, incl.). Limited solid solutions based on Nb were formed: at 800C, 8-10% Ga dissolved in Nb, at the peritectic temperature, 16 wt. % of Ga dissolved. In addition to the known $Nb_3Ga$ (melting 1720 C; $Cr_3Si$ type structure, microhardness of 950 kg/mm$^2$), the following three compounds were found: $Nb_2Ga_3$ (melting 1530C; 2) the $W_6Si_3$ type, 940 kg/mm$^2$), $NbGa_3$ (melting 1255C;



L 20683-65
ACCESSION NR: AP4044811

tetragonal structure of the $TiAl_3$ type; 620 $kg/mm^2$), and a compound approximating $Nb_2Ga_3$ (melting 1350C; structure not interpreted by x-ray data; assumed to exist from thermal analysis data; microhardness 760 $kg/mm^2$). Nb and Ga are mutually soluble in the liquid state; some solution of Nb in Ga in the solid state is assumed. Orig. art. has: 2 tables and 3 figures

ASSOCIATION: None

SUBMITTED: 05May63 ENCL: 01

SUB CODE: MM, SS NO REF SOV: 003 OTHER: 002

Card 2/3

L 20683-65
ACCESSION NR: AP4044811

ENCLOSURE: 01

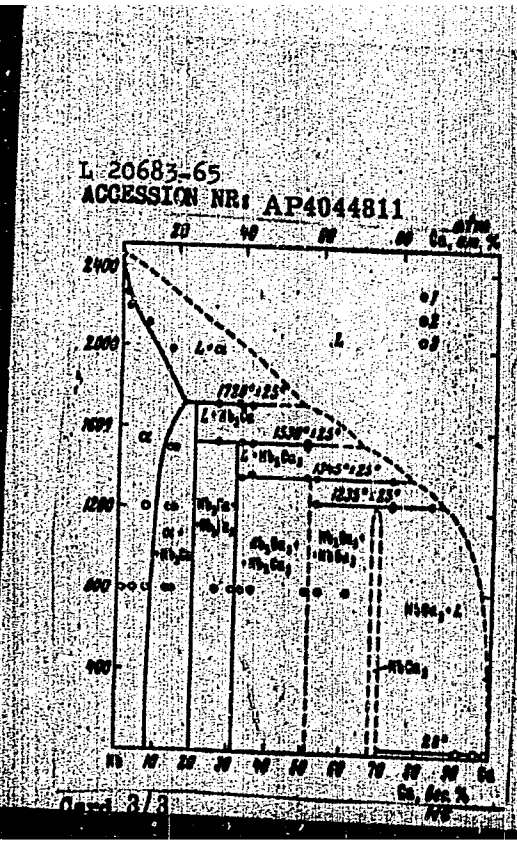


Fig. 1

Phase diagram of the niobium-gallium system

1--thermal analysis data; 2--two-phase melts; 3--single phase melt

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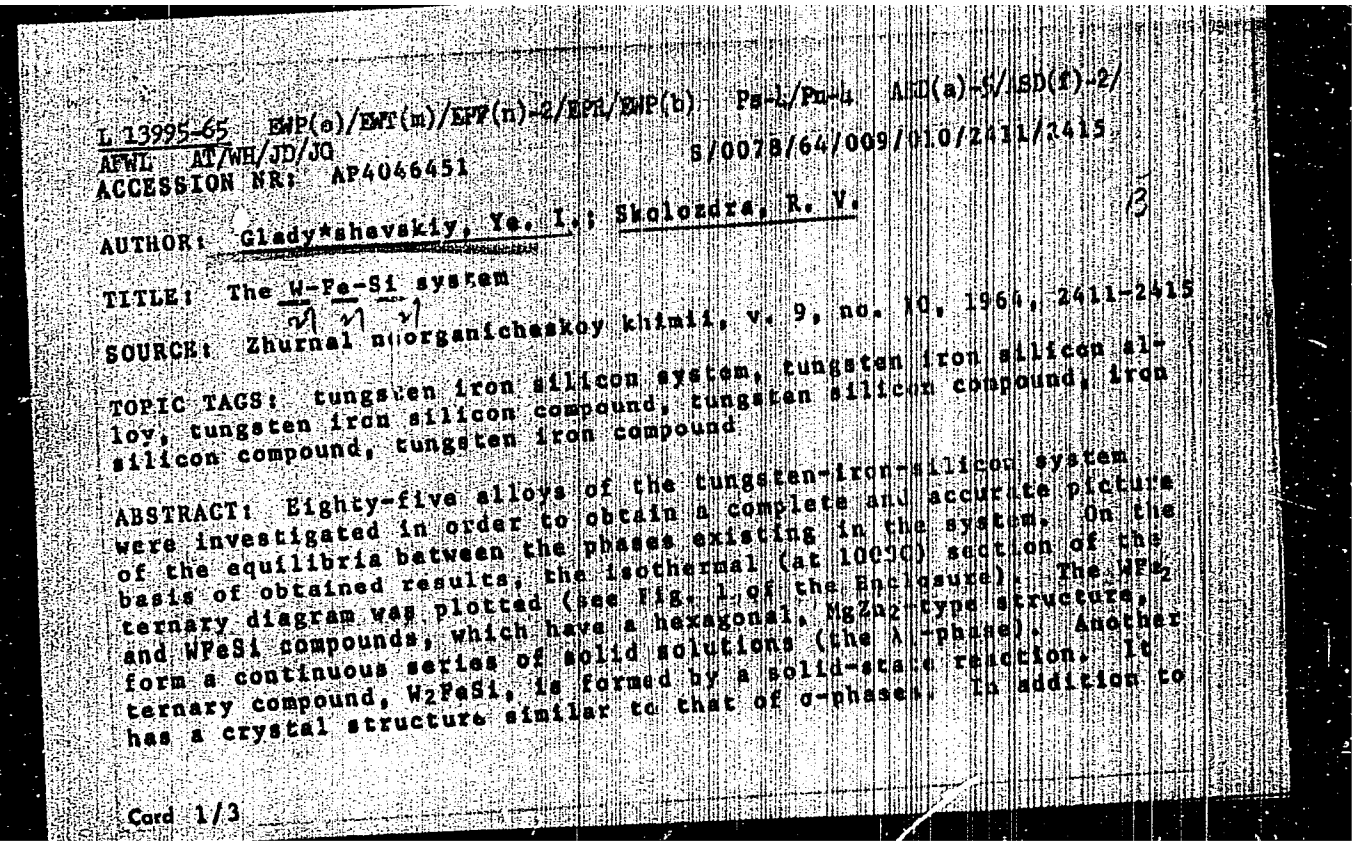

