BROJERSKI, R.

BROJERSKI, R. Developmental trends of production technique and management in the clothing industry. Pt. 3. Organizational and technical problems. p. 5. Vol. 7, no. 1, Jan. 1956. ODZIEZ. Lodz, Poland.

SOURCE: East European Accessions List (EEAL) LC Vol. 5, No. 6 June 1956

BROJEWSKI, Maksymilian

Assessment of rates for social insurance and calculation of insurance benefits for workers of private handicraft. Praca zabezp spol 3 no.8/9:93-98 '61.

BROJEWSKI, Maksymilian

Maternity insurance allowances during maternity vacations. Praca zabezp spol 3 no.12:53-56 '61.

BROJEWSKI, Maksymilian

Compensation and the right to a health-or-maternity insurance allowance. Praca zabezp spol 3 no.11:42-44 '61.

BROJEWSKI, ~~Maksymilian~~

Pay periods of sickness allowances. Praca i zabezp spol 4 no. 5:52-55. My '62

BROJEWSKI, Maksymilian

Forms of employment and social insurance of employees of the Agricultural Circles. Praca zabezp spol 5 no.3:57-61 Mr '63.

BROJEWSKI, Maksymilian

Types of wages constituting the bases for the calculation of benefits in cases of health and maternity insurance. Praca zabesp spol 5 no.8/9:89-92 Ag-S '63.

BROJEWSKI, Maksymilian

Method of computing sickness allowances. Praca zabezp spol 5 no.12:40-43 D'63.

BROJEWSKI, Maksymilian

New principles of supervising employees on sick leave ordered by a physician. Praca zabezp spol 6 no.3:32-35 Mr '64.

BROJEWSKI, Maksymilian

Subsidies because of contagious diseases. Praca zabezp spol 6 no.6:30-33 Je '64.

BROJEWSKI, Maksymilian

Periods of suspending and reinstating the title to social security pensions. Praca zabezp spol 6 no.12:29-32 D '64.

BROJEWSKI, Maksymilian

Decisions concerning temporary work disability for past periods. Praca zabezp spol 7 no.1:39-42 Ja '65.

BROJEWSKI, Maksymilian

Social Security funeral allowance and the obligation to pay the funeral costs. Praca zabesp spol 5 no.7:45-48 Jl '63.

BROK, Aleksandr Arturovich; ZAUSAYLOV, Boris Alekseyevich; STEPANOV, Nikolay Grigor'yevich; KOLTUNOVA, M.P., red.; BOBROVA, Ye.N., tekhn.red.

[Fundamentals of safety engineering and fire prevention measures in railroad transportation] Osnovy tekhniki bezopasnosti i protivopozharnoi tekhniki na zheleznodorozhnom transporte. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1960. 234 p. (MIRA 14:4)

(Railroads--Safety measures)
(Railroads--Fires and fire prevention)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R000307010010-9"

BROK, V. A.

"Temperature Anomalies of Spring and the Beginning of Summer in the Southeastern Part of Western Siberia." Cand Geog Sci, Chair of Climatology and Meteorology, Tomsk State U imeni V. V. Kuybyshev, Tomsk, 1955. (KL, No 15, Apr 55.

SO: Sum. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (16).

BROK, V.A., kand.geogr.nauk; KOVALEVA, T.Ye., inzh.; KEL'CHEVSKAYA, L.S., starshiy inzhener; IZNAIRSKAYA, I.A., starshiy inzhener; KUKHARSKAYA, V.L.; PAKHNEVICH, K.P., inzh.; DYMOVICH, Yu.L., inzh.; VOROB'YEVA, T.P., inzh.; PAKHNEVICH, S.Ya., otv.red.; LEONTOVICH, B.V., nauchno-tekhn.red.; USHAKOVA, T.V., red.; SERGEYEV, A.N., tekhn.red.

[Agroclimatic reference book on Kemerovo Province] Agroklimaticheskii spravochnik po Kemerovskoi oblasti. Leningrad, Gidrometeor.izd-vo, 1959. 135 p. (MIRA 13:2)

1. Novosibirsk. Gidrometeorologicheskaya observatoriya.
2. Novosibirskaya gidrometeorologicheskaya observatoriya (for Brok, Kovaleva, Kel'chevskaya, Iznairskaya, Kukharskaya, K.P. Pakhnevich, Dymovich, Vorob'yeva). 3. Direktor Novosibirskoy gidrometeorologicheskoy observatorii (for Leontovich).
(Kemerovo Province--Crops and climate)

BROK, V.A.

Climatological characteristics of temperature anomalies in the south-eastern part of Western Siberia. Trudy TGU 147:136-144 '57.
(MIRA 16:5)

(Siberia, Western—Atmospheric temperature)

17 (2)

AUTHORS: Bass, I. A., Broker, T. N., Gol'dfarb, D. M., Gorlenko, Zh. M., Il'yashenko, B. N., Nankina, V. P., Khesin, R. B.

SOV/20-129-6-61/69

TITLE: Infectious Properties of Injured Phages

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 6, pp 1421 - 1423 (USSR)

ABSTRACT: D. Fraser and co-workers (Ref 12) concluded from their investigations that the infectious activity of the destroyed preparations of phage T2 is related to the desoxyribonucleic acid (DNA) which was liberated from the protein covers of the phage particles by the effect of urea. The results obtained by the authors, however, were rather divergent. Therefore, they thoroughly investigated the preparations formed from bacteriophages by treatment with urea. The following dysentery phages were used: T4r, DM (isolated from the soil by T. N. Broker), and N-2 (obtained by F. I. Yershov, 2-y Moskovskiy gosudarstvennyy meditsinskiy institut, Second Moscow State Medical Institute). The effect of the phages was tested on protoplasts (bacteria without cell walls). The authors obtained them from cells of the following bacterial strains by means of lysozyme according to R. Repaske

Card 1/4

(Ref 13): E. coli B (sensitive to phage T4r and DM); E. coli 600 (resistant to all three phages mentioned); and Sh. dys. Newcastle (obtained by F. I. Yershov, sensitive to N-2). Suspensions of phages, concentrated to 10^{12} particles in 1 ml, were treated with an 8 M urea solution. Thereafter, the action of phages on intact cells was completely eliminated. They showed an activity of 0.00001 to 0.001% on protoplasts. This effect concerns bacteria strains sensitive to phages as well as those resistant to phages. Thus, this remaining activity cannot be due to the preservation of a few phage particles. Further experiments showed that the above residual infectivity is not related to the free DNA which has left the virus particles. Thus, it could be assumed that only the part of the DNA is active which is protected against the used desoxyribonuclease by other components of the phage (probably by proteins). In order to check this assumption, the proteins were separated from the preparations by phenol or chloroform. The preparations were completely inactivated in spite of the proved extensive separation of the proteins from the DNA. This proved again that, after treatment with urea, infectious activity is not due to free DNA. On the other hand, it has been known that the protein component isolated from the phage cannot cause phage reproduction in the bacteria. The only assumption is that one complex of the DNA with the protein has infectious activity. It was serologically proved that the proteins of the active complexes mentioned are similar to the antigenes of normal phage particles. The transition of 80-90% of activity into the precipitate could be achieved by centrifugation of virus preparations treated with urea as well as by suspensions of intact phages. The electron microscope showed that the above complex has corpuscular structure and that it is of about the same size as the intact phage. Figures 1 and 2 show that, apparently, urea destroys only the distal parts of the processes. Thus, the phage particles become incapable of depositing on normal bacteria. The inner part of the process axis which consists of protein is uncovered by the urea effect. Further experiments with trypsin, which destroyed the uncovered part, brought about complete suppression of activity. Thus, the protein in the axis of the phage particle is necessary for the occurrence of the infectious activity of the preparations mentioned. There are 1 figure and 13 references.

