

FESENKO, V.V.; YEREMENKO, V.N.; VASILIU, M.I.

Surface tension of liquid metallic solutions. Part 2: Surface
tension of the system nickel - copper. Zhur.fiz.khim. 35
no.8:1750-1751 Ag '61. (MIRA 14:8)

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

(Nickel--Copper alloys)
(Surface tension)

NAYDICH, Yu. V.; YEREMENKO, V.N.

"Large drop" method for the determination of the surface tension and density of molten metals at high temperatures. Fiz. met. i metalloved. 11 no.6:883-888 Je '61. (MIRA 14:6)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR.
(Surface tension)
(Metals in high temperature)

NAYDICH, Yu.V.; YEREMENKO, V.N.; FESENKO, V.V.; VASILIU, M.I.; KIRICHENKO, L.F.

Temperature dependence of the surface tension of liquid cooper. Zhur.
fiz. khim. 35 no.3:694-695 Mr '61. (MIRA 14:3)

1. Institut metallokeramiki i spetsial'nykh splavov.
(Surface tension) (Copper)

21655

S/076/61/035/006/007/013
B127/B203

1.1600

AUTHORS: Yeremenko, V. N. and Nizhenko, V. I.

TITLE: Effect of titanium admixtures on the surface tension of nickel and cobalt and on their interfacial tension with aluminum oxide

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 6, 1961, 1301-1306

TEXT: The present paper deals with the effect of titanium admixtures on the surface tension of Ni and Co, which metals are used in powder metallurgy as binding agents for titanium carbide, titanium nitride, or titanium boride. The surface tension is determined by the method of the drop lying on a horizontal base. For the alloys, 99.99 % pure Ni and Co, as well as titanium iodide with less than 0.07 % impurities, were fused together in the arc furnace. The tables of Bashforth and Adams in a modified form were used to calculate the surface tension. Besides, a new table was compiled with the values ϕ in direct dependence on x/z of the drop (Fig. 1) at $\psi = 60^\circ$. The function was $\phi = b^2/\beta(2x)^2$. The surface tension σ was calculated from $\sigma = \phi(2x)\Delta\rho g$. The error of measurement was

Card 1/6 ζ

21,655
S/076/61/035/006/007/013
B127/B203

Effect of titanium admixtures on...

3-5 %. In the system Co,Ti,Al₂O₃, the study was conducted in vacuum at 1.10⁻⁴ mm Hg and 1600°C. The titanium content was 1.96 %. Titanium admixtures of 0.23 g-atom/l and more showed no effect on the surface tension. With 0.05 g-atom/l Ti, the interfacial tension at the boundary Co-Al₂O₃ dropped by more than 1000 erg/cm². The adhesive power increased simultaneously with the reduction of interfacial tension. Thus, a considerable interaction between alloy and Al₂O₃ base took place. In the system Ni,Ti, and Al₂O₃, the same results were obtained as for Co. At a vacuum of 1.10⁻⁴ mm Hg, the specimen was always covered with a thin, but noticeable oxide layer during the experiment. The same phenomenon appeared in the case of BeO instead of Al₂O₃ as a base; likewise, in higher vacuum obtained by freezing the vapors of the oil diffusion pump with liquid N₂. On addition of Ti, a reduction of the Ni surface tension was observed. All this changed abruptly if the experiments were made in H₂ atmosphere. In this case, no activation by Ti on the interface Ni-gas was observed. The interfacial activity increased at the same time. The

Card 2/6 L

24655
S/076/61/035/006/007/013
B127/B203

Effect of titanium admixtures on...

same occurred by melting the specimen in H_2 medium, and subsequent separation of H_2 by evacuation. In the system Sn, Ti, Al_2O_3 , a high surface activity of titanium was observed at the interface of the liquid Sn. This effect is explained by the adsorption of O_2 residues from the vacuum by Ti. O_2 causes the surface activity. Adsorption of Ti at the metal - Al_2O_3 interface. In the Ni and Co system, Ti develops higher interfacial activity due to high formation energy of the lowest Ti oxide. With the use of the Gibbs adsorption equation, the excessive Ti concentration at the interface metal - Al_2O_3 was calculated (by graphical differentiation of the curve). Fig. 4 shows the results for Co - Ti and Ni - Ti on Al_2O_3 . In the maximum of the curve, the corresponding thickness of the adsorption layer is $2.7 \cdot 10^{-8}$ cm. It is assumed that the lattice nodes occupied by O ions are the active centers of adsorption of Ti atoms on the Al_2O_3 surface. In maximum adsorption, every Ti is bound to an O. The authors mention joint papers by V. N. Yerezenko with Yu. V. Naydich and

Card 3/8 1/

24655

S/076/61/035/006/007/013
B127/B203

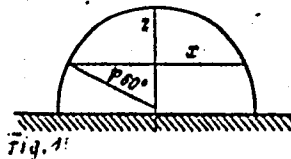
Effect of titanium admixtures on...

A. A. Nosonovich: Elektronika, no. 4, 136, 1959; Zh. fiz. khimii, 34, 1186, 1960. There are 4 figures, 2 tables, and 11 references: 8 Soviet-bloc and 3 non-Soviet-bloc. The most recent reference to the English-language publication reads as follows: Kingery W. D., J. Amer. Ceram. Soc. 37, 42, 1954.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov (Institute of Powder Metallurgy and Special Alloys)

SUBMITTED: September 25, 1959

Fig. 1: Diagram for calculating the surface tension from the form of the drop.



Card 4/04

S/C76/61/035/008/005/016
B101/B218AUTHORS: Fesenko, V. V., Yeremenko, V. N., and Vasiliu, M. I. (Kiyev)TITLE: Study of the surface tension of liquid metal solutions.
II Surface tension of alloys of the system nickel-copper

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 8, 1961, 1750-1751

TEXT: The authors attempted to check how far Cu-Ni alloys represent ideal systems and obey Raoult's law. For this purpose, the surface tension of Cu, Ni, and their alloys was determined by measuring the maximum pressures in a gas bubble at 1550°C. Measurements were made in pure He or H₂. Apparatus and method have already been described by the authors (Sb. "Stroyeniye veshchestva i spektroskopiya" (Structure of substance and spectroscopy), 78, 1960, Izd. AN SSSR). The total amount of impurities in the metals used was not higher than 0.1%. The alloys of different composition were molten in crucibles of pure Al₂O₃ in a high vacuum. Their composition was checked by chemical analysis. For the surface tension of Cu-Ni alloys at 1550°C, the authors give the following values (rounded-off to 5 erg/cm²):

Card 1/3

S/076/61/035/008/005/016
B101/B218

Study of the surface tension ...

atom% of Cu	, erg/cm ²
0	1735
10	1655
28	1545
50	1430
67	1370
79	1300
100	1265

The data for nickel are in good agreement with those by W. D. Kingery, M. Humenik (see below). The data for copper are much higher than those found by other scientists, as, e.g., E. E. Libman (see below). This discrepancy is explained by the fact that the authors used high-purity copper (99.997%) and conducted the measurements under conditions that excluded contamination. The

experimental data are in good agreement with those calculated according to the Shishkovskiy equation. The constants of this equation were calculated according to A. A. Zhukhovitskiy (Zh. fiz. khimii, 18, 214, 1944). This agreement confirms that the system Cu-Ni is ideal at 1550°C. It follows from the data that the copper in Cu-Ni alloys is surface-active within the entire concentration range investigated. A paper by I. T. Sryvalin, O. N. Yesin, Yu. P. Nikitin (Izv. vuzov, Tsvetnaya metallurgiya, 4, 66, 1958) is mentioned. There are 1 figure, 1 table, and 9 references: 5 Soviet-bloc and 4 non-Soviet-bloc. The two references to English-language publications read as follows: W. D. Kingery, M. Humenik, J. Phys. Chem., 57, 359, 1953;

Card 2/3

Study of the surface tension ...

S/076/61/035/008/005/016
B101/B218

E. E. Libman, Phys. Rev., 29, 911, 1927.

ASSOCIATION: Akademiya nauk USSR, Institut metallokeramiki i spetsial'nykh
splavov, g. Kiyev (Academy of Sciences UkrSSR, Institute of
Powder Metallurgy and Special Alloys, Kiyev)

SUBMITTED: November 23, 1959

Card 3/3

PHASE I BOOK EXPLOITATION

SOV/6101

Yeremenko, Valentin Nikiforovich.

Mnogokomponentnyye splavy titana (Multicomponent Titanium Alloys) Kiyev, Izd-vo AN UkrSSR, 1962. 209 p. 2500 copies printed.

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

Resp. Ed.: I. M. Fedorchenko, Academician, Academy of Sciences UkrSSR; Ed. of Publishing House: Z. S. Pokrovskaya; Tech. Ed.: A. A. Matveychuk.

PURPOSE: This book is intended for researchers in the field of metal science, and for designers in the aircraft, shipbuilding, machine-building, and chemical industries. It may also be useful to students specializing in these fields of design.

COVERAGE: The book, which constitutes the second part of the author's monograph "Titanium and Its Alloys" [published in 1955], reviews the structures, properties, and applications of multicomponent titanium alloys which have been

Card 1/2

2

Multicomponent Titanium Alloys

SOV/6101

investigated up to the present time. The interaction between components is described and equilibrium diagrams of titanium-base systems are analyzed. Along with equilibrium data, information on technological, physical, mechanical, and other properties of titanium alloys is given. In addition, various heat-treatment methods applied to these alloys are discussed. In all, 122 ternary titanium-base systems and 52 quaternary and quinary systems are reviewed. Since these comprise all the multicomponent systems which have been investigated up to the present time, the book can serve as a comprehensive handbook in its field. No personalities are mentioned. The description of each titanium-base alloy is accompanied by Soviet and non-Soviet references.

TABLE OF CONTENTS:

Introduction	3
Ternary Systems	5
Ti — Ag — Al	6
Ti — Al — B	9
Card 2/	
2	

PHASE I BOOK EXPLOITATION SOV/6032

Yeremenko, V. N., Resp. Ed.; I. N. Frantsevich, G. V. Samsonov,
I. M. Fedorchenko, G. S. Pisarenko, V. V. Grigor'yeva, and
V. I. Nizhenko, eds.

Poverkhnostnyye yavleniya v metallakh i splavakh i ikh rol' v
protssakh poroshkovoy metallurgii (Surface Phenomena in
Metals and Alloys and Their Role in Powder-Metallurgy Processes)
Kiyev, Izd-vo AN USSR, 1961. 213 p. 1710 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainiskoy SSR. Institut metal-
lokeramiki i spetsial'nykh splavov.

Ed. of Publishing House: Z. S. Pokrovskaya; Tech. Ed.: A. M. Lisovets.

PURPOSE: This collection of articles is intended for scientific
research workers, engineers specializing in metals, and metal-
lurgists. It may also be useful to advanced students at schools
of higher education.