L 13995-65 EWP(e)/EWT(m)/EPF(n)-2/EPR/EWP(b) Pe-L/Pu-4 ASD(a)-5/ASD(f)-2/
AFWL AT/WH/JD/JG S/0078/64/009/010/2411/2415
ACCESSION NR: AP4046451

AUTHOR: Gladyshevskiy, Ye. I.; Skolozdra, R. V. 13

TITLE: The W-Fe-Si system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 10, 1964, 2411-2415

TOPIC TAGS: tungsten iron silicon system, tungsten iron silicon alloy, tungsten iron silicon compound, tungsten silicon compound, iron silicon compound, tungsten iron compound

ABSTRACT: Eighty-five alloys of the tungsten-iron-silicon system were investigated in order to obtain a complete and accurate picture of the equilibria between the phases existing in the system. On the basis of obtained results, the isothermal (at 1000C) section of the ternary diagram was plotted (see Fig. 1 of the Enclosure). The $WFe_2$ and WFeSi compounds, which have a hexagonal, $MgZn_2$-type structure, form a continuous series of solid solutions (the $\lambda$-phase). Another ternary compound, $W_2FeSi$, is formed by a solid-state reaction. It has a crystal structure similar to that of σ-phases. In addition to

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L 13995-65
ACCESSION NR: AP4046451

$WFe_2$) the $W_6Fe_7$, $Fe_5Si_3$, $W_5Si_3$, FeSi, $FeSi_2$, and $W_5Si_2$ binary compounds were identified. In as-cast alloys, the $WFe_2$, $Fe_5Si_3$, and $W_2FeSi$ compounds were not detected. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Ivana Franko (L'vov State University)

SUBMITTED: 04Jul63 ENCL: 01 SUB CODE: MM, GC

NO REF SOV: 009 OTHER: 007 ATD PRESS: 3137

Card 2/3

L 13995-65
ACCESSION NR: AP4046451

ENCLOSURE: 01

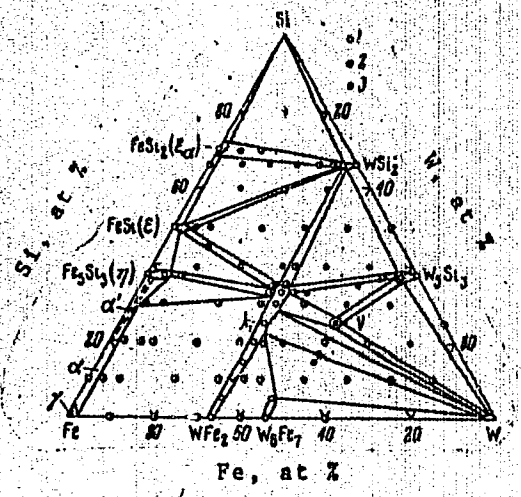


Fig. 1. Isothermal section of the W-Fe-Si phase diagram at 1000C

1 - Single phase alloy; 2 - two phase alloy; 3 - three phase alloy.

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L 55855-65 EWT(1)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b) Pi-4 IJP(c) JD/JG/GG

ACCESSION NR: AP5013114 UR/0370/65/000/002/0120/0127

669.017.3

AUTHOR: Gladyshevskiy, Ye. I. (L'vov); Shvets, G. N. (L'vov)

TITLE: The equilibrium diagram and crystal structures of V-Fe-Si ternary compounds

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1965, 120-127

TOPIC TAGS: phase equilibrium, vanadium compound, iron compound, silicon compound

ABSTRACT: The purpose of the article was to determine the ternary equilibrium diagram for V-Fe-Si and to specify the boundaries and crystal structures of single phase regions of ternary compounds. Alloys were examined in the cast state and annealed at 1200, 1000 and 800°C. X-ray and metallographic ($HF-HNO_3$ etchant) analysis of phase boundaries were used. The existence of four ternary compounds (χ, R, δ, and $\delta_1$ phase) was established. The χ-phase has a wide homogeneity region at temperatures close to the melting point (40-55 at. % Fe and 15-0 at. % Si), which narrows as the temperature is reduced. This phase has a body-centered cubic crystal structure; the lattice period in the homogeneity region varies from 8.81 to 8.85 Å when the V content is increased. The narrow region of homogeneity which includes