Infectious Properties of Injured Phages SOV/20-129-6-61/69

ASSOCIATION: Institut biofiziki Akademii nauk SSSR (Institute of Biophysics of the Academy of Sciences, USSR). Institut epidemiologii i mikrobiologii im. N. F. Gamaleya Akademii meditsinskikh nauk SSSR (Institute of Epidemiology and Microbiology imeni N. F. Gamaley of the Academy of Medical Sciences, USSR)

PRESENTED: June 10, 1959, by I. L. Knunyants, Academician

SUBMITTED: May 29, 1959

Card 4/4

VLASOV, V.V., kand. med. nauk (Novosibirsk); BROKHES, L.I. (Novosibirsk); SHTERNSHIS, Yu.S. (Novosibirsk)

Effective anticoagulant treatment in thromboembolism of the pulmonary artery. Khirurgiia 40 no.11:121-122 N '65. (MIRA 18:7)

BROKSH, M.M.; GVOZDEV, B.P.; ZAYTSEV, V.I.; ESTRINA, A.A.; SALTYKOV, A.L.

Investigating a full-scale model of a spherical scrubber, a ball-shaped dust collector. Trudy VNIIGAZ no.21/29:172-182 '64. (MIRA 17:9)

BROKSH, M.M.; YERMOSHINA, M.S.; SALTYKOV, A.L.; ESTRINA, A.A.

Checking the liquid content in gas flow. Trudy VNIIGAZ no.21/29:183-195 '64. (MIRA 17:9)

BROKSH, M.M.; GVOZDEV, B.P.; KVASHUK, V.S.; KOSHELEV, V.A.

Using cermet filters to remove solid impurities from natural gas. Trudy VNIIGAZ no.21/29:205-217 '64. (MIRA 17:9)

BASS, I.A.; BROKER, T.N.; GOL'DFARB, D.M.; GORLENKO, Zh.M.; IL'YASHENKO, B.N.; NANKINA, V.P.; KHESIN, R.B.

Significance of proteins for the infectivity of bacteriophages treated with urea. Biokhimiia 25 no.2:360-367 Mr-Ap '60. (MIRA 14:5)

1, Institut biofiziki Akademii nauk SSSR i Institut epidemiologii i mikrobiologii im. N.F.Gamaleya Akademii meditsinskikh nauk SSSR, Moskva.

(BACTERIOPHAGE) (UREA) (PROTEINS)

BROKER, T.N.

Mechanism of antiphage activity of antitumor preparations. Zhur. mikrobiol. epid. i immun. 31 no.2:84-89 D '60. (MIRA 14:6)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(BACTERIOPHAGE) (URACIL) (DIETHYLAMINE) (ALANINE)

BROKARENKO, Konstantin Kuz'mich; IGNATOV, Viktor Nikolayevich; PETROV, Boris Ivanovich; EPSHTEYN, D.M., red.; KHITROV, P.A., tekhn.red.

[Technological training for students specializing in railroad transportation; organization and methods] Professional'no-tekhnicheskoe obuchenie na zheleznodorozhnom transporte; organizatsiia i metodika. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 255 p. (MIRA 12:6)

(Railroads)

GOL'DFARB, D.M.; BROKER, T.N.

Antiphage properties of certain antibiotics, antiseptics, amino acids and antitumor drugs. Vop. virus. 4 no.1:103-108 Ja-F '59. (MIRA 12:4)

1. Laboratoriya izmen chivosti mikrobov i otdel epidemiologii Instituta epidemiologii i mikrobiologii imeni N.F. Gamalei AMN SSSR, Moskva.
(BACTERIOPHAGE, effect of drugs on,
repeat title (Rus))

MARDASHEV, S.R.; MARGORINA, L.M.; LESTROVAYA, N.N.; BROKER, T.N.

Amino acid decarboxylases in bacteria of the intestinal group.
Zh. mikrobiol. 40 no.7:25-29 Jl'63 (MIRA 17:1)

1. Iz Instituta biologicheskoy i meditsinskoy khimii AMN SSSR i Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

PETROV, V.I.; GOELEVSKAYA, M.V.; SYRKASHEVA, A.V.; RAYKHSHTAT, G.N.; SHAPIRO, A.A.; BERLOVICH, E.A.; KARASEVA, M.F.; RYUMINA, M.G. LEYKINA, R.S.; BROKER, T.N.; GITARIN, D.Yu.; MOSKOVENKO, D.F.; STASILEVICH, Z.K.; REUT, A.I., ALIYEVA, S.G.

Annotations. Zhur. mikrobiol., epid. i immun. 40 no.2:109-112 F '63. (MIRA 17:2)

1. Iz Dnepropetrovskoy gorodskoy sanitarno-epidemiologicheskoy stantsii (for Petrov). 2. Iz Saratovskogo meditsinskogo instituta i Saratovskoy gorodskoy sanitarno epidemiologicheskoy stantsii (for Godlevskaya, Syrkasheva). 3. Iz sanitarno-epidemiologicheskoy stantsii Sverdlovskogo rayona Moskovy (for Raykhshtat, Shapiro, Berlovich, Karaseva, Ryumina, Leykina, Broker). 4. Iz Instituta eksperimental'noy patologii i terapii AMN SSSR (for Stasilevich). 5. Iz Belorusskogo sanutarni-gigiyenicheskogo instituta (for Reut). 6. Iz Uzbekskogo nauchno-issledovatel'skogo kozhno-venerologicheskogo instituta (for Aliyeva).

RAYKHSHTAT, G.N.; SHAPIRO, A.A.; LEYKINA, R.F.; KARASEVA, M.F.; BERLOVICH, E.A.; RYUMINA, M.G.; BROKER, T.N.; KUZNETSOVA, N.S.

Epidemiological effectiveness of preventive bacteriophage treatment against dysentery in pediatric institutions. Zhur. mikrobiol., epid. i immun. 42 no.8:139-141 Ag '65. (MIRA 18:9)

1. Sanitarno-epidemiologicheskaya stantsiya Sverdlovskogo rayona Moskvy.

BROKHES, G. I. and KAKHSHTADT, A. G.

"The Influence of Hardening With High Frequency Heated Currents on the Resilience of Steel," p. 43 of the book "Problems on Strength and Deformation of Metals and Alloys", released by the Moscow Engineer-Physics Inst., Mashgiz, 1954.

TABCON D-342613, 24 Oct 1955

BROKHES, L.I.; NISNEVICH, Ya.G. (Novosibirsk)

Migrating source of ventricular excitation in Fredericq's syndrome. Terap. arkh. 35 no.9:109-114 S'63 (MIRA 17:4)

BROKHES, L.I. (Novosibirsk)

Negative coronary T_3 electrocardiogram as a manifestation of heart abnormality. Kaz. med. zhur. no.6:47-50 N-D '63. (MIRA 17:10)

BROKHES, L.I.