Card 1/7

Surface Phenomena in Metals (Cont.)

SOV/6032

COVERAGE: Articles of this collection discuss the role of surface phenomena in powder metallurgy processes and in processes of the strong bonding of various substances. Theoretical calculations of the surface tension of some carbides and nitrides are presented. The book also reviews modern methods for studying the surface properties of metals at high temperatures and presents data on the surface tension of refractory metals and of binary metal systems. Particular attention is given to the effect of various additions on the surface tension of metals and on the interphase tension at the boundary between metals and various refractory compounds. Data on the effect of thin metal coatings on the structural and mechanical properties of metals are also presented. No personalities are mentioned. Each article is accompanied by references, mostly Soviet.

TABLE OF CONTENTS:

Foreword

3

Card 2/7

Surface Phenomena in Metals (Cont.)	SOV/6032	
Yeremenko, V. N. Physicochemical Fundamentals of the Formation of a Cermet		5
Semenchenko, V. K. On the Relationship Between Volume and Surface Properties of Metals and Alloys		17
Bal'shin, M. Yu. On the Problem of the Relationship Between Surface Characteristics and the Interface Tension of Materials and Their Deformability in Creep and Sintering		26
Yesin, O. A. On the Isotherms of Surface Tension		33
Pugachevich, P. P., and V. B. Lazarev. Surface Phenomena in Ternary Metal Solutions		39
Fesenko, V. V., V. N. Yeremenko, and M. I. Vasiliu. Surface Tension of Copper-Nickel Alloys		48
Zadumkin, S. N. Approximate Calculation of the Surface Energy of Some Carbides and Nitrides with NaCl-Type Lattices		51
Card 3/7		

Surface Phenomena in Metals (Cont.)

SOV/6032

Yeremenko, V. N., Yu. N. Ivashchenko, and B. B. Bogatyrenko. Surface Tension of Pure Iron and Alloys of the Fe-C System	56
Naydich, Yu. V., V. N. Yeremenko, V. V. Fesenko, M. I. Vasilii, and L. F. Kirichenko. Temperature Dependence of the Surface Tension of Pure Copper	62
Pugachevich, P. P., and V. I. Yashkichev. Determination of the Surface Tension of Molten Metals at High Temperatures	70
Timofeyevicheva, O. A., and P. P. Pugachevich. Temperature Dependence of Surface Tension of Indium	75
Yeremenko, V. N., and V. I. Nizhenko. Effect of Titanium and Titanium Carbide Additions on the Surface Tension of Nickel and Cobalt	85
Presnov, V. A., and A. P. Vyatkin. Wetting of Germanium by Indium and Fused Contacts Between Semiconductors and Metals	91
Card 4/7	

Surface Phenomena in Metals (Cont.)

SOV/6032

Yeremenko, V. N., and Yu. V. Naydich. Surface Activity of Oxygen in the Silver-Oxygen System 100

Perminov, A. A., S. I. Popel', and N. S. Smirnov. Adhesion of Molten Silicate to Iron and Its Alloys 105

Kuznetsov, V. A. Investigation of Surface Tension and Electrocapillary Phenomena in Some Binary Metal Alloys 111

Fesenko, V. V. On the Problem of Determining Surface Tension by the Method of Maximum Pressure in the Gas Bubble 123

Vashchenko, K. I., and A. P. Rudoy. Method and Unit for Determining the Surface Tension of Cast Iron 130

Presnov, V. A. On the Physicochemical Nature of the Strong Bond Between Heterogeneous Substances 140

Tsarevskiy, V. B., and S. I. Popel'. Adhesion of Binary Iron-Base Melts to Solid Aluminum Oxides 146

Card 5/7

Surface Phenomena in Metals (Cont.)

SOV/6032

- Yeremenko, V. N., and N. D. Lesink. Investigation of the Kinetics of the Impregnation of Porous Solids With Liquid Metals 152
- Yeremenko, V. N., and V. V. Fesenko. Rate of Impregnation of Titanium Carbide With Copper-Nickel Alloys 178
- Geguzin, Ya. Ye., and N. N. Ovcharenko. On the Mechanism and Kinetics of the Process of High-Temperature Self-Healing of Defects on the Surface of Crystalline Solids 182
- Goryunov, Yu. V., N. V. Pertsov, P. A. Rebinder, and Ye. D. Shchukin. Effect of Thin Surface-Active Metal Coatings on the Structural and Mechanical Properties of Single-Crystal and Polycrystal Metals 184
- Kachanova, L. A., I. A. Andreyeva, Ye. D. Shchukin, and V. I. Likhtman. Surface Phenomena in the Processes of Brittle Fracture of Metal Crystals 194

Card 6/7

Surface Phenomena in Metals (Cont.)

SOV/6032

Dekartova, N. V., and V. N. Rozhanskiy. Investigation of Relative Surface Activity of Some Metals Toward Zinc by the Method of Internal Friction 202

Bal'shin, M. Yu. Some Remarks on the Article "On the Problem of the Theoretical Calculation of Surface Tension and of Some Other Characteristics of Solids and Liquids" 209

Resolution of the Meeting of the Interinstitutional Seminar on Problems of Heat Resistance, and of the Interinstitutional Colloquium on Surface Phenomena in Melts 212

AVAILABLE: Library of Congress

SUBJECT: Metals and Metallurgy

Card 7/7

DV/wrc/jw
9/10/62

33752

S/021/62/000/002/007/010
D299/D304

18,1255 1530

AUTHORS: Yeremenko, V. N., Tret'yachenko, L. O. and Holubenko, Z.P.

TITLE: On the boundary of the σ -phase in a tantalum-vanadium system

PERIODICAL: Akademiya nauk UkrRSR. Dopovidi. no. 2, 1962, 192-194

TEXT: The tantalum-vanadium alloys were prepared by the method of Yeremenko et al. (Ref. 2: ZhNKh, 5, 2290, 1960). Then they were annealed and tempered at 4 different regimes, ranging from temperatures of 1000 to 1400°C, and lasting from 5 to 200 hours. The boundary of the σ -phase was determined metallographically. The microstructure was determined by means of various etchants, depending on the composition of the alloy. A table shows the phase composition of the alloys at various temperatures. Four types of microstructure are shown in figures. The first shows the structure of a homogeneous β -solid solution alloy; the grain boundaries are sharp and clean. Another figure shows the microstructure of the

Card 1/3

33752

S/021/62/000/002/007/010
D299/D304

On the boundary of ...

same alloy after low-temperature annealing; thereby small σ -phase formations are noted. Further, an alloy with a considerable amount of σ -phase is shown, and (lastly) the microstructure in the region of homogeneous σ -phase. The σ -phase has very great hardness. The microhardness, determined by means of the device μ MT-3 (PMT-3), of the σ -phase in alloys containing 32.0 and 41.5 atom% Ta, ranged between 1070 - 1260 kg/mm². The line digrams (of an X-ray picture) of a specimen containing 32.0 atom% Ta is shown. Nearly all the lines of the σ -phase were identified by the tetragonal lattice. Calculation of lattice parameters showed that the σ -phase in alloys containing 32.0 atm% Ta has parameters $a = 6.15$ kX and $c = 8.85$ kX. According to the data of W. Rostoker and A. Yamamoto ((Ref. 1: Trans. Amer. Soc. Metals, 46, 1136, 1954), these parameters are $a = 6.104$ kX and $c = 8.833$ kX. A state diagram of the Ta-V system is shown, using data of Ref. 1 (Op.cit.) and the solidus-temperatures found in Ref. 2 (Op.cit.). There are 3 figures, 1 table and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: W. Rostoker, A.

Card 2/3

33752

S/021/62/000/002/007/010
D299/D304

On the boundary of ...

Yamamoto, Trans. Amer. Soc. Metals, 46, 1136, 1954.

ASSOCIATION: Instytut metalokeramiky i spetssplyviv AN UkrRSR (In-
stitute of Powder Metals and Special Alloys of the AS
UkrRSR)

PRESENTED: by Academician I. M. Fedorchenko of the AS UkrRSR

SUBMITTED: July 15, 1961

X

Card 3/3

YEREMENKO, V.N.; NAYDICH, Yu.V.; LAVRINENKO, I.A.

Studying compaction processes during sintering in presence of
a liquid phase. Porosh.met. 2 no.4:72-83 J1-Ag '62.

(MIRA 15:8)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.
(Sintering) (Dilatometry)

33278

S/078/62/007/002/004/019
B119/B110

18.7540

AUTHORS: Naydich, Yu. V., Yeremenko, V. N., Kirichenko, L. F.

TITLE: Surface tension and density of liquid alloys of the copper-aluminum system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 2, 1962, 333 - 336

TEXT: Surface tensions and densities of Cu-Al alloys of varying mixing proportions were studied. The alloys were fused in crucibles of pure over-burned and recrystallized aluminum oxide, in which also the further tests were made. Surface tension was measured by a method elaborated by the first two authors (Ref. 9: Fizika metallov i metallovedeniye, 11(5), 883 (1961); Ref. 11: Zmochuvannya ridkimi metallami poverkhen' tugoplavkikh spoluk, Izd. AN USSR, Kiyev, 1958), in which particularly large and strictly symmetrical drops of the test substance are used; thus, the error in measurement is significantly reduced. The density of the melts was determined from the volume of the drop (ascertained from the ratio $d/2h$, where d is the equatorial diameter and h the height of the drop on d , and with the aid of a table of F. Bashfort et al. (see below)) and from its weight. X

Card 1/3

Surface tension and density...

33278
S/078/62/007/002/004/019
B119/B110

Measurements were made in vacuo ($1 - 2 \cdot 10^{-5}$ mm Hg) between 700 and 1250°C. Results: The temperature coefficient of the density of the alloys is strongly dependent on the Cu-Al mixing ratio (maximum $d\rho/dT$ at $\sim 95\%$ by weight Al). The isotherm of the specific volumes of the alloys (measured at 1100°C) shows that fusion of the components results in volume contraction owing to chemical interaction. The surface tension of the alloys decreases isothermally (measured at 1100 and 1250°C) with increasing Al content. (Surface tension of Cu at the temperatures indicated $\sim 1320 - 1350$ erg/cm², of Al ~ 800 erg/cm²). In accordance with the stoichiometric proportion of CuAl₃, the isotherms of the alloys show a break after which the surface tension decreases very rapidly with increasing Al content. For the isotherm at 1250°C the break becomes less sharp owing to the increasing dissociation of Cu₃Al at elevated temperatures. According to the classification of N. A. Trifonov (Ref. 14: V. Ya. Anosov, S. A. Pogodin. Osnovnyye nachala fiziko-khimicheskogo analiza. Izd-vo AN SSSR, 1947 (Principles of physicochemical analysis. Published by AS USSR, 1947)) the isotherm of the surface tension of the Cu-Al system belongs to the third type, i. e., the Cu₃Al compound formed is surface-active as to one

Card 2/3

Surface tension and density...