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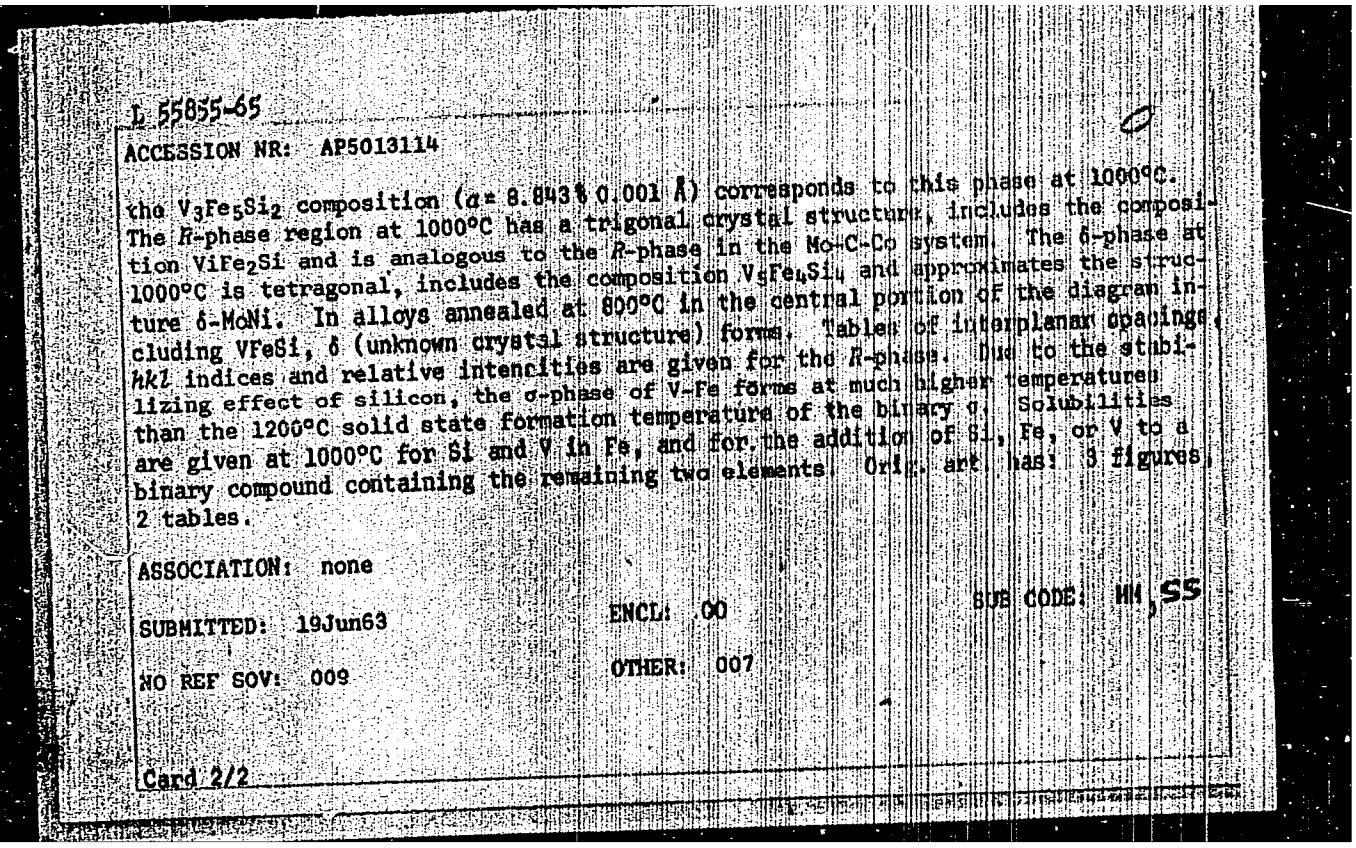

L 55855-65

ACCESSION NR: AP5013114

the $V_3Fe_5Si_2$ composition ($a = 8.843 \pm 0.001$ Å) corresponds to this phase at 1000°C. The *R*-phase region at 1000°C has a trigonal crystal structure, includes the composition $ViFe_2Si$ and is analogous to the *R*-phase in the Mo-C-Co system. The δ-phase at 1000°C is tetragonal, includes the composition $V_8Fe_4Si_4$ and approximates the structure δ-MoNi. In alloys annealed at 800°C in the central portion of the diagram including VFeSi, δ (unknown crystal structure) forms. Tables of interplanar spacings, *hkl* indices and relative intensities are given for the *R*-phase. Due to the stabilizing effect of silicon, the σ-phase of V-Fe forms at much higher temperatures than the 1200°C solid state formation temperature of the binary σ. Solubilities are given at 1000°C for Si and V in Fe, and for the addition of Si, Fe, or V to a binary compound containing the remaining two elements. Orig. art. has: 3 figures, 2 tables.

ASSOCIATION: none

SUBMITTED: 19Jun63 ENCL: 00 SUB CODE: MM, SS

NO REF SOV: 009 OTHER: 007

Card 2/2

L 52705-65 EWT(m)/EWP(w)/EPF(c)/EPF(n)-2/EWA(d)/T/EWP(t)/EWP(b)/EWA(c) Pn-4
IJP(c) JD/JG/WB
ACCESSION NR: AP5013120 UR/0370/65/000/002/0159/0166
669.017.13

AUTHOR: Savitskiy, Ye. M. (Moscow, L'vov); Baron, V. V. (Moscow, L'vov); Bychkova, M. I. (Moscow, L'vov); Bakuta, S. A. (Moscow, L'vov); Gladyshevskiy, Ye. I. (Moscow, L'vov)

TITLE: Phase diagram and certain properties of alloys of the Nb-Mo-Si system

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1965, 159-166

TOPIC TAGS: niobium alloy, molybdenum containing alloy, silicon containing alloy, alloy phase composition, alloy structure, alloy hardness, alloy oxidation resistance, alloy oxidation, alloy property

ABSTRACT: The phase composition and oxidation resistance of 117 alloys of the Nb-Mo-Si system have been investigated. The composition of the alloys tested corresponded to the $NbSi_2$-$MoSi_2$, NbSi-MoSi, $Nb_5Si_3$-$Mo_5Si_3$, $Nb_3Si$-$Mo_3Si$, Nb-$MoSi_2$, Mo-$NbSi_2$, and (Nb, Mo)-Si sections of the ternary diagram. No ternary compounds were found in the system.