Parasystole. Kardiologiia no.5:74-75 '65. (MIRA 18:10)

1. Gospital'naya terapevticheskaya klinika (zav. - prof. A.A.Demin) Novosibirskogo meditsinskogo instituta.

Hard alloy. Yu P Biryukov, I. S Brokhin and I A Petrinskii Russ 20,250, June 24, 1931. A hard alloy consists of Ni 20-50, W 10-25, Cr 20-35, Fe 5-25 and C 1-5%.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND GROUPS

PROCESSES AND PROPERTIES INDEX

Determination of the Hardness of the Structural Components of Cast Hard Alloys (Micro-Hardness). I. S. Brokhin (*Zavodskaia Laboratoria* (*Works' Lab.*), 1935, 4, (12), 1480-1483).—[In Russian.] Methods for the determination of the hardness of the individual structural components of Stellite and similar alloys in which nickel is substituted for cobalt (Sormite; Smena).—D. N. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

M

2

***Investigation of Hard Alloys Without Tungsten. Sormite Type.** I. S. Brokhin and F. I. Domorkin (*Sobshenia Zentralnogo Instituta Metallov Leningrad* (*Comm. Central Inst. Metals, Leningrad*), 1933, (18), 95–113; *C. Abs.*, 1936, **30**, 8126).—[In Russian.] The influence of silicon, nickel, and chromium on Sormite was studied, and a method for welding on the hard alloys was developed. Silicon above 4·5% increases the hardness and resistance to wear, but results in irregular values for temporary resistance to rupture and resistance to bending. There is a decrease in corrosion with a high silicon content. The nickel content can be reduced to 3% without affecting the mechanical properties or changing the microstructure. Carbon increases the hardness and resistance to wear. Addition of 30% or more chromium greatly increases the corrosion-resistance. The best composition for Sormite is chromium 25–29, nickel 3–6, carbon 2·7–3·3, silicon 3·5–4·5, manganese up to 1·5, phosphorus and sulphur each not more than 0·07%. Two hard alloy layers (1·2–3 mm.) should be welded on, and the zone of overheating should be subjected to hardening, normalizing, and quenching in oil. Such heat-treatment will not affect the structure and properties of the primary cast alloy.

—S. G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

*Investigation of the Components of Cast Hard Alloys. J. S. Brokhin, F. I. Domorkin, and S. Ya. Ar'eva (*Metallurg* (*Metallurgist*), 1935, 10, (11), 17-31; *C. Abs.*, 1936, 30, 5920).—[In Russian.] Alloys corresponding in composition to Sormite were subjected to microscopic and X-ray examination. The carbides were found to have the composition ($(Cr,Fe)_7C_3$ or $(Cr,Fe)_4C_3$. The carbides found as primary and as eutectic are identical.—N. B. V.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

The physical-mechanical properties of metal-ceramic hard alloys at elevated temperatures. I. S. Brokhin. *Vestnik Metalloprom.* 16, No. 14, 63-71, No. 15, 20-5 (1936); *Chem. Zentr.* 1937, I, 2856.—Specimens of pobjedite contg. about 5.3% C, 10.11% Co, 82.4% W, 0.17% Si and the remainder Fe were tested. The relatively high hardness at ordinary temps. decreased somewhat upon heating to about 500°. The bending strength of 125 kg./sq. mm. at ordinary temps. decreased between 500° and 800° to about 80 kg./sq. mm. At ordinary temps. the elasticity of compression was about 200 kg./sq. mm., the breaking strength about 50-60 kg./sq. mm. At 900° the latter was 20 kg./sq. mm. The impact resistance was slight but changed very little upon heating. According to dilatometer measurements a transition occurs at 550-750° accompanied by a change in vol., which is obviously the result of a change in phase of the Co. No change in the microstructure could be detected metallographically up to 900°. Upon heating in the air at 450-500° an oxide layer formed which reached a thickness of 1-1.5 mm. It was soft and could be easily removed.

M. G. Moore

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Surface interaction between soft iron and molten alloy cast iron and nature of interstitial layers. I. S. Brokhin and A. I. Zverev. *Vestnik Metalloprom.* (U.S.S.R.) No. 14-15, 117-26(1937). The object of this investigation was to det. the chem. and phys. changes taking place on the surface of solid iron contg. Si a trace, C 0.02, Mn 0.07, P 0.008 and S 0.012%, when immersed in liquid sormite contg. Cr 27.35, Si 4.40, C 3.30, Ni 4.10, Mn 1.20 and P 0.07%. Two parallel processes take place: (1) partial fusion of the pure iron at the surface and (2) diffusion of the constituents of the sormite into the soft iron. The 2nd process continues even after the solid iron is withdrawn from the sormite bath and is allowed to cool. Micrographs are given of cross sections of the layer formed on the pure iron. S. L. Madorsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

9

The chemical composition and structure of stalinite I. S. Brokhin. *Avtogennoe Delo* 1939, No. 2-3, 23-5; *Khim. Referat. Zhur.* 1939, No. 8, 77.—The hardness, chem. compn. and wearing properties of the stalinite produced by the usual arc method and by metallic electrodes were investigated. Stalinite, contg. Cr 16-20, Mn 13-17, C 8-10, Si ≤3, P ≤0.2 and S ≤0.15%, was produced from ferrochrome, ferromanganese, cast-iron shavings, petroleum coke and molasses as binding substances. Metallic electrodes produced a melt which was less alloyed and whose hardness was correspondingly lower. The wear resistance of the products (V_{30} according to Savin) of the elec. arc and of metallic electrodes were 300 and 350, resp.

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Electrodes with alloy coatings for wear-resistant weld metal. I. S. Brokhin. *Avtogennoe Delo* 1940, No. 4-5, 10-14.—~~A study was made~~ of the chem. compn., micro-structure and hardness of Cr, Mn and stalinite weld metals for the resp. electrodes with alloy coatings. The Cr-Mn electrode selected contains Cr 35-40, Mn 28-32 and C 7-8%. It was prepd. from a mixt. of ground car-bonaceous Fe-Cr 55-60, Fe-Mn 37-40 and chalk and marble 10% in water glass. The most interesting, from a practical viewpoint, are austenite electrodes with the coating weighing 35-45% of the electrode and also marten-site electrodes with the coating equal to 15-25% of the wt. of the electrode. These electrodes are superior to the Cr and Mn electrodes. B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

S 8

Centrifugal Lining of Cylinder Liners with Boron-Bearing Cast Iron. I. S. Brokhin and A. A. Davydov. (Vestnik Metallopromyshlennosti, 1940, No. 6, pp. 66–67). (In Russian). Steel cylinder liners of mud pumps used in drilling oil wells have been lined with a cast iron containing 0·7–1·2% of boron to improve the wear resistance. Ferro-boron (containing 10–15% of boron) was produced by an aluminothermic reaction, and the boron-bearing iron by melting in an electric furnace. The requisite quantity of the alloy was placed in the liner, which was closed by end plates welded or screwed on. The alloy was then melted in the liner by heating to 1200° C., after which the coating was formed by rotating the liner at 800 r.p.m. for 4–6 min. The inside of the liner was then ground to size. The alloys had a hardness of Rockwell C. 67–70. A liner coated as described lasted longer than nine plain steel liners.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

9

Iron-base chromium-titanium alloy for casting tools. I. S. Brokhin and D. O. Slavin. U.S.S.R. 65,933, Feb. 28, 1940. The alloy contains C 1.5-3.5, Cr 8-15, and Ti 2.5-
5.5%. In addn. 2-5% of Ni can be added to the alloy.