33278
S/078/62/007/002/004/019
B119/B110

component (Cu), but surface-inactive as to the other (Al). The following papers are mentioned: Yu. A. Klyachko (Ref. 5: Zavodsk. laboratoriya, 6, 1376 (1937)); S. V. Sergeyev and T. I. Khomchenovska (Ref. 6: Fiziko-khimicheskiye svoystva metallov, Oborongiz, 1952); V. N. Yeremenko, V. I. Nizhenko, N. Levi, B. B. Bogatyrenko (Ref. 16: Ukr. khim. zhurn. (in print)). There are 4 figures and 16 references: 13 Soviet and 3 non-Soviet. The reference to the English-language publication reads as follows: F. Bashfort, I. Adams. An attempt to test theories capillary action, Cambridge, 1883.

ASSOCIATION: Institut metallokeramiki spetsial'nykh splavov Akademii nauk USSR (Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences UkrSSR). Kiyevskiy gosudarstvennyy universitet (Kiev State University) X

SUBMITTED: February 13, 1961

Card 3/3

FESENKO, V.V.; VASILIU, M.I.; YEREMENKO, V.N.

Surface tension of liquid metal solutions. Part 3. Zhur. fiz.
khim. 36 no.3:518-520 Mr '62. (MIRA 17:8)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

S/078/62/007/007/013/013
B119/B101

19, 1775

AUTHORS: Yeremenko, V. N., Velikanova, T. Ya.

TITLE: Investigation of the system tin - titanium within the range rich in tin

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 7, 1962, 1750 - 1752

TEXT: The structure of Sn - Ti alloys containing 0 - 34.6 % by weight of Ti was studied. Results: Ti in concentrations of 0.008 - 20 % by weight in the alloy lowers the crystallization point of Sn (232°C) by 1 - 2°C. All alloys containing 0.008 - 18.98 % Ti show two phases only. Crystals in the intermetallic phase are evenly distributed through the mass of tin. The solubility of Ti in Sn in the solid state is 0.006 - 0.008 % Ti. In Sn - Ti alloys with 8.3 - 34.6 % Ti a nonvariant conversion occurs at ~790°C, the nature of which is not yet clarified. There are 1 figure and 2 tables.

SUBMITTED: November 1, 1961

Card 1/1

S/659/62/008/000/014/028
I048/I248

AUTHORS: Yeremenko, V.N., Tolmacheva, Z.I., and Velikanova, T.Ya.

TITLE: On the structure of titanium carbide alloys with nickel, chromium, and molybdenum

SOURCE: Akademiya nauk SSSR.. Institut metallurgii, Issledovaniya po zharoprochnym splavam. v.8. 1962. 95-102

TEXT: The systems Ti-C-Ni, Ti-C-Cr, and Ti-C-Mo were studied in an attempt to determine the true phase composition of cermets containing TiC with Ni, Cr, or Mo. The solubility of Ni in TiC at 1000-1280°C is 0.7% by wt.; TiC-Ni alloys containing over 0.7% Ni are composed of two phases, the microhardness of one of the phases being 3000 kg./sq.cm. The section TiC-Ni through the Ti-C-Ni system; as well as the TiC-Cr and TiC-Mo sections through the respective ternary systems, are quasibinary; the melting of alloys containing over 5% Ni starts at 1280-1300°C. In the system Ti-C-Cr, the formation of a new phase, Cr₂₃C₆, is observed when small amounts of TiC are added to Cr; the TiC-Cr alloy containing 20% Cr is composed of

Card 1/2

S/659/62/008/000/014/028
I048/I248

On the structure of titanium...

three phases whose microhardness (300, 1000, and 3000 kg.sq.cm.) corresponds to that of solid solutions based on Cr, chromium carbide, and TiC respectively. TiC-Cr alloys containing 52.85 and 63.0% Cr are composed of two phases - Cr-based and TiC-based solid solutions. All alloys in the system Ti-C-Mo are composed of two phases, with microhardnesses of 300 and 2400 kg./sq.cm.; x-ray data reveals that these are Mo-based and TiC-based solid solutions. The experimental data for this system disagrees with the data of Albert and Norton (Planseeberichte fur Pulvermetallurgie, 4, 2, 1956), according to which a Mo₂C-based solid solution exists in the system. There are 7 figures and 1 table.

Card 2/2

43064
S/073/62/028/004/001/004
1017/1217

11.3900

AUTHOR: V.H. Yoremko

TITLE: Surface tension of liquid metals

PERIODICAL: Ukrainskiy khimicheskii zhurnal, v.28, no.4, 1962,
427-440

TEXT: A wide critical survey of the known data is made based on 76 references that are critically reviewed from point of view of the purity of the method employed. The surface tension of 63 elements are tabulated. A series of figures show graphically the dependence of the surface tension of metals at their melting temperature (1) on the work of release of the electrons; (2) on the inverse atomic volume, (3) on the atomic heat of melting, (4) on the atomic heat of sublimation, (5) on the atomic volume and melting temperature, (6) on the modality of displacement and density and (7-8) the surface tension of the liquid metals of the II, III, IV, V, VI and VII groups of the periodic system.

It is shown that there is no justification to suppose a proportion-

Card 1/2

S/073/62/028/004/001/004
I017/1217

Surface tension of...

ality between the surface tension of liquid metals and: (1) the ratio φ/r^2 (φ = work of release of the electrons, r^2 = square of the atomic radii), (2) the inverse value of the atomic volume, $\frac{1}{V}$, and (3) ΔH_m the molecular heat of melting. The proportionality between the molar free surface energy of liquid metals at melting temperature and the heat of sublimation and melting is justified. The known and experimentally obtained values for the surface tension of metals confirm the applicability of the periodical law on the surface properties of the metals. The most probable values for the surface tension of liquid metals, including the rare earths, are estimated and summarized on the basis of the law of periodical change of the surface tension of the elements and certain empirically found relations. There are 8 figures and 3 tables.

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

SUBMITTED: February 28, 1961
Card 2/2

YEREMENKO, V.N.; LUKASHENKO, G.M.

Thermodynamic properties of liquid solutions in the magnesium -
aluminum system. Ukr.khim.zhur. 28 no.4:462-466 '62.

(MIRA 15:8)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR.
(Magnesium-aluminum alloys)

5/073/62/028/004/004/004
I017/I217

AUTHORS: Yeremenko, V.N., Nizhenko, V.I., Levi, N.I., and
Bogatyrenko, B.B.

TITLE: Surface tension of liquid alloys of binary metallic systems having maximum on the liquidus curve

PERIODICAL: Ukrainskiy khimicheskiy zhurnal, v.28, no.4, 1962, 500-505

TEXT: The surface tension and the density of liquid alloys of nickel with aluminum at 1540°C and nickel with beryllium at 1500°C were determined. It was found that the formation of the alloys in the studied systems, is accompanied by chemical interaction which causes decreasing of volume and negative deviation of the isotherm of the specific volumes from the additive values.

The analogy between the type of diagrams: surface tension/composition and the diagram of state is stated. The compound NiBe is inactive toward both the components of the system. The compound NiAl

Card 1/2

S/073/62/028/004/004/004
I017/I217

Surface tension of liquid alloys...

is surface active toward nickel and inactive toward aluminium. Results show that, melting alloys conserve, in a large degree, the molecular groups corresponding to the composition of the intermetallic phases existing in the solid alloys. There are 4 figures and 1 table.

ASSOCIATION: Institut metallokeramiki y spetsialnikh splavov AN
USSR (Institute of Powder Metallurgy and Special
Alloys AS Ukr SSR) ✓
SUBMITTED: March 2, 1961

Card 2/2

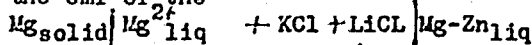
S/073/62/028/0005/002/005
I003/I203

AUTHORS: Yeremenko, V.N., and Lukashenko, G.M.

TITLE: Thermodynamic properties of magnesium-zinc liquid solutions

PERIODICAL: Ukrainskiy khimicheskii zhurnal, v.28, no.5, 570-574

TEXT: The thermal properties of the liquid magnesium-zinc system have been little investigated despite the fact that this system is very interesting both as the basis for many commercial alloys and as a system with strongly reactive components. In order to define the thermodynamic properties of liquid Mg-Zn alloys the emf of the



concentration cell was measured for 12 Mg-Zn alloys containing from 10 to 90 at% of Mg. The conclusion is reached that the behaviour of Mg-Zn liquid alloys shows considerable deviation from that of perfect solutions. This is due to the strong reactions between magnesium and zinc which give rise to a short-range order in the liquid Mg-Zn systems. There are 4 figures and 1 table. ✓

Card 1/2

Thermodynamic properties...

S/073/62/028/0005/002/005
1003/1203

ASSOCIATION: Institut metallokeramiki i spets. splavov AN USSR (Institute of
Powder Metallurgy and Special Alloys, AS UkrSSR)

SUBMITTED: April 29, 1961

Card 2/2

35406

S/076/62/036/003/004/011
B101/B108

18.1220

11.4300

AUTHORS:

Fesenko, V. V., Vasiliu, M. I., and Yeremenko, V. N. (Kiyev)

TITLE:

Study of the surface tension of liquid metal solutions. III.
Surface tension of cobalt-copper alloys

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 3, 1962, 518 - 520

TEXT: The surface tension of Cu, Co, and their alloys was determined at 1550°C by means of the gas bubble maximum pressure method. The impurity content in the metals was not more than 0.01%. The alloys were molten in Al₂O₃ crucibles in a vacuum or an H₂ atmosphere. The measurements were made with a beryllium oxide conical capillary (r = 0.247 cm) in H₂ or He. X

Assuming that the solutions in the system Co-Cu are regular above the melting point the Co, the activity α of the Co in solution in Cu was calculated from the equilibrium diagram: $\log \alpha = -(T_0 - T)L/4.576TT_0 + T_s \log N/T + (T - T_s) \log N/T$, where T_0 is the melting point of the pure solvent, L its heat of fusion at T_0 , N' the atom percentage at the solidus temperature T_s ,
Card 1/3

S/076/62/036/003/004/011
E101/B108

Study of the surface ...

N the atom percentage at the liquidus temperature T_s . The activity of Cu was calculated from the Gibbs-Duhem equation. The values of the surface tension rounded to 5 erg/cm² are:

a_{Co} (atom-%)	σ (erg/cm ²)
100.0	1,845
96.5	1,775
89.5	1,600
83.0	1,440
76.8	1,430
49.0	1,325
32.0	1,320
0	1,265

These values are in good agreement with those calculated from the equations of A. A. Zhukhovitskiy (Zh. fiz. khimii, 18, 214, 1944): $\sigma = \sigma_{Co} + n_o RT \ln(a_{Co}/a_{Co}^0)$; $b_{Co}/a_{Cu}^0 = (a_{Co}/a_{Cu}^0) \cdot \exp [(\sigma_{Cu} - \sigma_{Co})/n_o RT]$, where σ is the

Card 2/3

Study of the surface ...