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L 52705-65
ACCESSION NR: AP5013120

The $NbSi_2$ and $MoSi_2$ disilicides form a quasi-binary eutectic-type system with a limited solubility of the components: $NbSi_2$ dissolved 24 at% Mo (72 mol% $MoSi_2$) and $MoSi_2$ dissolved 3 at% Nb (about 9 mol% $NbSi_2$). Between the high-temperature modification β-$Nb_5Si_3$ and the $Mo_5Si_3$ occurs a mutual isomorphous substitution of Nb and Mo atoms in the lattice of the compounds in the entire concentration range. In annealed alloys the $Nb_5Si_3$ compound was in the form of a low-temperature modification α-$Nb_5Si_3$. At 800C, there are limited solid solutions: α-$Nb_5Si_3$ containing about 2 mol% $Mo_5Si_3$, and $Mo_5Si_3$ containing 60 at% Nb (96 mol% $Nb_5Si_3$). The $Mo_3Si$ compound dissolves up to 20 at% Nb. The $Nb_3Si$ compound was found to exist in pure form and also in equilibrium with a Nb-base solid solution in the cast and annealed alloys. The $Nb_3Si$ compound dissolved little or no Mo, and does not form at an Mo-content higher than 4 at%. In $NbSi_2$-$MoSi_2$ alloys the hardness of the $NbSi_2$ compound varied from 460 to 800 kg/mm$^2$. The high-temperature modification of the $Nb_5Si_3$ compound had a hardness of 840 kg/mm$^2$; the low-temperature modification had the highest hardness — 1100 kg/mm$^2$. The oxidation resist-

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L 52705-65

ACCESSION NR: AP5013120

ance of the $NbSi_2$ compound increased with additions of up to 5 at% Mo. The $HoSi_2$ compound alloyed with 0.5 wt% Nb had the highest oxidation resistance; in air at 1200C its weight gain was 0.05 $mg/cm^2 \cdot hr$. [MS]

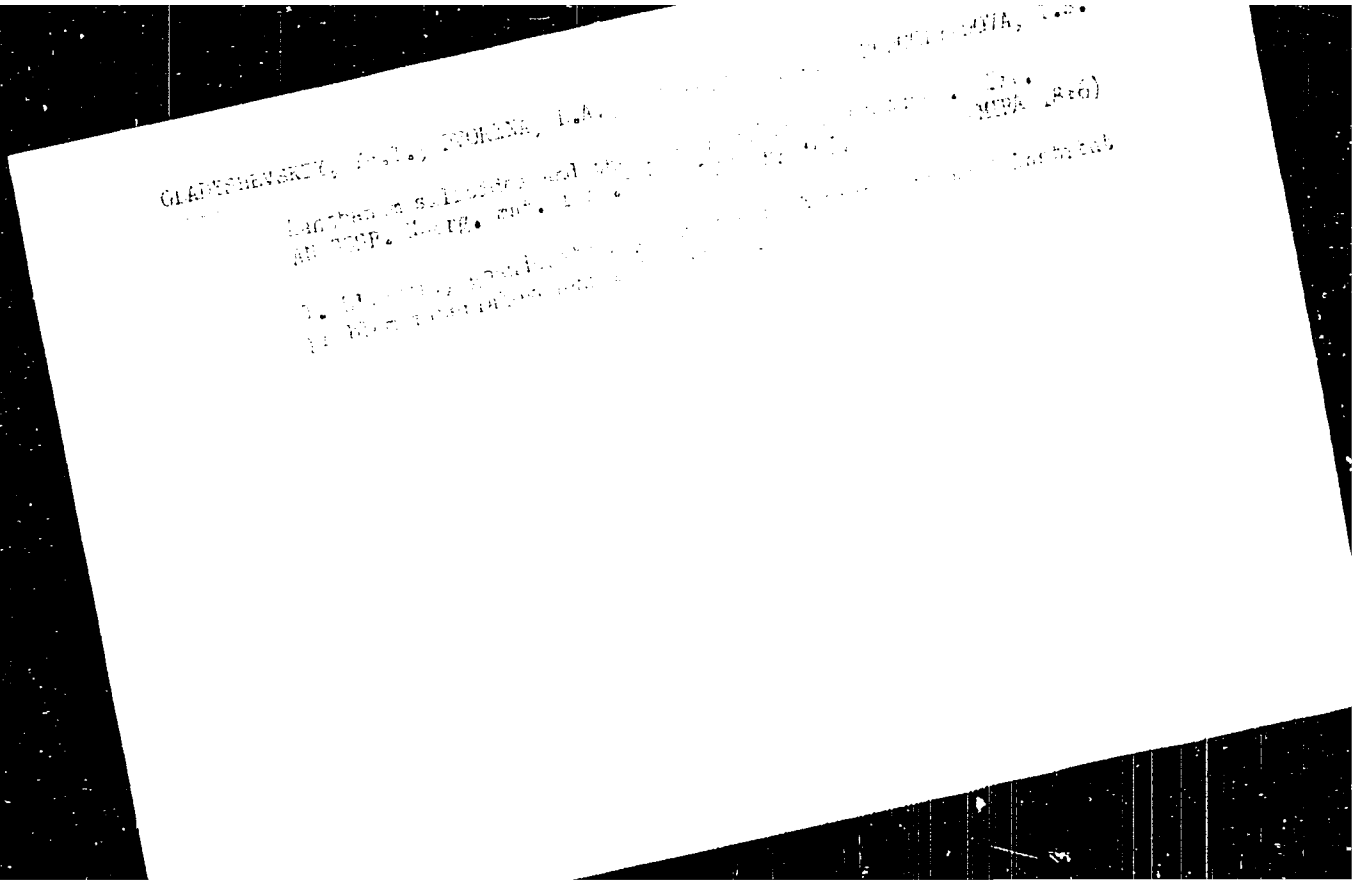
Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 16Sep64 ENCL: 00 SUB CODE: MM

NO REF SOV: 007 OTHER: 012 ATD PRESS: 4012

Card 3/3



L 47750-65 EWT(l)/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) Pu-4 IJP(c)
JD/JG/GG
ACCESSION NR: AP5011931 UR/0363/65/001/003/0354/0361