M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

USSR/Metals - Electron Microscopy Nov 50

"Investigation of Metal Powders With the Aid of Electron Microscope," I. S. Brokhin, L. M. Bursuk, All-Union Sci Res Inst Hard Alloys

"Zavod Lab" No 11, pp 1331-1335

Describes procedure, giving results for examn of various metal powders under electron microscope at 6,000-10,000 X magnification. Studied powders of wolfram and its carbide, nickel, and cobalt. Reproductions of several electron photomicrographs.

180T77

BROKHIN, I.S.

131-12-7/9

AUTHORS: Brokhin, I.S., Funke, V.F.

TITLE: Obtaining and Investigating Certain Properties of Ceramics From Silicon Nitride (Polucheniye i issledovaniye nekotorykh svoystv keramiki iz nitrida kremniya)

PERIODICAL: Ogneupory, 1957, Nr 12, pp. 562-566 (USSR)

ABSTRACT: According to published data the silicon-nitrogen system has three phases: Si_3N_4, Si_2N_3 and SiN, where the phase Si_3N_4 with 39.5% nitrogen is chemically the most stable and the most important in practice. Further, the properties of Si N are described in detail as also the method by which it is obtained from silicon powder, the chemical composition of which is shown in table 1. Figure 1 shows the saturation curves of silicon by nitrogen at various temperatures. Figure 2 shows the nitrogen content in silicon in dependence of the duration of nitration at 1600°. Table 2 shows the influence exercised by an addition of silicon upon the sintering of the silicon nitride (hot pressing at 1400° and 800 kg/cm^2). In table 3 the properties of test samples of silicon nitride are described (Nitration temperature 1500°). Also bending strength and the resistance against oxidation were tested in dependence on temperature.

Card 1/2

131-12-7/9

The Discovery and Investigation of Certain Properties of Ceramics From Silicon Nitride

(See tables 4 and 5, as well as fig. 4). There are 5 figures, 5 tables, and 8 references, 2 of which are Slavic.

ASSOCIATION: All-Union Scientific Research Institute of Hard Alloys (Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov)

AVAILABLE: Library of Congress

Card 2/2

BROKHIN, A.S.

p. 6

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machinery at elevated temperatures.

...Works imeni Lenin (Leningrad)
The representative of the Leningrad ...
Engineer P. N. Shibalov conveyed informati...
of equipment for heating individual elements ...
...-24-... turbine during starting.

...
In his paper work of the Institute of ...
and Special Alloys, Ukrainian Ac.Sc. ...
High Temperature Strength ...

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[illegible] Matveyev [illegible]

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[illegible] strength of specimens of [illegible] complicated [illegible] conditions [illegible] relation to the operating conditions [illegible] features of [illegible] equipment which ensures [illegible] of long duration tests of material [illegible] by [illegible] at a high temperature until disruption occu[illegible] considered the deformations of a disc in [illegible]

[illegible] at Elevated Temperatures

duration disruption, the character [illegible]
of the projections provided for. Fatig[illegible]
the character is described of the [illegible]
[illegible] and after [illegible]
[illegible] of turbine blades [illegible]
at Elevated Temperatures [illegible]
with the method developed by [illegible]
oscillations permitting creation of [illegible]
magnitudes and frequencies of the [illegible]
[illegible], giving some of the results [illegible]

[illegible] of Components of Gas Turbines [illegible]
Consideration Variable Stresses and [illegible]
Ye. F. Rusanova ([illegible]) considered the [illegible]
disruption and the possibility of r[illegible]

AUTHORS: Brokhin, I. S., Funke, V. F. 78-3-4-2/38

TITLE: Investigation of the Solubility and Phase Composition in the System Silicon-Carbon (Issledovaniye rastvorimosti i fazovogo sostava v sisteme kremniy-uglerod)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 847--853 (USSR)

ABSTRACT: The solubility of carbon in silicon, the phase composition and the structure of silicon-carbon alloys as well as the problem of the dissociation of silicon carbide in vacuum at higher temperatures were investigated.
The investigation of the phase diagram in the system Si-C was carried out in three parts:
1.-Determination of the solubility of carbon in silicon;
2.-Determination of the phase composition in the range Si-SiC;
3.-Explanation of the formation of the SiC phase.
For the investigation of the phase composition and the structure of the alloys metallographic and x-ray structural analyses as well as the determination of microhardness were carried out.
The metallographic investigations showed that the alloys consist of one phase up to 0,7% C.

Card 1/2

Investigation of the Solubility and Phase Composition in the System Silicon-Carbon 78-3-4-2/38

The alloys containing more than 0,8% C consist of two phases: solid solution C in Si (light field) and silicon carbide (dark field).
In the thermal treatment of silicon carbide in vacuum at 2000--2100°C a complete dissociation of silicon carbide occurs with Si evaporating and C forming a graphite residue.
The graphite lines were proved by the x-ray structure analyses.
No solubility of Si was found in silicon carbide.
There are 14 figures, 3 tables, and 5 references, 2 of which are Soviet.

ASSOCIATION: Vsesoyuznvy nauchno-issledovatel'skiy institut tverdykh splavov, Moskva (Moscow, All-Union Scientific Institute for Hard Alloys)

Card 2/2

AUTHORS: Smiryagin, A. P., Potemkin, A. Ya., Martynyuk, R. P. 78-3-4-3/38

TITLE: Investigation of the Phase Diagram Nickel-Molybdenum-Chromium (Issledovaniye diagrammy sostoyaniya nikel'-molibden-khrom)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 853-859 (USSR)

ABSTRACT: The nickel corner in the phase diagram of the system Ni-Mo-Cr (up to 40% molybdenum and up to 40% chromium) was investigated using the thermal and microscopic analysis.
Eight polythermal sections of the nickel corner in the phase diagram nickel-molybdenum-chromium were constructed. The phase composition and the hardness of the alloys were investigated at temperatures of 1270°, 1200°, 950°, 800° and 700°C. The saturation limit of the ternary solid solution of the basis of nickel was determined at temperatures of 700°, 800°, 950° and 1000°C.
It was shown that with a drop of temperature the solubility of molybdenum and chromium in nickel decreases markedly. Also the sectional diagrams with a constant content of 4%, 8,5%, 3,5% and 20% of chromium were constructed.

SOV/136-58-9-13/21

AUTHORS: ~~Brokhin, I.S.~~, Zolotarev, I.S. and Baranov, A.I.