S/076/62/036/003/004/011
B101/B108

surface tension of the alloy, b_{Co} and b_{Cu} the activities of Co and Cu in the surface layer, a_{Co} and a_{Cu} the activities inside the solution, σ_{Co} and σ_{Cu} the surface tensions of the pure metals, n_0 the number of moles of the pure component per unit surface area, δ the displacement coefficient equal to the ratio of the atomic volumes of Cu and Co. Consequently, measurements of the surface tension of alloys can be used as a criterion in the determination of the thermodynamic properties of liquid alloys. There are 2 figures, 1 table, and 9 references: 5 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: Metals Handbook, 1948 ed.; P. Kazakevich, G. Urbain, J. Iron and Steel Inst., 186, 167, 1957; B. C. Allen, W. D. Kingery, Trans. Metallurg. Soc. AIME, 30, 215, 1959.

ASSOCIATION: Akademiya nauk USSR, Institut metallokeramiki i spetsial'nykh splavov (Academy of Sciences UkrSSR, Institute of Powder Metallurgy and Special Alloys)

SUBMITTED: May 29, 1960

Card 3/3

11900

1.1600

5/22/02/000/004/010/012
1003/1203

AUTHOR: Yorozenko, V.N., Naidich, Yu.V., Lavrinenko, I.A.

TITLE: Investigation of the compression process during sintering in the presence of a liquid phase

PERIODICAL: Poroshkovaya Metallurgia, no.4, 1962, 72-89

TEXT: The sintering of metal powders in the presence of a liquid phase has so far been little investigated. The kinetics of such processes may considerably differ from those which take place during the sintering of solid metal powders. Three different mechanisms of sintering in the presence of a liquid phase are considered: The kinetics of sintering W-Cu and TiC-Ni powders under the above conditions were investigated by means of a dilatometric device. The density of the W-Cu metal powder increases sharply with the temperature of sintering and reaches a maximum value at 1300° - 1350°C. This increase in density is probably due to the increase in wetting of the tungsten by copper. A complete compression in the TiC-Ni metal powder is achieved when the content of the liquid phase is not less than 20-25 vol%. There are 12 figures and 2 tables.

Card 1/2

3/228/62/000/004/010/012
1003/1203

Investigation of the compression...

ASSOCIATION: Institut metallokeramiki i special'nykh splavov AN USSR (The Institute
of Metal Powders and Special Alloys of the AS UkrSSR)

SUBMITTED: February 17, 1962

L 27503-66 EWP(m)/T/EWP(t)/ETI IJP(c) JD/JG/Q8

ACC NR: AT6012365

SOURCE CODE: UR/0000/65/000/000/0025/0029

AUTHORS: Yeremenko, V. N.; Shtepa, T. D.; Gritsenko, E. Ye.

54
Bx1

ORG: none

TITLE: Intermediate phases in alloys of titanium with iridium and rhodium 27

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 25-29

TOPIC TAGS: titanium, iridium, rhodium, alloy phase diagram , cryetal lattice

ABSTRACT: The phase diagrams of the binary systems Ti--Ir, over the whole concentration region, and Ti--Rh from 40--100 at. % Rh were determined (see Figs. 1 and 2). The diagrams were constructed on the basis of microstructural and x-ray analysis data. Photographs of alloy polished sections are presented. It was found that the system Ti--Ir exhibits three intermediate phases: γ , δ , and ϵ . The crystal lattice of each intermediate phase was determined. The system Ti--Rh exhibits two intermediate phases: ϵ and δ . The latter phase, at an Rh content of 57 to 60 at.%, suffers a rearrangement, the nature of which is not yet clear and which requires

Card 1/2

L 27503-66
 ACC NR: AT6012365

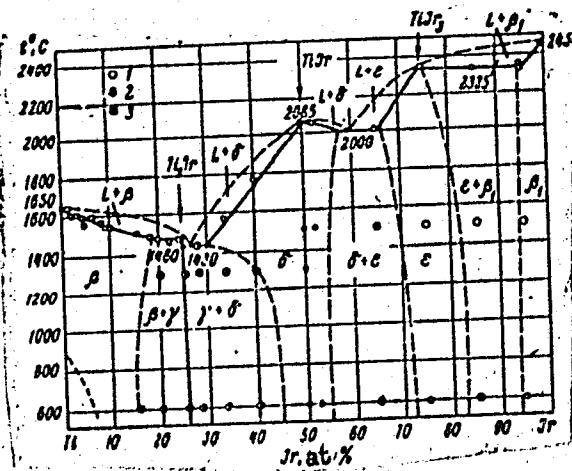


Fig. 1. Preliminary phase diagram of the system Ti--Ir. 1 - single-phase alloys; 2 - two-phase alloys; 3 - alloys which undergo a transformation in the solid state.

further study. Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: 02Dec65/ OTH REF: 002

Card 2/2 BLG

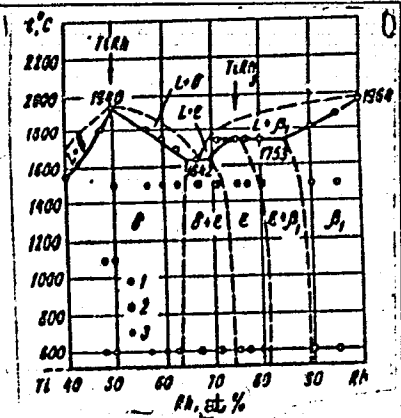


Fig. 2. Preliminary phase diagram of the system Ti--Rh. 1 - single-phase alloys; 2 - two-phase alloys; 3 - alloys which undergo a transformation in the solid state.

(A) (F) T/EWP(+)/ETI IJP(c) WH/GD/JG/JD
SOURCE CODE: UR/0000/65/000/000/000

ORG: Ieremenko, V. N.; Velikanova, T. Ya.
Institute of Material Science Problems, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Interaction between molybdenum and titanium carbide
AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 265-273

TOPIC TAGS: carbide, molybdenum compound, molybdenum, nonferrous metal, titanium, titanium compound

ABSTRACT: Interaction between molybdenum and titanium carbide in the 1.2-90 mol % TiC range was investigated by x-ray and metallographic techniques. Samples of Mo-TiC in various ratios were prepared by prolonged melting technique as well as by fusion in vacuum (10⁻⁴ mm Hg) of mixtures of TiC with Mo at 1850°-2000°C. The oxygen was removed in the samples by reduction with hydrogen at 1000°C. It was found that the Mo-TiC system is quasibinary and exhibits a eutectic type crystallization pattern. The eutectic temperature is 2175 ± 15°C. The solubility of Mo in TiC at the eutectic temperature is 37 mol % and at 2000°C it is 25 mol %. The solubility of TiC in Mo at the eu-

43
071

L 31873-66

ACC NR: AT6013564

itectic temperature is within the 3.5-4.5 mol % range and at 2000°C it falls within the 2-2.5 mol % range. The temperature dependence of the thermodynamic activity (a_c) of carbon in TiC and Mo₂C is shown in figure 1. A phase diagram of the quasibinary Mo-TiC system is also given. Orig. art. has: 6 figures, 1 table.

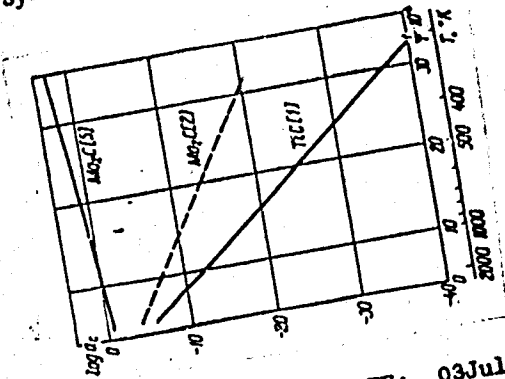


Fig. 1.

SUB CODE: 11,07/ SUBM DATE: 03Jul65/

ORIG REF: 003/

OTH REF: 003

Card 2/2 PB

30780-66 INT(m)/T/ESP(t)/ETI LJR(c) GS/CD-2/IG
ACC NR: AT6012363 SOURCE CODE: UR/0000/65/000/000/0011/0019

AUTHORS: Yoremko, V. N.; Velikanova, T. Ya.; Shabanova, S. V.

18
B+1

ORG: none

TITLE: Structure of certain alloys of the ternary system Ti--Mo--C

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 11-19

TOPIC TAGS: titanium, molybdenum, carbon, alloy phase diagram, hardness, lattice parameter

ABSTRACT: The phase relationships of the subsystems Mo₂C - TiC, and Mo₃C₂ - TiC of the system Ti--Mo--C were studied. The study was carried out by means of microstructural and x-ray analysis. The experimental results are summarized in graphs and tables (see Figs. 1 and 2). The lattice parameters and hardness of the phases occurring in the system were determined. Above 2000C, the higher carbide of molybdenum and titanium carbide form a continuous series of solid solutions.

Card 1/2

L 39780-66
ACC NR: AT6012363

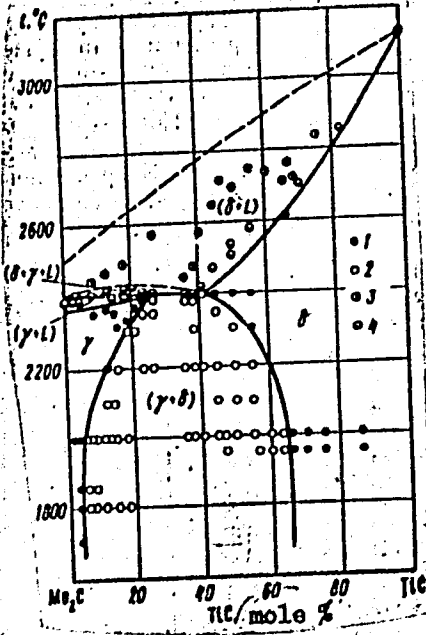


Fig. 1. Polythermic section $Mo_2C - TiC$.
1 - single-phase alloys γ or δ ; 2 - two-phase alloys $(\gamma + \delta)$; 3 - temperatures at which the specimens are in the solid-liquid state; 4 - temperature of solidus (obtained after the method of Al'tertum-Pirani).

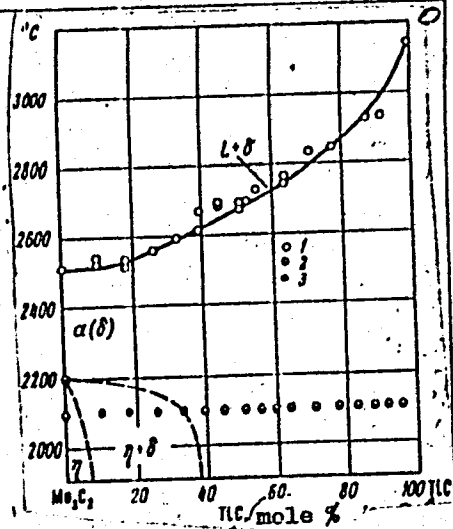


Fig. 2. Polythermic section $Mo_3C_2 - TiC$ (according to preliminary data). 1 - data of thermal analysis; 2 - single-phase alloys; 3 - two-phase alloys.