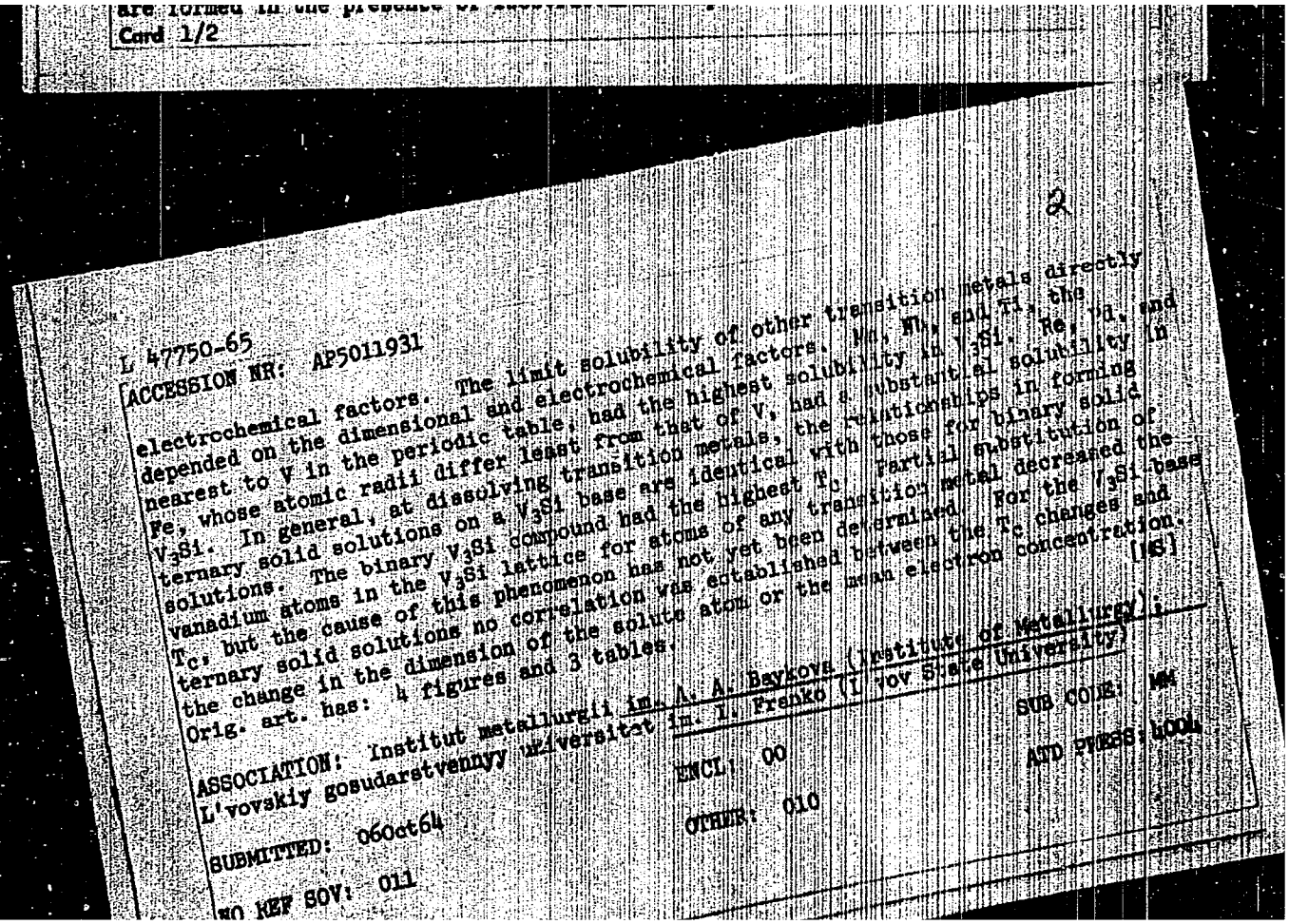
AUTHOR: Savitskiy, Ye. M.; Baron, V. V.; Yefimov, Yu. V.; Galyshevskiy, Ye. I.

TITLE: Solubility of certain transition metals in $V_3Si$ compound and their effect on the temperature of transition of the compound into superconducting state

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 354-361

TOPIC TAGS: vanadium silicide compound, transition metal containing compound, transition metal solubility, vanadium silicide superconductivity, superconductivity transition temperature

ABSTRACT: The solubility of Mo, Cr, Nb, Mn, Ti, Zn, Fe, Pt, Ce, and La in $V_3Si$-base alloys arc melted in a helium atmosphere or synthesized by the powder metallurgy



are formed in the presence of [illegible]

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L 47750-65

ACCESSION NR: AP5011931

electrochemical factors. The limit solubility of other transition metals directly depended on the dimensional and electrochemical factors. Mo, W, and Ti, the nearest to V in the periodic table, had the highest solubility in $V_3Si$. Fe, Co, and Fe, whose atomic radii differ least from that of V, had a substantial solubility in $V_3Si$. In general, at dissolving transition metals, the ternary solid solutions on a $V_3Si$ base are identical with those for binary solid solutions. The binary $V_3Si$ compound had the highest $T_c$ for partial substitution of vanadium atoms in the $V_3Si$ lattice for atoms of any transition metal decreased the $T_c$, but the cause of this phenomenon has not yet been determined. For the $V_3Si$ base ternary solid solutions no correlation was established between the $T_c$ changes and the change in the dimension of the solute atom or the mean electron concentration.