TITLE: Some Properties of Molybdenum Disilicide (Nekotoryye svoystva distilitsida molibdena)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 9, pp 61-67 (USSR)

ABSTRACT: Molybdenum disilicide has good resistance to scaling at temperatures up to 1700°C combined with other useful properties (e.g. metallic electrical conductivity) and the study of this compound has been proceeding in recent years (Refs 3-7). The authors describe their investigation of the high-temperature mechanical properties of the compound and of a preparation with an excess of silicon. The disilicide was prepared by sintering at 1100-1200°C from hydrogen reduced molybdenum (0.005% Fe, 0.002% Ni, 0.03% O, rest Mo) and grade Kr-0 silicon (99% Si) further purified by acid treatment and the blanks obtained (Table 2) were ground and made into 6 x 6 x 60 mm pieces (Table 3) by sintering under pressure at 1500-1550°C. From these the test pieces were prepared. The chemical nature of specimens obtained was confirmed by X-ray and chemical analysis and by determinations of micro-hardness

Card 1/2

and resistance to scaling. The hardness has been determined up to 1 000 °C (Figure 2) and the micro-hardness and scaling resistance (1 200 °C). Tests on specimens with 3, 5 and 10% excess Si showed that 5% excess Si is beneficial. Long-term bending tests were carried out in a special installation (Figure 3) to determine the plastic deformation of $MoSi_2$ and $MoSi_2$ x x 5% Si at 1 200 °C with relatively small (up to 20 kg/mm^2) stresses. Tensile strengths in bending were also determined at 20, 1 000, 1 100 and 1 200 °C.
There are 4 figures, 4 tables and 8 references, 1 of which is Soviet, 3 German, 3 English and 1 Czech.

ASSOCIATION: VNIITS

Card 2/2

1. Molybdenum silicides--Properties 2. Molybdenum silicides --Temperature factors 3. Molybdenum silicides--Mechanical properties 4. Molybdenum silicides--Test results

SOV/136-59-3-14/21

AUTHORS: Brokhin, I.S., Ol'khov, I.I.

TITLE: The Scale-stability of Cermet Alloys Based on Titanium Carbide (Okalinostoykost' metallokeramicheskikh splavov na osnove karbida titana)

PERIODICAL: Tsvetnyye Metally, 1959, Nr 3, pp 61 - 66 (USSR)

ABSTRACT: The initial materials were titanium dioxide, niobium pentoxide, powdered niobium (containing 1-3% tantalum), tungsten carbide, lamp-black and powdered cobalt reduced from its oxalate. Alloys were prepared by mixing for 24 hours and then heating in a hydrogen atmosphere in an electric furnace. X-ray analysis of the specimens prepared from individual carbides of titanium and niobium showed the lines corresponding to the two carbides (TiC - 4.32 Å, NbC - 4.46 Å), whereas the alloy containing 87% TiC and 13% NbC showed only one phase with lattice parameter 4.37 ± 0.03 Å (TiC-NbC solid solution). The microhardness of niobium carbide and of the complex titanium-niobium carbide was shown to be 1 822 and 2 472 kg/mm^2. All the samples of titanium-tungsten carbide were single-phased with a crystal lattice of TiC. The powdered carbides were mixed with cobalt by wet grinding

Card1/4

for five days, pressed with a stress of 1 000 kg/cm^2 and sintered at 1 450 - 1 560 °C in hydrogen. Figures 1 and 2 show typical microstructures of TiC-NbC-Co and TiC-WC-Co. The alloys were tested at 900-1 200 °C for 100 hours, the gain in weight and the thickness of oxide layer being noted. Diagram 3 shows that with increase of NbC in TiC-NbC-Co alloys there is a sharp decrease in weight gain from 5-1 g/m^2 per hour. With further increase in NbC the weight gain is practically constant. Figure 4 shows the weight gain of alloys containing 25% Co and 3-15% NbC. The scale-stability is a maximum with 15% NbC at all temperatures. Further increase of NbC to 25% has no further effect. Varying the cobalt content showed that the weight gain was a minimum at 25% Co. Specimens prepared from simple carbides gave similar results to those prepared from complex carbides but in all cases the former had a greater weight gain than the latter. At 1 000 °C the surface has a grey colour due to breaking up of the scale and at 1 100 - 1 200 °C there is a thicker layer on the surface. The TiC-WC-Co alloys were prepared from the complex carbides. Figure 5 shows the weight gain of alloys containing 15 and 30% WC both with 18 wt.% cobalt. At 900 °C, the weight gain is practically the same for both alloys but at higher temperatures the 30% WC alloy has a lower weight gain. The effect of Co content is shown in Figure 6 (the ratio TiC:WC is 65:35). With increase from 10 to 20% Co there is an increase in oxidation resistance which is more marked at higher temperatures. With alloys with TiC:WC ratio of 85:15 the effect of Co increase is less marked. At temperatures higher than 1 100 °C all the alloys oxidise rapidly. In both TiC-NbC and TiC-WC alloys oxidation spreads in the first instance along the cementing phase. The TiC-NbC-WC-Co alloy containing 10-15% NbC has better scale stability than TiC-WC-Co alloys but not as good as TiC-NbC-Co alloys. The TiC-15NbC-25Co alloy is suitable up to 1 100 °C and the TiC-30WC-15-20Co up to 900 °C.

SOV/136-59-3-14/21

The Scale-stability of Cermet Alloys Based on Titanium Carbide

There are 7 figures, 1 table and 13 references, 8 of which are English and 5 German.

ASSOCIATION: VNIITS

Card 4/4

15.2210, 15.2220, 18.8200

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SOV/136-59-10-17/24

AUTHORS: Brokhin, I.S., Ol'khov, I.I. and Platov, A.B.

TITLE: Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

PERIODICAL: Tsvetnyye metally, 1959, Nr 10, pp 73-82 (USSR)

ABSTRACT: One of the new materials that have recently found wide application in the manufacture of cutting tools, drawing dies and other wear-resistant components, is a ceramic material based on sintered alumina and produced at the Moscow Hard Metals Combine under the name of TsM-332 (Ref 1). This product, characterized by finely crystalline structure (average grain size up to 2 μ) and low porosity (specific gravity ~ 3.9 g/cm^3), is made of commercial grade α-alumina with a small (about 0.5%) addition of MgO by sintering at approximately 1700 °C. Shrinking during sintering amounts to 18 to 20%. The object of the investigation described in the present paper was to measure hardness, transverse rupture stress, UTS and compressive strength of TsM-332 and certain other wear-resistant materials, both at room and elevated temperatures. Hardness measurements were taken in vacuum, using a diamond indenter, 1 kg load and polished cylindrical test

Card 1/7

65696

SOV/136-59-10-13/18

Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

pieces 15 mm diameter and 5 mm high. The specimens were held at the test temperature for 20 min before applying the load of 30 sec duration; not less than six measurements were taken at each temperature, each new test temperature being attained by cooling. After cooling to room temperature, the specimens were photographed (x 420), the diagonals of the indentation were measured and the VPN values were found from the tables. The results are reproduced in the form of an H_V(kg/mm^2) versus t(°C) curve in Fig 1a (curve 3) where, for comparison, the results obtained by other workers are also shown: curve 1, based on the measurements of Betaneli (Ref 5), who used a 250 kg load, and curve 2, based on data due to Kazakov (Ref 6), who used a 1 kg load. It will be seen that hardness of TsM-332 decreases monotonically and linearly with rising temperature from about 1800 VPN at room temperature to about 600 at 1000°C and to 350 at 1100°C. Fig 1a shows photographs of the diamond pyramid indentations made on TsM-332 specimens under the following conditions of loading and temperature:

Card 2/7

65696
SOV/136-59-10-13/18

Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

1 to 5 kg, 20°C (H_v equal 1800 kg/mm^2); 2 to 1 kg, 700°C (H_v equal 960 kg/mm^2); 3 to 1 kg, 1000°C (H_v equal 540 kg/mm^2). Hair cracks (originating at the corners of the indentations), visible clearly on these photographs, occurred even when the hardness measurement was taken at the highest test temperature; they were even more pronounced when a Rockwell machine (scale A, load 60 kg) was used (see Fig 3). No cracks were observed on specimens used for microhardness measurements (load 100 g) at room temperature, which gave values of H_v equal 1900 to 2000 kg/mm^2. In the next stage of the investigation, hardness of the following hard alloys was measured: (a) standard titanium-tungsten alloys T5K10, T14K8, T15K6, T30K4 and T5K6; (b) new types of tungsten-cobalt alloys (VK6V, VK8V, VK15V) characterized by high strength and coarsely-crystalline structure (average grain size of the WC phase - 3 to 5 μ) made by the method developed by VNIITS and based on tungsten obtained by reduction at 1200°C; (c) alloy VK6M, characterized by improved wear resistance and finely crystalline structure

Card 3/7

(average WC grain size of approximately 1 μ) and made by a process involving intensified wet grinding of the powder mixture. The results of these measurements (load 1 kg, loading time - 30 sec) are reproduced in Table 1 (for the titanium-tungsten alloys) and Table 2 (for the tungsten-cobalt alloys) in which the test temperature (°C) is given in the first columns. Curves plotted in Fig 1b show the temperature dependence of H_V for the following alloys: 1 - T30K4; 2 - T15K6; 3 - T14K8; 4 - T5K10. The same relationship for the tungsten-cobalt alloys is illustrated by curves plotted in Fig 1B: 1 - VK6M; 2 - VK6V; 3 - VK8V; 4 - VK15V; 5 - (for comparison) TsM-332. Photographs of diamond pyramid indentations obtained on T5K10 specimens at (1) - 20, (2) - 600 and (3) - 1000°C (corresponding to H_V values of 1650, 850 and 260 respectively) are reproduced in Fig 2b; finally, similar photographs for VK8V specimens at 200, 600 and 1000°C (the corresponding H_V values being 1500, 650 and 200) are shown in Fig 2B (1, 2 and 3 respectively). In the next series of experiments, the

65696
SOV/136-59-10-13/18

Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

transverse rupture stress, $\sigma_{изг}$; of the investigated materials was determined at temperatures up to 1200°C, a universal testing machine P5, equipped with a silit heating device, was used for this purpose. The test pieces, measuring 5 x 5 x 40 mm, resting on prismatic supports made of heat-resisting material, were maintained at the test temperature for 5 to 7 min before the load was applied at a strain rate of 11 mm/min. The results for the TsM-332 specimens are given in Table 3 under the following headings: test temperature, °C; $\sigma_{изг}$, kg/mm^2; number of tested specimens; scatter of results, %. The data given in Table 3 are also reproduced graphically in Fig 4. The temperature dependence of $\sigma_{изг}$ of VK and TK alloys, is illustrated in Fig 5a and 5b respectively. Flat, radiused test pieces were used for the determination of the UTS of the investigated materials. (Tested TsM-332 specimens are shown in Fig 6.) A standard tensile testing machine, or a specially adapted creep testing apparatus, was employed for this purpose, a gradual application of the "dead weight" load being attained by the use of copper

Card 5/7

65696

SOV/136-59-10-13/18

Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

granules; particular care was taken to ensure axial loading of the brittle specimens and the results of any test, in which fracture of the test piece occurred at a distance of more than 5 mm from its centre, were ignored. UTS of TsM-332 determined in this manner was 15 to 16 kg/mm^2. In the final series of experiments, the compressive strength of TsM-332 was determined on cylindrical specimens (10 mm diameter and 15 mm thick), tested on a 30 t hydraulic machine equipped with hard alloy supports. 90 Specimens, taken from two batches of TsM-332, were tested; the scatter of the results amounted to 20%. The average values of the compressive strengths equal to 80 to 90 kg/mm^2, were much lower than those obtained by other workers. In the conclusions, it is claimed that the results of the present investigation are more accurate than those quoted in the literature. Attention is drawn to the fact that hardness of the VK6M alloy decreases with rising temperature at a rate much slower than that of other investigated materials (H_v of this alloy being 1400 kg/mm^2 at 600°C and that both

Card 6/7

65696
SOV/136-59-10-13/18

Mechanical Properties of Ceramic Tool Materials and Hard Alloys at Elevated Temperatures

hardness and UTS of the ceramic material based on Al_2O_3 at 1200°C are higher than those of other materials. There are 6 figures, 3 tables and 10 references, 8 of which are Soviet and 2 German.

ASSOCIATION: VNIITS

Card 7/7

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R000307010010-9"

S/736/60/000/002/002/007

AUTHORS: Brokhin, I.S., Zolotarev, I.S., Baranov, A.I.

TITLE: The making and investigation of the properties of Mo disilicide.

SOURCE: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov. Sbornik trudov. no.2. Moscow, 1960. Tverdyye splavy. pp. 24-36.

TEXT: Mo disilicide has recently gained in interest because of its exceptionally high scale-resistance up to 1700°C, especially in the making of heating elements for resistance-type electric furnaces. Three Mo-Si compounds are known to exist: Mo_3Si, Mo_3Si_2, and $MoSi_2$. R.Kieffer's and E.Cerwenka's phase diagram (Zs. f. Metallkunde, v.43, no.4, 1952) is used. Si solubility in Mo at 1200° is 0.15% and at 1400° 0.8% Si. The types of crystalline lattice, densities, m.p.'s, and microhardnesses (100-g load) of the three compounds are tabulated. $MoSi_2$ is a metallic conductor of electricity (21 μohm/cm) and is the most highly scale-resistant Mo-Si compound, owing to the formation on it of a dense and strong vitreous SiO_2 film, 0.03 to 0.1 mm thick. Oxidation at 1350-1400°C is most effective. Above 1700° the SiO_2 film melts, coagulates in droplets, and loses its protective properties. The oxidation mechanism of Mo disilicide changes abruptly at 450-600°, at which point a rapid intercrystalline corrosional disintegration takes place. Whereas incandescence at 1200-1500° over thousands of hours does not produce either an increase or a loss in weight, 30-50 hours oxidation at 500° will reduce the disilicide