Orig. art. has: 5 tables and 10 figures.
SUB CODE: 11/ SUBM DATE: 02Dec65/
Card 2/2 mlp

ORIG REF: 003/ OTH REF: 005

I 30721-66 ENI(m)/T/ENP(G)/ETI 1. 1. 1. JD/W/GE-2
ACC NR: AT6012364 SOURCE CODE: UR/0000/65/000/000/0020/0024
15
B-1

AUTHORS: Yeremenko, V. N.; Listovnichiy, V. Ye.

ORG: none

TITLE: Phase diagram of the system Ti--P

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 20-24

TOPIC TAGS: titanium, phosphorus, alloy phase diagram, x ray spectroscopy, metal physical property

ABSTRACT: The phase diagram of the system Ti--P containing up to 45 at. % P was determined. The investigation was initiated to test the hypothetical phase diagram for this system proposed by R. Vogel and B. Giessen (Arch. Eisenhüttenwesen, 1959, 30, 565). The composition of the alloys was determined, after the method of O. Popova and O. Seraya (Analiz tugoplavkikh soyedineniy. Metallurgizdat, 1962, str. 226). On the basis of microstructural and x-ray analysis, a phase diagram for the system was constructed (see Fig. 1). The presence of the following phases was established: Ti_3P , Ti_2P , Ti_3P_2 , Ti_4P_3 , and TiP . The regions of homogeneity and several physical properties, e.g., density, crystal structure, melting point, microhardness, heat of formation, and specific electrical resistance of these phases

Card 1/2

39751-66
ACC NR: AT6012361

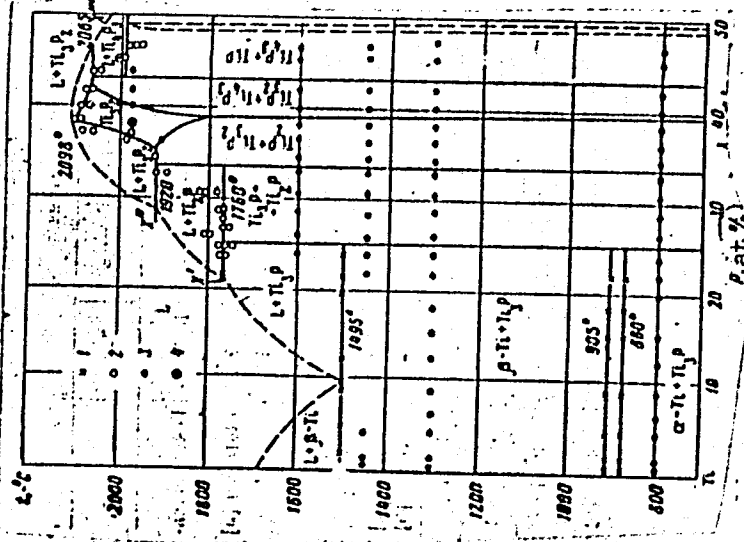


Fig. 1. Phase diagram of the system
 Tl-P. 1 - points correspond to -
 curves; 2 - temperature for the
 appearance of the liquid phase;
 3 - two-phase alloys; 4 - single-
 phase alloys.

were determined. The experimental results are tabulated. It is concluded that the proposed phase diagram of Vogel and Giesson is wrong. Orig. art. has: 1 table and 2 figures.

SUB CODE: 11/ SUBM DATE: 02Dec65/ ORIG REF: 003/ OTH REF: 010

Card 2/2 MLP

L 34084-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/WW/JW/HW/JG
ACC NR: AP6025520 SOURCE CODE: UR/0370/66/000/002/0188/0192

AUTHOR: Yeremenko, V. N. (Kiev); Nizhenko, V. I. (Kiev); Sklyarenko, L. I. (Kiev) 64
B

ORG: none

TITLE: Surface tension and density of molten alloys of the system Ni-Ga and their miscibility with Al sub 2 0 sub 3

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 188-192

TOPIC TAGS: surface tension, molten metal, nickel alloy, gallium alloy, aluminum oxide, alloy phase diagram, metal property, specific density, specific volume 16

ABSTRACT: This report shows that on the isotherm of free surface energy (σ) of molten alloys of the system Ni-Al there is a clearly pronounced point of inflection corresponding in composition to the congruently melting intermetallide NiAl. Gallium is an analog of aluminum and therefore it was of interest to study the surface properties of the Ni-Ga system and to compare them with the phase diagram.

The temperature and concentration relationships of the density of alloys in the Ni-Ga system were determined. It was established that specific volumes of alloys both in the molten and in the solid states differ sharply from additive values.

The temperature and concentration relationships of the free surface energy of molten alloys in the Ni-Ga system were studied. It was shown that the isotherm plotted from experimental data passes

UDG: 669.017.12

0916 0901

Card 1/2

L 34084-66

ACC NR: AP6025520

considerably above that calculated for an ideal solution. This evidences the negative departure of the system examined from ideality.

The isotherm of σ for the Ni-Ga system has a more flattened appearance compared to the isotherm of σ for alloys in the Ni-Al system, which is accounted for by the significant dissociation of intermetallics in the molten state in this system.

The temperature dependence of the regional corner of miscibility with alloys in the Ni-Ga system of polycrystalline specimens of aluminum oxide was studied. The presence of "thresholds of miscibility" on miscibility polytherms is accounted for by the intensified chemical reaction at the interface with increase in temperature. Orig. art. has: 6 figures, 4 formulas and 1 table. [JPRS: 36,774]

SUB CODE: 11, 20 / SUEM DATE: 11Nov64 / ORIG REF: 005 / OTH REF: 002

Card 2/2

L 43774-66 NT(m)/T/STP(t)/MTI IJP(c) JD/JA
ACC NR: AP6020063 (A) SOURCE CODE: UR/0226/66/000/006/0068/0072

34
B

AUTHOR: Yeremenko, V. N.; Shtepa, T. D.; Sirotenko, V. G.

ORG: Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya, AN USSR)

TITLE: Intermediate phases in alloys of titanium with iridium, rhodium, and osmium

SOURCE: Poroshkovaya metallurgiya, no. 6, 1966, 68-72

TOPIC TAGS: titanium alloy, rhodium alloy, osmium alloy, iridium alloy, ~~alloy~~ monoclinical structure, intermediate phase, PHASE COMPOSITION, ALLOY PHASE DIAGRAM

ABSTRACT: The authors investigated the alloys Ti-Ir, Ti-Rh, Ti-Os throughout the concentration range. The structures and some properties of the intermediate phases formed in these alloys were studied. The δ -phase was found for the first time in the Ti-Rh alloy, and it has been shown as a monoclinical structure with

Card 1/2

L 43774-66

ACC NR: AP6020963

the parameters $a=2,96\pm 0,03 \text{ \AA}$, $b=2,80\pm 0,03 \text{ \AA}$, $c=3,41\pm 0,02 \text{ \AA}$ and
 $\beta=90^{\circ}37'$. Orig. art. has: 2 tables. [Based on authors' abstract] [AM]

SUB CODE: 11/ SUBM DATE: 19Mar66/ ORIG REF: 002/ OTH REF: 007/

LS
Card 2/2

L 41349-66 EWT(a)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6020965 SOURCE CODE: UR/0226/66/000/006/0077/0087

35
A

AUTHOR: Yeremenko, V. N. ; Buyanov, Yu. I. ; Prirna, S. B.

ORG: Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN USSR)

TITLE: Structure of a phase diagram of a titanium-copper system

SOURCE: Poroshkovaya metallurgiya, no. 6, 1966, 77-87

TOPIC TAGS: titanium ^{compound} ~~copper system~~, phase diagram, ^{metal} ~~microdurometric~~ analysis, ^{copper compound}

ABSTRACT: Phase diagrams of a titanium-copper system have been studied by metallographic, x-ray and microdurometric analyses at concentrations of 20 to 100 at % Cu. The results obtained and the data in the literature have enabled the authors to construct a phase diagram of the Ti-Cu system. The system has six metalloides, of which Ti₂ Cu, Ti Cu, and Ti Cu₄ form phases of variable composition with narrow regions of homogeneity. Orig. art. has: 3 tables and 2 figures. [Based on authors' abstract] [AM]

SUB CODE: 11/ SUBM DATE: 19Mar66/ ORIG REF: 002/ OTH REF: 014/
Card 1/1 11t

L 43737-65 EWT(m)/T/EWP(t)/ETI IJP(c) JG/JD
ACC NR: AP6030766 (N) SOURCE CODE: UR/0363/66/002/009/1568/1573

3B

AUTHOR: Tret'yachenko, L. A.; Yeremenko, V. N.

ORG: Institute of Problems of Material Science, Academy of Sciences, UkrSSR
(Institut problem materialovedeniya Akademii nauk UkrSSR)

TITLE: Vanadium-carbon system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 9, 1966, 1568-1573

TOPIC TAGS: vanadium carbon system, vanadium carbon alloy, vanadium monocarbide, vanadium subcarbide, ALLOY SYSTEM, VANADIUM ALLOY, CARBON ALLOY, ALLOY PHASE, DIAGRAM.

ABSTRACT: A series of vanadium-carbon alloys containing up to 58 at% of carbon has been investigated. On the basis of obtained results a phase diagram of the vanadium carbon system was plotted (see Fig. 1). The solubility of carbon in vanadium is about 4 at% at 1650 and drops rapidly with decreasing temperature. The homogeneity region of V₂C carbide extends from 30 to 33.3 at% at 1650C and from 31.5 to 33.3 at% at 1450C. The homogeneity region of VC carbide extends from 39 to 47.5 at% at 2100C and from 42.5 to 47.5 at% at 1450C. In alloys with 37-41 at% C, a ξ -phase was observed, the nature and structure of which was not determined. In the x-ray diffraction pat-

Card 1/2

UDC: 546.881+546.26

L 43737-66

ACC NR: AP6030766

0

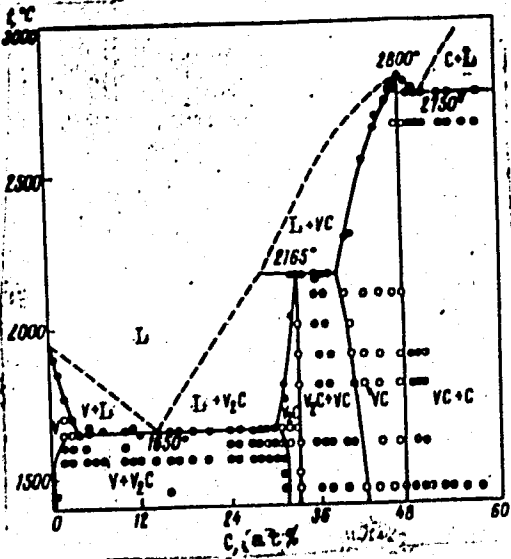


Fig. 1. Phase diagram of the vanadium-carbon system. (L - designated liquid).

terms of alloys containing more carbon than VC_{0.90}, some additional lines were found, the nature of which also was not determined. Orig. art. has: 4 figures. [TD]
 SUB CODE: 07, 11, 20/ SUBM DATE: 23Nov65/ ORIG REF: 012/ OTH REF: 015/ ATD PRESS: 5076
 Card 2/2 hs

L 46004-66 EWT(m)/EWP :)/ETI/EWP(k)

IJP(c) JD/JG/JT

ACC NR: AP6025943

SOURCE CODE: UR/0226/66/000/007/0084/0088

55
52
B

AUTHOR: Tret'yachenko, L. A.; Yeremenko, V. N.