Orig. art. has: 4 figures and 3 tables. [JS]

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy); L'vovskiy gosudarstvennyy universitet im. I. Frenko (L'vov State University)

SUBMITTED: 06Oct64 ENCL: 00 SUB CODE: MM

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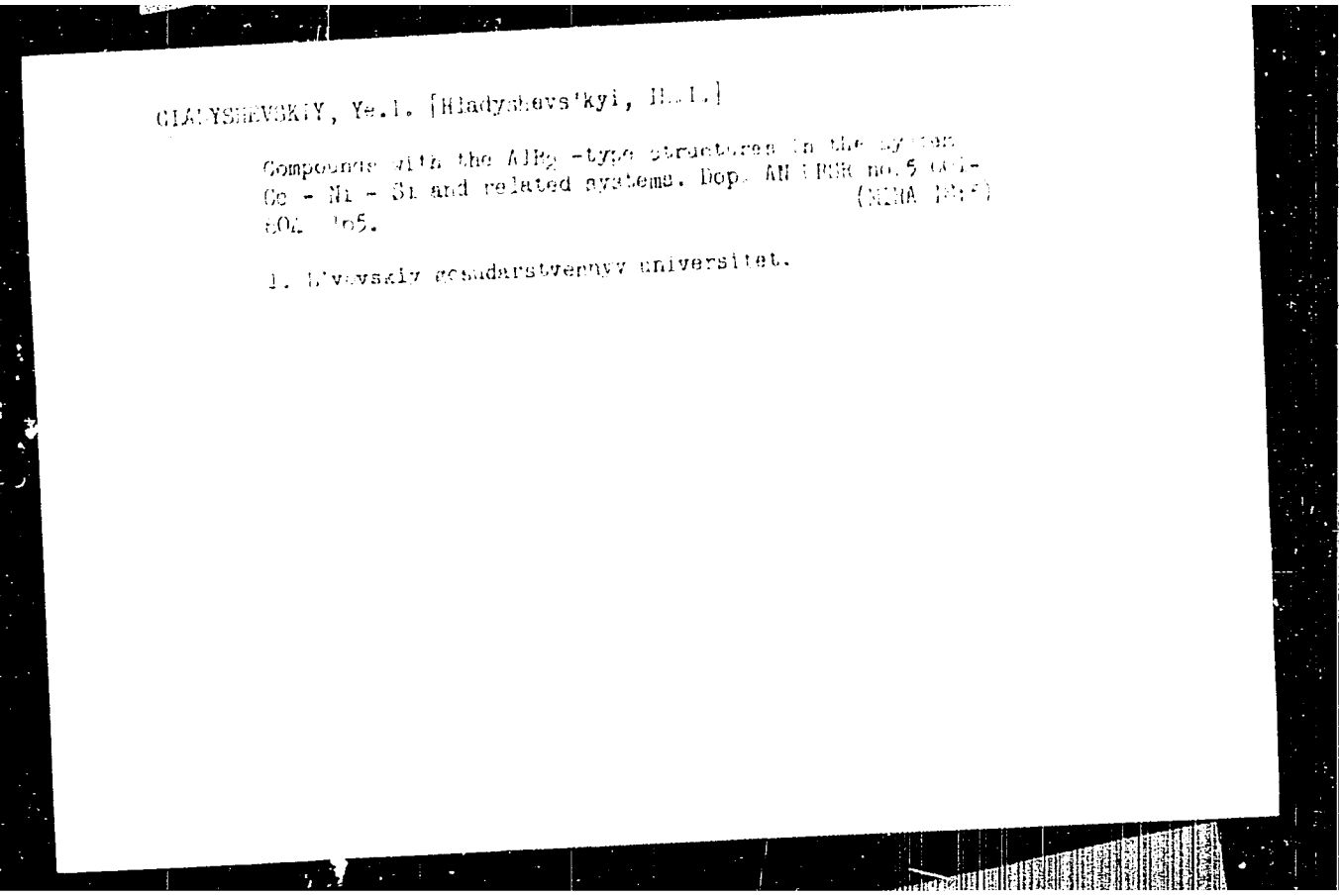


GLADYSHEVSKIY, Ye.I. [Hladyshevs'kyi, E.I.]

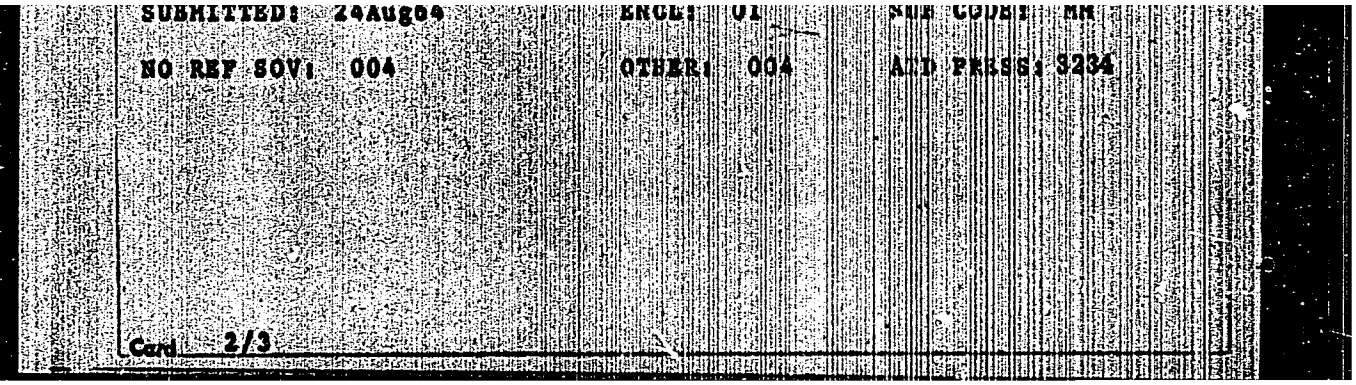
Compounds with the $AlB_2$-type structures in the system Co - Ni - Si and related systems. Dop. AN URSR no.5 (SCHA [illegible])
[illegible] 'o5.