Card 1/3

to powder (except under a shielding atmosphere). Mo disilicide is termed brittle and of medium hardness. Compressive strength at room temperature is 70 kg/mm^2; bending strength at 1200° is 37 kg/mm^2; 100-hour strength at 1100°C is 6.3 kg/mm^2 (all three values from Western sources). It is high-temperature plastic; creep strength at 1000° is termed unsatisfactory. If Mo disilicide is to be employed, e.g., in gas-turbine parts, cementing substances must be found that will enhance its toughness and strength. Unfortunately, attempts to produce sintered combinations of $MoSi_2$ with various metals have not been successful. The $MoSi_2$ for the subject experiments (work done in 1952-3) was made of powdered Mo (grains up to 3μ) with 0.005% Fe, 0.002% Ni, 0.03% O_2, and of thoroughly ground Si (2 μ) with 0.08% Al, 0.03% Ca, 0.015% Mg, 0.015% Fe. The two powders, taken in stoichiometric ratio (63.14% Mo, 36.86% Si), were thoroughly mixed in alcohol for 48 hours. Cylindrical specimens 50x25 mm were sintered from this mixture at 1100-1200° (3-5 min holding). The special graphite pressing dies were compressed at 150 kg/cm^2. The $MoSi_2$ formation is fast and complete; the fracture of the specimen is steel-gray in color with a metallic gloss. The specimen surface forms a thin carbide crust in contact with the graphite. The results of three chemical analyses are tabulated. The $MoSi_2$ was once more ground to a fine powder (grain size 2 μ) and subjected to a second sintering at 1500-1550° into 6x6x60-mm rectangular rods. The unit weight increased to 6.11-6.13 g/cm^3 owing to reduced porosity. X-ray analysis reveals only a single phase with tetragonal lattice; parameters: a = 3.2 Å and c = 7.86

S/736/60/000/002/00?/00?

AUTHORS: Brokh[illegible] Plat[illegible]

TITLE: Som[illegible] high-temperature [illegible] mechanical properties [illegible] compo[illegible] of Al_2O_3 [illegible] hard alloys

SOURCE: Vses[illegible] nauchno-issledovatel'skiy institut tverdykh splavov. Sbornik trudov, no. 2. Moscow, 1960. Tverdyye splavy. pp. 1?3-12?

TEXT: This is a laboratory test report on high-temperature hardness and bending-strength tests on a large number of specimens of the Soviet ЦМ-332 (TsM-332) oxide ceramic based on sintered Al_2O_3 ("mineraloceramic," "corundum microlith") which were first developed at the Moscow Institute of Chemical Technology imeni D.I. Mendeleyev and which are being produced industrially by the Moscow Hard-Alloy Kombinat (cf. Kitaygorodskiy, I.I., Pavlushkin, N.M., Steklo i keramika, no. 11, 1955; also, "Mineralokeramicheskiy instrumental'nyy material TsM-332 - The mineraloceramic tool material TsM-332," Metallurgizdat, 1957). TsM-332 is prepared from technically pure [illegible] with 0.5% MgO mineralizer additive; sintering temperature ~1700°. Grain size: 1-3 μ, with little porosity; weight: 3.9 g/cm³. Microphotographs of unetched and etched sections are shown. The present hardness tests were conducted at temperatures of up to 1100°C and bending

Card 1/4

tests up to 1100°C, along with comparison tests on USSR hard alloys. The high-
temperature H_V hardness was determined on a special vacuum ($10^{-?}$ mm Hg) [illegible]
ВИМ-1М (VIM-1M) with diamond-pyramid indenters with a 136° angle between edges.
Test load 1 kg; tests were made on a polished specimen 15 mm dia and 5 mm high.
Three or more specimens were tested at each temperature up to 1100° with 6-7
indentations per specimen. Temperature soaking: 20 min; indentation time under
load: 30 sec. Tests were performed during temperature reduction. After cooling
to room temperature 420 x photographs were made, and the indentation diagonals
were measured for the H_V determination. A nearly straight line of Vickers hard-
ness vs. temperature, ranging from H_V=1800 kg/mm² at 20°C to H_V=360 kg/mm²
at 1100°C, was found and graphically compared to referenced Soviet data by Betaneli
and Kazakov. Indentation photographs reveal thin branching fissures at the corners
of the indentations, indicating brittleness up to the highest test temperatures. Rock-
well tests (scale A, load 60 kg) on the same specimens resulted in even more pro-
nounced radial cracks. Microhardness tests of the TsM-332 ceramic on the ПМТ-3
(PMT-3) instrument at room temperature and with a 100-g load yielded a hardness
of 1900-2000 kg/mm², i.e., 100-200 kg/mm² higher than the Hv, and without evi-
dence of corner microfissures in the indentations. High-temperature bending tests
were performed on 5x5x40-mm specimens on the universal Р-5 (R-5) testing machine
with a simple testing span of 30 mm. As in all tests of brittle materials, the data

Card 2/4

scatter is appreciable; inasmuch as the scatter distribution obeys the law of normal random-error distribution, the data are analyzed by the methods of mathematical statistics. The bending strength was determined from the weighed mean of the batches of specimens. Results are tabulated and graphically portrayed; a near-straight-line variation goes from 32.7 kg/mm^2 at 20°C to 28.7 kg/mm^2 at 800°C, followed by a curve through 23.6 kg/mm^2 at 1000° and 13.5 kg/mm^2 at 1200°, with a scatter of ~10% from 20 to 900°, rising to 17.3% at 1200°; B.P. Pribylov reports 8 kg/mm^2 at 1300°. A comparison with Pribylov's data on hard alloys BK (VK) and TK (TK) (Mekhanicheskiye svoystva tverdykh splavov - The mechanical properties of hard alloys. Izd. Doma inzhenera i tekhnika imeni Dzerzhinskogo, 1955) shows that, while hard alloys are stronger at room temperature, the TsM-332 ceramic loses strength more slowly with rising temperature, especially beyond 700-800°, so that beyond 1200°C the strength of TsM-332 exceeds that of the plastically deformable hard alloys. Tension tests of plane, symmetrically (concavely curvilinearly) tapered, specimens encountered difficulties attributable to irregular shrinkage (18-20%) which rendered the specimen geometry somewhat uncertain; the observed tensile strength amounted to 15-16 kg/mm^2. Compression tests were made on 10-mm dia and 15-mm high cylindrical specimens with hard-alloy support blocks, which minimized specimen-support-block compenetration and frictional constraint of the specimen ends. Data scatter: 20%. Mean compressive strength of 80-90 kg/mm^2 is lower than that reported in the literature. High-temperature hardness tests on the TsM-332 are compared with simultaneously performed tests of standard TiW alloys T5K10, T14K8, T15K6, T30K4, and T5K6, the new WCo alloys BK6B (VK6V), BK8B (VK8V), and BK15B (VK15V) with large-grain microstructure (mean WC-phase grain size 3-5 μ), and the BK6M (VK6M) extrafine-grain alloy (WC-phase grain size ~1 μ) prepared by intensified wet grinding. Data on all of the tests are tabulated and graphed. The H_V of all alloys decreases to 250-400 kg/mm^2 at 1000°C. TiC and Co alloys have substantially parallel curves; H_V increases with increasing TiC and Co. In the WCo alloys a similar effect of Co is observed, except for one high-Co alloy, BK15 (VK15). The fine-grain alloy BK6M (VK6M) has a more shallow decrease in H_V up to 600° than the analogous coarse-grain alloy BK6B (VK6V), but at higher temperatures the decrease is so steep that the H_V at 1000° is the same for both alloys. Diamond-pyramid indentations in the TK (TK) and BK(VK) alloys are free of fissuration in the corners; their microbrittleness is significantly smaller than that of TsM-332. In summary: At the highest temperatures tested, the strength and hardness of sintered Al-oxide ceramics was found to be greater than that of sintered metallic hard alloys. This advantage, however, is achieved at the cost of an increased microbrittleness. There are 15 figures, 3 tables, and 11 references (7 Russian-language Soviet, 1 Russian-language translation of the German book on hard alloys by R. Kieffer and P. Schwarzkopf, and 3 German).