ORG: Institute of Problems in the Science of Materials, AN UkrSSR (Instytut problem materialovedeniya AN UkrSSR)

TITLE: Structure and properties of alloys with respect to the ²¹TiC-VC_{0.90}, ²¹TiC-V₂C and TiC-V sections and in the TiC-VC_{0.90} region of the Ti-V-C ternary system

SOURCE: Poroshkovaya metallurgiya, no. 7, 1966, 84-88

TOPIC TAGS: vanadium¹ containing alloy, titanium containing alloy, carbide, arc furnace, stoichiometric mixture, microhardening, metallographic examination, x ray diffraction analysis, TERNARY ALLOY

ABSTRACT: The alloys for the study were melted in an arc furnace, with a tungsten electrode and a water-cooled cooper hearth, in a 400-500 mm Hg argon atmosphere. The argon was purified by melting a titanium getter,⁴ Carbothermic vanadium (99.7% V, 0.23% C), titanium iodide and spectrally pure graphite were used as starting materials. Titanium carbide with a stoichiometric composition and vanadium carbide containing approximately 40 at.% C were premelted and used for preparing the charge. The alloy ingots produced in the arc furnace were cut on an electroerosion machine tool. These were annealed at various temperatures to a uniform composition

Card 1/2

L 46004-66

ACC NR: AP6025943

in vacuum or in an inert atmosphere at low temperatures in ^{7/4}TGV-1 or ⁶MVP-3 M type ³ovens in molybdenum heater containers and quickly cooled. The alloys were studied by metallographic and x-ray diffraction analysis using the powder method on the URS-70 unit in the RKD camera with copper K_{α} -radiation. The Pirani-Alertum method was used for measuring microhardness and determining the initial melting point. All alloys which contained more than 30 at.% C were chemically analyzed. The melting point and microhardness of titanium carbide solid solutions and carbon-saturated vanadium monocarbide were determined. The composition of these corresponds to the TiC-VC_{0.90} section. It is found that the temperature of the eutectic formed by TiC-VC_{0.90} solid solutions with graphite decreases from 2950 to 2750°C with an increase in VC_{0.90} from zero to 100 mol.%. The TiC-V₂C and TiC-V polythermic sections of the Ti-V-C system are plotted and the lattice constants and phase microhardness are determined for these alloys with respect to these sections. Neither of these sections is quasibinary. Orig. art. has: 5 figures, 3 tables.

SUB CODE: 11/ SUBM DATE: 15Apr66/ ORIG REF: 004/ OTH REF: 005

Card 2/2 mjs

ACC NR: AR6035408

SOURCE CODE: UR/0137/66/000/009/A007/A007

AUTHOR: Yeremenko, V. N.; Nizhenko, V. I.; Sklyarenko, L. I.

TITLE: Surface properties of chrome-nickel alloys

SOURCE: Ref. zh. Metallurgiya, Abs. 9A44

REF. SOURCE: Sb. Poverkhnost. yavleniya v rasplavakh i voznykayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 297-301

TOPIC TAGS: surface property, surface tension, nichrome alloy, temperature dependence, molten metal

ABSTRACT: The surface tension σ and the density of nichrome alloys were investigated by the large-drop method in a helium atmosphere as a function of the temperature and concentration. The chromium reduces the σ of liquid Ni, especially when the chromium content exceeds 10 at.%. A minimum is observed on the isotherm of σ at concentrations near 50 at.% Cr. A study was made of the temperature and time dependence of the contact angle when Al_2O_3 is wetted by molten nickel or Cr-Ni. The best adhesion characteristics in the Cr-Ni melt + Al_2O_3 system is possessed by nichromes containing up to 30 at.% chromium; with further increase of the chromium content, the temperature at which the contact angle becomes minimal increases. Therefore nichromes containing up

UDC: 669.24'26-154:532.61

Card 1/2

ACC NR: AR6035408

to 30 at.% of chromium are the most suitable binders in cermets of the Me-Al₂O₃ type up to 1550°. 5 illustrations. Bibliography, 9 titles. A. Granovskaya. [Translation of abstract]

SUB CODE: 20, 11

Card 2/2

L 10345-67 EWT(m)/EWT(t)/ETI IJ(C) UP
ACC NR: AP6031593 (A) SOURCE CODE: UR/0226/66/000/008/0033/003/ 24

AUTHOR: Tret'yachenko, L. A.; Yeremenko, V. N.

ORG: Institute of Problems in Material Science, Academy of Sciences, UkrSSR (Institut problem materialovedeniya, AN UkrSSR)

TITLE: Structure of some alloys of the titanium-vanadium-carbon system

SOURCE: Poroshkovaya metallurgiya, no. 8, 1966, 33-38

TOPIC TAGS: titanium base alloy, vanadium containing alloy, system polythermal section, Alloy phase diagram, carbon containing alloy, titanium vanadium carbon system

ABSTRACT: A series of titanium-vanadium-carbon alloys with a constant vanadium content of 66.7 or 84 at% and alloys with a composition located along the Ti-VC and Ti-V₂C sections of the composition triangle have been investigated and the respective polythermal sections of the ternary diagram have been plotted on the basis of data obtained by physicochemical analysis. It was found that for Ti-VC, the solubility of vanadium carbide in β-titanium was less than 1 mol% at temperatures up to 1500C and about 4 mol% at 1600C. The maximum microhardness of the metallic phase was at about 25% mol%VC. For Ti-V₂C, the limit of solubility of V₂C in β-titanium was about 3 mol% at 1600C; the limit of solubility of titanium in V₂C reached about 13 mol%. The microhardness of the V₂C-base phase decreases from

Card 1/2

L 10315-67

ACC NR: AP6031593

2050 dan/mm² for pure V₂C to 1250 dan/mm² at 13% titanium. Orig. art. has:
7 figures and 1 table.

[TD]

SUB CODE: 11/ SUBM DATE: 15Apr66/ ORIG REF: 003/

Card 2/2 mla

ACC NR: AP6034198

SOURCE CODE: UR/0369/66/002/005/0574/0577

AUTHOR: Yeremenko, V. N.; Natanzon, Ya. V.

ORG: Institute of Materials Science Problems, AN UkrSSR, Kiev (Institut problem materialovedeniya AN UkrSSR)

TITLE: Determination of the kinetics of dissolution of materials in liquid metals

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 5, 1966, 574-577

TOPIC TAGS: metal melting, metal physical property, solid dynamics, solid mechanics, solid mechanical property, physical diffusion

ABSTRACT: A schematic of the apparatus and the testing procedure is given for determining the kinetics of dissolution of the solid materials immersed in molten metals. Among the basic features of the method are: operation at $1-2 \cdot 10^{-5}$ mm Hg, continuous agitation of the metal, and a provision for continuous sample taking. The maximum operation temperature of the apparatus is 1500-1700°C. As an example, a kinetic curve is given for dissolution of copper in molten lead at 485°C. Orig. art. has: 1 formula, 2 figures.

SUB CODE: 07,11/

SUBM DATE: 19Apr66/

ORIG REF: 007/

OTH REF: 011

Card 1/1

ACC NR: AR7000858

SOURCE CODE: UR/0058/66/000/009/E011/E011

AUTHOR: Yeremenko, V. N.; Nizhenko, V. N.; Sklyarenko, L. I.

TITLE: Temperature dependence of the free surface energy of molten iron

SOURCE: Ref. zh. Fizika, Abs. 9E92

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 287-292

TOPIC TAGS: temperature dependence, molten metal, carbonyl iron, free surface energy, surface energy

ABSTRACT: The surface tension (σ) of molten iron in the 1540--1750C temperature range is measured by the lying-drop method. The object of the investigation was carbonyl iron, annealed in hydrogen at 1000--1200C and remelted in a 10^{-4} mm Hg vacuum. Consideration of all possible measurement errors leads to the expression

$$\sigma = 1856 \pm 2.3 - 0.23 \pm 0.02 \cdot (t - 1534)$$

The thermodynamic characteristics of the molten iron surface are computed from the data of σ and $\frac{\partial \sigma}{\partial T}$. A. Vertman. [Translation of abstract] [NT]

SUB CODE: 20/

Card 1/1

ACC NR: AR7000857 SOURCE CODE: UR/0058/66/000/009/E011/E011

AUTHOR: Ivashchenko, Yu. N.; Yeremenko, V. N.; Bogatyrenko, B. B.;
Khilya, G. P.

TITLE: Temperature dependence of free surface energy of liquid magnesium

SOURCE: Ref. zh. Fizika, Abs. 9E91

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz
nikh tverd. fazakh. Nal'chik, 1965, 281-286

TOPIC TAGS: temperature dependence, free energy, liquid helium, ^{liquid metal,} surface
tension, magnesium/MG-1 magnesium

ABSTRACT: Measurements were made of the surface tension (σ) of MG-1
magnesium (99.91%-pure) by the lying-drop method in a purified helium medium.
The results fulfill the equation $\sigma_T = 588.4 \pm 1.2 - 0.182 \pm 0.001 (T - 650)$. The
critical temperature is evaluated as 3860 ± 100 C. A comparison is made of the
results of previous determinations and it is shown that the most probable value of
 σ at 700C is 580 mj/cm^2 . A. Vertman. [Translation of abstract] [NT]

SUB CODE: 20/

Card 1/1

YEREMENKO, V.N., otv. red.; FRANTSEVICH, I.N., red.; SAMSONOV, G.V., red.; PISARENKO, G.S., red.; FEDORCHENKO, I.M., red.; TRESVYATSKIY, S.G., red.; IVASHCHENKO, Yu.N., red.; POKROVSKAYA, Z.S., red.; RAKHLINA, N.P., tekhn. red.

[Surface phenomena in melts and in processes of powder metallurgy] Poverkhnostnye iavleniia v rasplavakh i protsessakh poroshkovoii metallurgii. Kiev, Izd-vo AN Ukr. SSR, 1963. 377 p. (MIRA 17:3)

1. Akademiya nauk URSS, Kiev. Instytut metalokeramiki i spetsial'nykh splaviv. 2. Institut metallokeramiki i spetsial'nykh splavov AN Ukr.SSR (for Yeremenko).