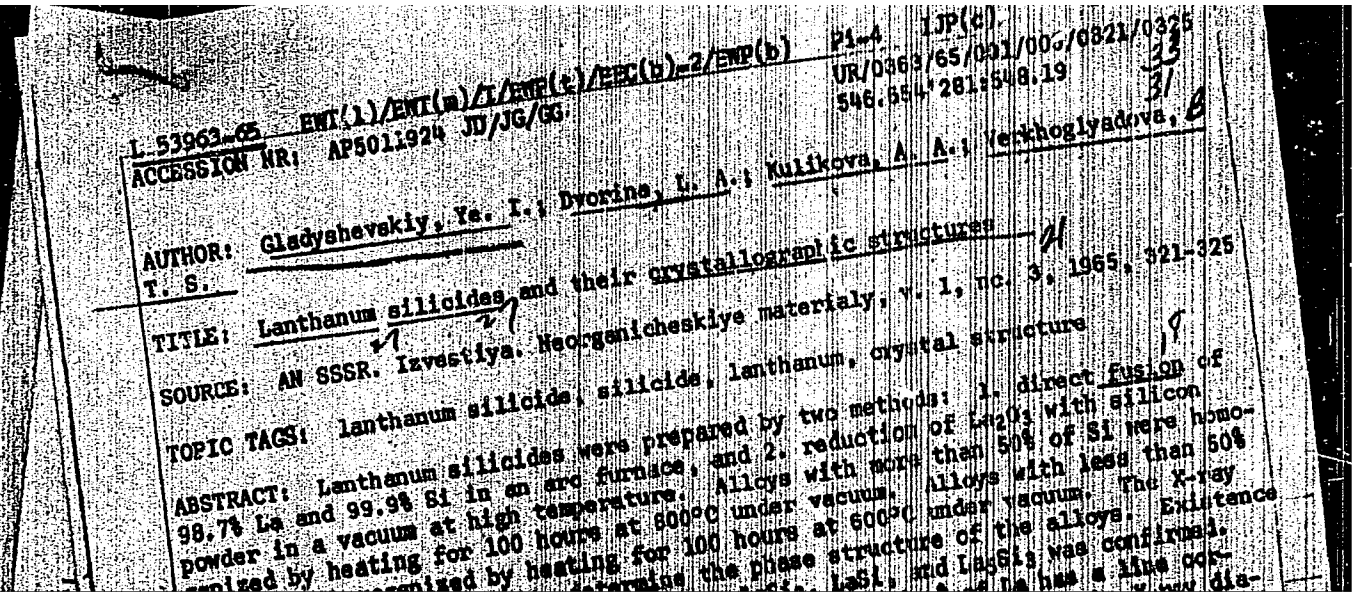
1. L'vovskiy gosudarstvennyy universitet.

L 41417-65
ACCESSION NR: AP5009370

conducting state, the crystal-lattice parameter, and the content of tin (see Fig. 1 of the Enclosure). All investigated alloys are superconductors and have the same electron concentration. Orig. art. has: 1 figure and 1 table. [ND]

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy); L'vovskiy gosudarstvennyy universitet im. Franko (L'vov State University)





L 53963-65 EWT(1)/EWT(m)/T/EWP(t)/ETC(b)-2/EWP(b) P1-4 IJP(c)
ACCESSION NR: AP5011924 JD/JG/GG UR/0363/65/001/003/0321/0325
546.654'281:548.19

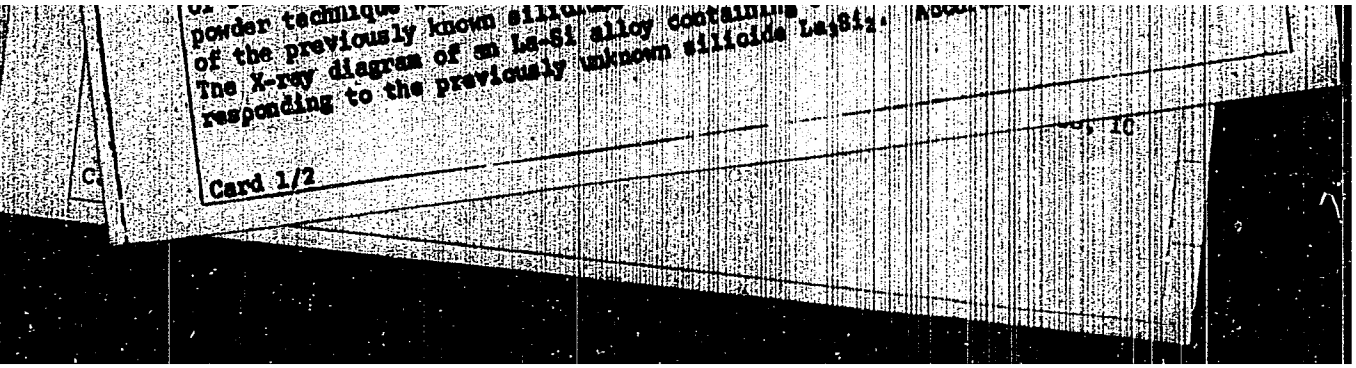
AUTHOR: Gladyshevskiy, Ye. I.; Dvorina, L. A.; Kulikova, A. A.; Verkhoglyadova, T. S.

TITLE: Lanthanum silicides and their crystallographic structures

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 321-325

TOPIC TAGS: lanthanum silicide, silicide, lanthanum, crystal structure

ABSTRACT: Lanthanum silicides were prepared by two methods: 1. direct fusion of 98.7% La and 99.9% Si in an arc furnace, and 2. reduction of $La_2O_3$ with silicon powder in a vacuum at high temperature. Alloys with more than 50% of Si were homogenized by heating for 100 hours at 600°C under vacuum. Alloys with less than 50% [illegible] by heating for 100 hours at 600°C under vacuum. The X-ray [illegible] the phase structure of the alloys. Existence of $LaSi_2$, and $LaSi$ was confirmed. [illegible] has a like cor- [illegible] dia-



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ACCESSION NR: AP5011924

gram, the $La_3Si_2$ belongs to the tetrahedral system with $c/a = 0.572$. Its lattice constants ($a = 7.87 \pm 0.00$) Å and $c = 450 \pm 0.01$ Å) indicate that the $La_3Si_2$ structure corresponds to the $U_3Si_2$ structure type (symmetry group $P4/mbm - D_{4h}^5$). In La-Si alloys containing from 37.5 to 45 atomic % of La an equilibrium between monosilicide LaSi and a new silicide $LaSi_{2-n}$ was established. The $LaSi_{2-n}$ silicide is formed readily by either heating an alloy for 2 hours at 1800°K or for 3 hours at 1700°K. The $LaSi_{2-n}$ has an $\alpha$-$GdSi_2$ type structure. It belongs to the rhombic system, and its lattice constants are: $a = 4.272$ Å, $b = 4.184$ Å, and $c = 14.02$ Å. Orig. art. has: 4 tables and 2 formulas.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. I. Franko (Lvov State University); Institut problem materialovedeniya akademii nauk UkrSSR (Institute of Material Science, Academy of Sciences UkrSSR)

SUBMITTED: 05May64 ENCL: 00 SUB CODE: SS, IC

NO REF SOV: 002 OTHER: 005

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L 58699-65 EWT(1)/EWT(m)/EWP(1)/EPF(n)-2/EWG(m)/EWP(e)/EPR/T/EWP(t)/EWP(b)/
EEC(b)-2/EWA(c) Pe-5/Pi-4/Pu-4 IJP(c) JD/JG/GO/AT/WH

ACCESSION NR: AP5016584 UR/0363/65/001/005/0702/0705
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546.659'281

AUTHOR: Gladyshevskiy, Ye. I.; Kripyakevich, P.I.

TITLE: Crystal structure of the trisilicides of lanthanum, cerium, praseodymium, neodymium and samarium

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 5, 1965,702-705

TOPIC TAGS: lanthanum silicide, cerium silicide, praseodymium silicide, neodymium silicide, samarium silicide, silicide crystal structure, xray diffraction, rare earth silicide

ABSTRACT: A single crystal of $Ce_5Se_3$ was analyzed first. It was found to have a tetragonal symmetry. A rotating-crystal x-ray photograph gave the following lattice constants: $a = 7.90$ A, $c = 13.76$ A, $c/a = 1.74$. A table listing hkl, $d_{hkl}$, and I obtained from the

are tabulated. The $M_5Si_3$ compounds, where M is a rare earth metal, form a

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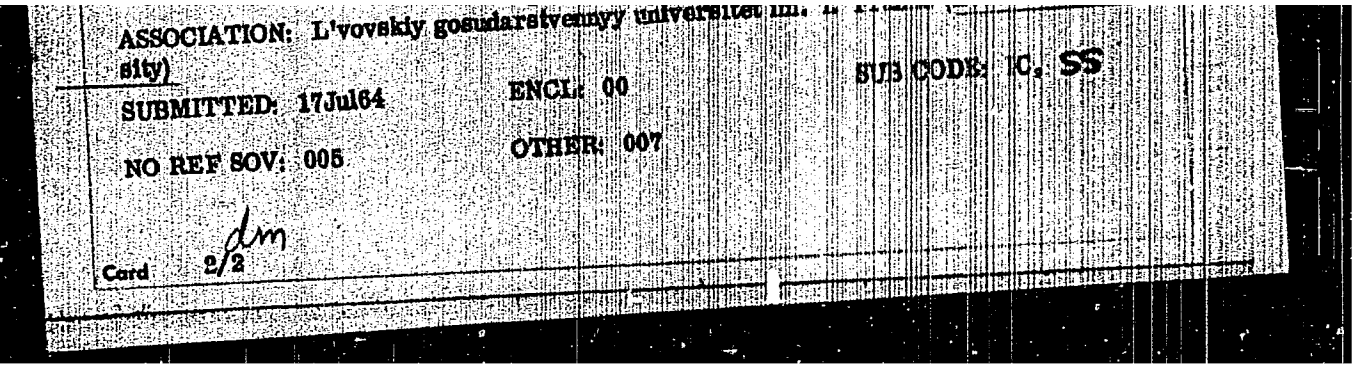
ACCESSION NR: AP5016584

morphotropic series in which, as the atomic number of M increases and atomic radius decreases), a transition from the $Cr_5B_3$ type to the $Mn_5Si_3$ type takes place. A common feature of the structural types of $Cr_5B_3$ and $Mn_5Si_3$ is the presence around smaller atoms [illegible] in the form of a trigonal prism whose vertices are [illegible] of Cr-Be



L 58700-65 EWT(1)/EWP(e)/EWT(m)/EWP(1)/EPF(n)-2/EWG(m)/EPR/T/EWP(t)/EWP(b)/
EPR(b)-2/EWA(m) Ps-4/Pi-4/Pu-4 IJP(c) JD/JG/GG/AT/WH

ACCESSION NR: AP5016585 UR/0363/65/001/005/0706/0710
546.654'281 + 546.655'281 + 546.
656'281.548.19

AUTHOR: Gladyshevskiy, Ye. I.

TITLE: The disilicides of lanthanum, cerium and praseodymium and their crystal structures

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 5, 1965, 706-710

TOPIC TAGS: lanthanum silicide, cerium silicide, praseodymium silicide, silicide crystal structure, xray diffraction

ABSTRACT: Alloys of La, Ce, and Pr with 40 at. % Si were prepared by electric arc fusion in He, and x-ray powder analysis was carried out on samples annealed for 50 hr. at 800C. The La-Si alloy was found to be the pure compound $La_3Si_2$; it belongs to a tetragonal system, and c/a = 0.572. The hkl, $\sin^2\theta$ and I values for $La_3Si_2$ are tabulated, as are the interatomic distances, coordination numbers, and coordination polyhedra. There are two $La_3Si_2$ formula units in the unit cell. These data show (see Fig. 1 of the Enclosure) that $La_3Si_2$ belongs to the structural type of $U_3Si_2$ (space group P4/ (mbm - $D_{4h}^5$). The dimensions of

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