YEREMENKO, V.N., otv. red.; FRUNTSEVICH, I.N., red.; SAMSONOV,
G.V., red.; PISARENKO, O.S., red.; FEDORCHENKO, I.M.,
red.; TRESVYATSKIY, S.G., red.; IVASHCHENKO, Yu.N., red.;
POKROVSKAYA, Z.S., red.

[Surface phenomena in melts and processes of powder metal-
lurgy] Poverkhnostnye iavlenia v rasplavakh i protsessakh
poroshkovoi metallurgii. Kiev, Izd-vo AN USSR, 1963. 456 p.
(MIRA 18:1)

1. Akademiya nauk URSS, Kiev, Institut metallokeramiki i
spetsial'nykh splaviv. Institut metallokeramiki i spe-
tsial'nykh splavov AN Ukr.SSR (for Ivashchenko, Yeremenko)

solubility of Mo in TiC at the eutectic temperature is 37 Mol%. At 2000°C, the
solubility of TiC in Mo at the eutectic

Card 1/2

ACCESSION NR AF 3 17 116

NO REF COM: 003

OTHER: 001

Card 2/2

YEREMENKO, V.N. (Kiyev); NAYDICH, Yu.V. (Kiyev); VASILIU, M.I. (Kiyev)

Surface tension of melts in the system cobalt - tin. Izv.
AN SSSR. Met. i gor. delo no.5:64-67 S-0 '63. (MIRA 16:11)

YEREMENKO, V.N.; NIZHENKO, V.I.

Role of surface phenomena in powder metallurgy processes. Porosh.
met. 3 no.4:17-28 J1-Ag '63. (MIRA 16:10)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.
(Powder metallurgy) (Surface chemistry)

S/078/63/008/001/001/026
B119/B186AUTHORS: Yeremenko, V. N., Lukashenko, G. M.

TITLE: Thermodynamic properties of higher zinc antimonide

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 1, 1963, 8 - 10

TEXT: The electromotive force (e.m.f.) and the temperature coefficient of the e.m.f. were measured for galvanic chains according to the scheme $Zn_{liq} | KCl - NaCl - ZnCl_2 | [ZnSb + Sb]_{solid}$. The results were used to calculate the free energy of formation, the entropy, and the heat of formation when ZnSb is formed from the elements. The measurements were made with Zn-Sb alloys containing 15, 20, 25, 30, 37, and 43 % by weight of Zn at 420 - 500°C. The measured values corresponded to the equation e.m.f. = $0.0795 - (t - 450) \cdot 0.66 \cdot 10^{-4}$ volts with an accuracy of ± 0.5 mv. The free energy of formation for the production of solid ZnSb from liquid Zn and solid Sb, $\Delta Z = -3670 + 3.04 (t - 450)$ cal/mole. The entropy of formation $\Delta S = -3.04$ cal/mole·deg. The heat of formation ΔH at 450°C = -5870 cal/mole. For the formation of solid ZnSb from solid Zn and Sb, $\Delta H_{ZnSb}^0 = -4130$ cal/mole

Card 1/2

Thermodynamic properties of...

S/078/63/008/001/001/026
B119/B186

-2065 cal/g-atom; $\Delta S_{\text{ZnSb}}^{\circ} = -0.53$ cal/mole.deg = -0.26 cal/g-atom.deg.

The standard quantities for the formation of ZnSb at 298°K could not be determined since neither the heat capacity of the compound nor the heat of phase transformation at 300°C are known. There are 2 figures. The most important English-language references are: G. Silvey, V. Lyonns, V. Silvestry. J. Electrochem. Soc., 108, 658. (1961); O. Kubaschewski, J. Catterall. Thermochemical data of Alloys, Pergamon Press, 1956; H. Seltz, B. Dewitt. J. Amer. Chem. Soc., 61, 2594 (1939).

ASSOCIATION: Institut metallokeramiki i spetsplavov Akademii nauk USSR
(Institute of Powder Metallurgy and Special Alloys of the
Academy of Sciences UkrSSR)

SUBMITTED: March 28, 1962

Card 2/2

YEREMENKO, V.N.; NIZHENKO, V.I.

Surface properties of Ni-Au-Al₂O₃ liquid alloys. Zhur.n_oorg.khim.
8 no.9:2124-2127 S '63. (MIRA 16:10)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

YEREMENKO, V. N.

S/0089/63/015/003/0266/0267

ACCESSION NR: AP3008085

AUTHOR: none

TITLE: Seminar on refractory metals, compounds, and alloys [Kiev, April 1963]

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

TOPIC TAGS: refractory metal, refractory compound, refractory alloy, electron structure, crystal structure, electron beam welding, physical property, vanadium, niobium, molybdenum, single crystal growth, tungsten, rhenium silicide, nonmagnetic zirconium base alloy, tantalum, nonmetallic element diffusion, heat conductivity, electric conductivity, thermal diffusivity

ABSTRACT: In April 1963, a seminar on the extraction, physical properties, and electron structure of refractory metals was held in Kiev under the sponsorship of the Institute of Powder Metallurgy and Special Alloys, Academy of Sciences, Ukrainian SSR. Approximately 300 representatives of scientific research institutes attended the

Card 1/11

ACCESSION NR: AP3008085

seminar. One hundred papers were presented. Among them were the following:

I. I. Kornilov. The interaction between refractory compounds involving the formation of binary, ternary, and multicomponent solid solutions.

G. V. Samsonov. Classification of hydrides, nitrides, and other compounds of nonmetals with elements of the periodic table.

V. N. Yeremenko, Z. I. Tolmachev. The relationship between some properties and the electron structure of transition metals and their interstitial phases.

G. V. Samsonov. The nature of the catalytic properties of transition metals.

I. A. Kedrinskiy, A. I. Avgustinnik, Ye. A. Berkman. Experimental data on the catalytic activity of refractory metal electrodes in electrochemical reactions.

Card 2/4

YEREMENKO, V.N.; LUKASHENKO, G.M.

Thermodynamic properties of liquid solutions of the magnesium -
cadmium system. Ukr. khim. zhur. 29 no.10:1048-1052 '63.
(MIRA 17:1)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

YEREMENKO, V.N.; NIZHENKO, V.I.

Surface properties of nickel-based liquid alloys. Part 1. Effect of silver on the surface tension of nickel. Ukr. khim. zhur. 29 no.11:1157-1160 '63. (MIRA 16:12)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

ACCESSION NR: AT4030795

S/0000/63/000/000/0097/0109

AUTHOR: Yeremenko, V. N.; Nizhenko, V. I.

TITLE: Surface properties of nickel based alloys

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'nykh splavov. Poverkhnostnyye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 97-109

TOPIC TAGS: surface property, nickel based alloy, powder metallurgy, infusible surface, nickel, aluminum oxide, surface tension, binary alloy, copper containing alloy

ABSTRACT: The results of the investigation were compared with diagrams of conditions for the same systems. The authors concluded that the isotherm of surface tension for alloys in a system with inorganic solubility in the solid, as well as the liquid state, was given by Zhukhovitskiy's equation (A. A. Zhukhovitskiy, ZhFKh, vol. 18, 1944, p. 214) for an ideal solution (nickel-copper). In the binary liquid systems examined, the component with the least surface tension had an active surface relative to the second component. The lowering of the surface tension in these systems practically ceased in a composition which corresponded to the monotectic point
Card 1/2

ACCESSION NR: AT4030795

coordinate (nickel-silver). Surface tension in a nickel-chromium system was studied and the isotherm of the surface tension showed a very slight deviation of the surface tension in alloys from the additive values. It was established that in systems with maxima on the fusibility curves corresponding to the congruently melting electron compounds having an electron concentration of 3:2, extreme points in the form of a maximum (nickel-beryllium) or a point of bend (nickel-aluminum) were detected on the isotherms of surface tension. In the nickel-tin system, such points were not detected although the isotherm in the region of the composition of the electron compound Ni_3Sn having an electron concentration of 1.75 had an abnormal path. Orig. art. has: 12 figures.

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

SUBMITTED: 23Nov63

DATE ACQ: 16Apr64

ENCL: 00

SUB CODE: ML

NO REF SOV: 018

OTHER: 008

Card 2/2

ACCESSION NR: AT4030797

S/0000/63/000/000/0119/0124

AUTHOR: Yeremenko, V.N.; Naydich, Yu.V.; Vasiliu, M.I.

TITLE: Surface tension and density of liquid alloys of the Co-Sn system

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'ny*kh splavov. Poverkhnos-
tny*ye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (surface phen-
omena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR,
1963, 119-124

TOPIC TAGS: surface tension, density, cobalt based alloy, tin containing alloy,
aluminum oxide, high temperature

ABSTRACT: The authors developed a method of determining the density of liquid metals
at high temperatures. This work was done in an aluminum oxide crucible heated to a
maximum temperature of 1900^o. The results were presented in graphs and compared with
published data. The accuracy of the density method was 0.3%. Density of liquid
alloys in the Co-Sn system was determined at a temperature of 1550^oC. The surface
tension of the Co-Sn alloy system was measured. The isotherm of the surface tension
of the Co-Sn system at 550^oC had a continuous path. Orig. art. has: 4 figures, 2

Card 1/2

ACCESSION NR: AT4030797

tables, and 2 formulas.

ASSOCIATION: Institut metallokeramiki i spetsial'ny*kh splavov AN UkrSSR (Institute of Powder Metallurgy and Special Alloys of the AN UkrSSR)

SUBMITTED: 23Nov63

DATE ACQ: 16Apr64

ENCL: 00

SUB CODE: ML

NO REF SOV: 007

OTHER: 004

Card 2/2

S/0000/63/000/000/0172/0181

ACCESSION NR: AT4030803

AUTHOR: Naydich, Yu. V.; Lavrinenko, I. A.; Yeremenko, V. N.

TITLE: The study of the effect of capillary phenomena on the packing process during sintering in the presence of the liquid phase

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'nykh splavov. Poverkhnostnyye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 172-181

TOPIC TAGS: capillary phenomenon, packing process, sintering, liquid phase, metal powder, tungsten, copper, silver, tungsten based alloy, copper containing alloy, silver containing alloy, wetting

ABSTRACT: The authors studied the subject effect in systems where the solid phase is insoluble in the liquid phase. The effect of the degree of wetting and the amount of the liquid phase on the packing process during sintering, in the presence of a liquid phase in tungsten-copper and tungsten-silver systems, was studied. The rise of shrinkage with temperature increase was detected for which the probable cause was the increase in the degree of wetting. It was shown that a change of the

Card 1/2

ACCESSION NR: AT4030803

contact angle of wetting led to a sharp change of capillary pressure, in connection with which greater packing should be observed. The effect of the amount of liquid phase on the packing process was studied. It was shown that shrinkage with a rise in the amount of the liquid phase increases at first, passes a maximum, and then falls. Such a change in shrinkage is located in accordance with a similar course of the curve of capillary wetting force which is active during sintering. The maximum packing was observed at 50-60% of the filled pores. At this time the greatest capillary forces between particles were observed. Capillary phenomena play a large role during sintering in the presence of a liquid phase of the metal systems and require further detailed study. Orig. art. has: 12 figures.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute of Metal Ceramics and Special Alloys, AN UkrSSR) ✓

SUBMITTED: 23Nov63

DATE ACQ: 16Apr64

ENCL: 00

SUB CODE: ML, PH

NO REF SOV: 004

OTHER: 004

Card 2/2

YEREMENKO, V.N.; IJKASHENKO, G.M.

Thermodynamic parameters of melts of the system magnesium-tin.
Ukr.khim.zhur. 29 no.9:896-900 '63. (MIRA 17:4)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

ACCESSION NR: AP4015260

S/0228/64/000/001/0005/0011

AUTHOR: Naydich, Yu. V.; Lavrinenko, I. A.; Yeremenko, V. N.

TITLE: The role of capillary phenomena in the process of densification during sintering in the presence of a liquid phase

SOURCE: Poroshkovaya metallurgiya, no. 1, 1964, 5-11

TOPIC TAGS: sintering, liquid phase sintering, compact sintering, compact shrinkage, liquid phase effect, capillary effect

ABSTRACT: The study centered on the first stage of densification (i. e., during liquid flow or the regrouping of solid particles for the W-Cu and W-Ag systems, whose solid phases are not soluble in the liquid phases. The materials used were of technical purity; particle diameter was less than 0.040 m. Shrinkage was found to increase with temperature, probably due to a better wetting of the solid phase. The expression

$$P = \sigma \left[\pi R^2 \sin^2 \varphi \left(\frac{1}{\rho_s} - \frac{1}{\rho_l} \right) + 2\pi R \cdot \sin \varphi \cdot \sin(\varphi + \theta) \right], \quad (1)$$

Card 1/3

ACCESSION NR: AP4015260

was derived for the compressive force for the case of two spherical particles with liquid meniscus between them (see Fig. 1 in the Enclosure), in relation to the contact angle of wetting. Here, ζ_1 and ζ_2 are curvature radii (see Fig. 1), ϕ is an angle governed by the volume of liquid, σ is the surface tension at the liquid-gas boundary, θ is the contact wetting angle. Variation in the latter results in a sharp change of capillary pressure. Greater shrinkage should result when wetting is more extensive. Shrinkage increases with an increase in volume of liquid phase, peaks when pores are filled to 50 to 60%, then decreases. It is concluded that capillary phenomena are of substantial significance in the sintering process. Orig. art. has: 9 figures and 1 formula.

ASSOCIATION: Institut problem materialovedeniya AN UkrSSR (Institute for the Problems of Materials Improvement, AN UkrSSR)

SUBMITTED: 13Jan63

ATD PRESS: 3071

ENCL: 01

SUB CODE: MM

NO REF SOV: 005

OTHER: 004

Card

2/3

ACCESSION NR: AP4015260

ENCLOSURE: 01

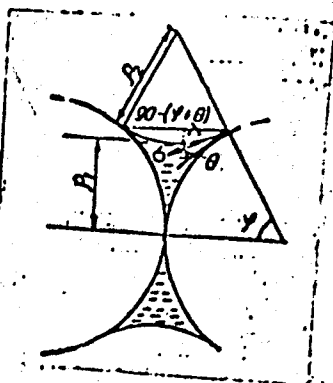


Fig. 1. Dependence of compacting force for two spherical particles with liquid menisci on the marginal angle of particle surface.

Card 3/3

ACCESSION NR: AP4029201

S/0226/64/000/002/0011/0018

AUTHOR: Nizhenko, V. I.; Yeremenko, V. N.

TITLE: On the surface active additions in liquid metals

SOURCE: Poroshkovaya metallurgiya, no. 2, 1964, 11-18

TOPIC TAGS: liquid metal, addition, surface activity, sublimation, melting temperature

ABSTRACT: In this paper the authors discussed the criteria of surface activity. The differences in the specific heats of sublimation of the dissolved substance and solvent, as well as the differences of full potential barriers, are proposed as new criteria. They graphically present relationships between the specific heat of sublimation and the melting temperature of the metals, the specific heat of sublimation and the hardness of the metals, the total potential barrier and the free surface energy, the total potential barrier and the melting temperature, and the total potential barrier and hardness. Properties of the elements used for evaluating the reliability of the criteria of surface activity in the metal systems are presented in a table. This reliability was checked by experimental data of over 100 metal systems. The best criteria proved to be the difference between the free surface

Card 1/2

ACCESSION NR: AP4029201

energies, full potential barriers and specific heats of sublimation of the dissolved substance and the solvent. To verify the reliability of the criteria, it is necessary to obtain experimental data and ensure for the purity of the materials used. Orig. art. has: 1 table, 8 figures and 3 formulas.

ASSOCIATION: Institut problem materialovedeniya AN SSSR (Institute of Metal Behavior Problems, AN SSSR)

SUBMITTED: 16Aug63

DATE ACQ: 28Apr64

ENCL: 00

SUB CODE: ML

NO REF SOV: 015

OTHER: 004

Card 2/2

heat of formation, galvanic element

ABSTRACT

Card 1, 2

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720001-3

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720001-3"

Card 1/3

Card 2 3

YEREMENKO, V.II. (Kiyev); LUKASHENKO, G.M. (Kiyev); SIDORKO, V.P. (Kiyev)

Thermodynamic properties of solid solutions in the system copper-
manganese. Izv. AN SSSR. Met. i gor. delo no.6:151-155 N-D '64.
(MIRA 18:3)

SECRET

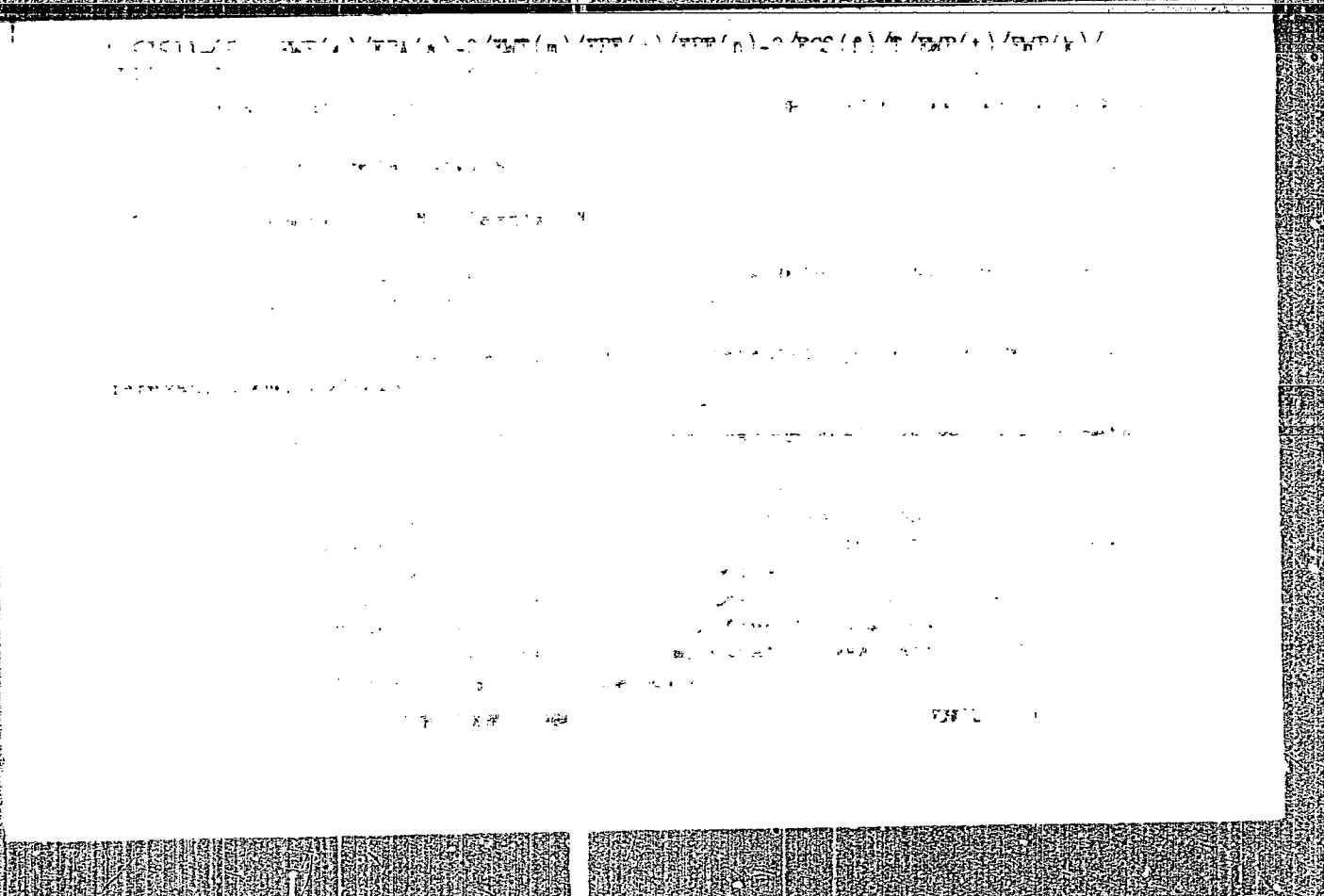
REF ID: A6570007005 0033/003

"APPROVED FOR RELEASE: 09/01/2001

CIA-RDP86-00513R001962720001-3

APPROVED FOR RELEASE: 09/01/2001

CIA-RDP86-00513R001962720001-3"



ACCESSION NR: AP4040771

S/0021/64/000/006/0763/0766

AUTHOR: Yeremenko, V. N.; Shtepa, T. D.; Churakov, M. M.

TITLE: Interaction of titanium with iridium

SOURCE: AN UkrRSR. Dopovidi, no. 6, 1964, 763-766

TOPIC TAGS: titanium-iridium system, titanium iridium alloy, alloy property, alloy structure, titanium indium compound

ABSTRACT: Methods of metallography, x-ray diffraction, and micro-hardness tests were used to investigate titanium-iridium alloys containing 1-55 at% iridium. Alloys were melted in an unconsumable electrode arc furnace in an argon atmosphere, then annealed at 1100C for 48 hr in evacuated quartz ampoules and furnace cooled. Three intermediate phases were found in the system. The phase appearing in the alloy with 15 at% iridium was designated the γ -phase; the alloy with 25 at% iridium consists of γ -phase only. According to the composition and structure, it is the Ti_3Ir compound; its micro-hardness is 780--850 kg/mm²; Alloys with high γ -phase content: are

Card: 1/2