ASSOCIATION: None given.

S/736/60/000/002/006/007

AUTHORS: Brokhin, I.S., Ol'khov, I.I., Ashmarin, G.M., Baranov, A.I., Platov, A.B., Repkin, V.P.

TITLE: The high-temperature strength of sintered titanium-carbide hard alloys.

SOURCE: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov. Sbornik trudov. no.2. Moscow, 1960. Tverdyye splavy. pp.135-147.

TEXT: Following a review of recent Western progress in the manufacture of heterogeneous carbide alloys sintered with Co, Ni, Ni-Cr, and other cementing binders, and more especially the Austrian WZ and the U.S. "Kanthanium" alloy (cf. Harwood, //no initials//, Materials and Methods, v.36, no.2, 1952), with reference to the manufacture of gas-turbine blades, the brittleness and thermal-shock sensitivity of such alloys is criticized. The authors experimented with sintered TiC-NbC and TiC-WC alloys cemented with pure Co powder from 1950 through 1953. Short-term and 100-hour strength tests were made at room temperature and temperatures up to 1200°C. For details on the source materials, cf. the paper by I.S. Brokhin and I.I.Ol'khov on p.148 of this compendium (Abstract S/736/60/000/002/007/007); the compound carbides were obtained by the calcining of a mixture of finely-ground powders of the simple carbides at 2000-2200°. Test specimens comprise (a) TiC-NbC-Co with 3 to 30% NbC and 10 to 40% Co, and (b) TiC-WC-Co with 15 to 35% WC and 10 to 25% Co. Bending-strength test specimens were

Card 1/3

prismatic, 5x5x40 and 6x6x50 mm. Tests up to 1000°C were made on a special Silit-resistor-heated accessory (cross-section shown) installed on the P-5 (R-5) universal testing machine. The specimen was supported as a simple beam on hard-alloy or sintered aluminum-oxide supports with a 30-mm span and was subjected to a ball-centered load advancing at a rate of 11 mm/min. A PtRh-Pt contact thermocouple measured the temperature; mean results were taken from no less than 15 specimens. The tensile-strength test specimens had the shape proposed by Prof. S. V. Sörensen (Russian transliteration "Serensen"); they were 120 mm long, 7 mm thick, 21.2 mm wide at the ends, and had a 20° inward straight taper for 26.2 mm from the ends and a R=194.5 mm circular fairing between the tapers to arrive at a 40 to 45 mm^2 neck section at the center. Precise dimensions were obtained by boron-carbide rubbing of the sintered specimens. Only the central 20 mm of each specimen were brought to the test temperature (15-20 min heating, 20-min holding), while the asbestos-padded hinge-clamped ends remained outside the furnace. During the 1200° tests, the upper end did not exceed 800-900°, the lower end 700-800°. Tests in which rupture occurred outside of ± 5 mm from the midpoint of the specimen were not included in the evaluatio . A structural cross-section and a general-view photograph of the testing machine, the ПМ-1350 (PI-1350) tubular Pt heater (manufactured by the "Platinopribor" factory), and its installation on the ДСТ-5000 (DST-5000) creep tester are shown. Room-temperature tension-data scatter was 12-15%, as against 10-12% at high temperature. The bending-data scatter was

10-12% and 7-10%, respectively. TiC-NbC-Co alloys: 10-15% NbC increases the scale resistance of TiC alloys by some 150-200°C, but engenders some loss in strength. In TiC-NbC-Co alloys a Co content from 10-40% was tested (with 10-15% NbC); maximum strength in bending occurred at 25-30% Co. Tests with a 25% Co content and 3 to 30% NbC contents showed a nearly constant bending strength (~90 kg/mm^2) up to 12-13% NbC, followed by a significant drop-off at NbC contents up to 20%. The bending strength of an alloy with 15% NbC and 25% Co (optimal scale resistance) increased steadily from 80 to 90 kg/mm^2 from 20 to 700° (attributed to plasticity), then dropped to 65 kg/mm^2 at 1000°. The tensile strength of the same alloy decreases in a straight line from 34 kg/mm^2 at 950° to 13 kg/mm^2 at 1200°. 100-hour tests indicate that the alloy retains high-temperature strength only up to 1000°. TiC-WC-Co alloys: The scale resistance of the W-containing alloys is lower than that of the Nb-containing alloys. Variations in WC content from 15 to 30% and in Co from 10 to 23% do not affect the strength of the TiC-based alloys appreciably. The σ_b-vs.-T curves of the 10% Co and the 25% Co alloys cross over at 800° and 80 kg/mm^2, and at higher T up to 1000° the 10% Co alloy is stronger than the 25% Co alloy. The tensile strength of the 30% WC, 15% Co, 55% TiC alloy descends linearly from 40 kg/mm^2 at 950° to 12 kg/mm^2 at 1200°. 100-hr tensile tests indicate a high-T strength limit of only 900°. Summary: TiC-WC-Co alloys are stronger ($E = 38\text{-}40 \cdot 10^3$ kg/mm^2) but less high-T resistant ($T_{max}/100$ hr$=900$°C) than TiC-NbC-Co ($E = 30.5\text{-}31.5 \cdot 10^3$ kg/mm^2; $T_{max} = 1000$°). There are 13 figures and 7 refs. (3 English-language and 4 German)

Card 3/3

ASSOCIATION: None given.

36755

S/081/62/000/001/032/067
B151/B101

15.2400

AUTHORS: Brokhin, I. S., Ol'khov, I. I.

TITLE: Scale stability of metalceramic solid alloys based on titanium carbide

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 306, abstract 1I182 (Sb. tr. Vses. n.-i. in-t tverdykh splavov, no. 2, 1960, 148-157)

TEXT: A study of the scale-stability of 3 series of experimental metal ceramic solid alloys based on TiC at temperatures up to 1200°C has shown that in the TiC-NbC-Co series the optimum effect is given by an alloy containing 15% NbC and 25% Co, the rest of the alloy being TiC. Its scale-stability is considered to be satisfactory at temperatures up to 1100°C. Among the TiC-WC-Co alloys the best is one containing 30% WC; 15 - 20% Co, the rest being TiC. The scale-stability of this alloy is considered to be satisfactory up to 900°C. [Abstracter's note: Complete translation.]

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Card 1/1

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S/136/60/000/04/017/025
E091/E235

AUTHORS: Brokhin, I. S., Ol'khov, I. I., Ashmarin, G. M., Baranov, A. I., Platov, A. B., and Repkin, V. P.

TITLE: Heat Resistance of Titanium Carbide-Base Cermets

PERIODICAL: Tsvetnyye metally, 1960, Nr 4, pp 67-70 (USSR)

ABSTRACT: In this paper, the results of an investigation of the refractoriness of Ti-Nb and Ti-W base alloys produced by powder metallurgy methods (carbide solid solutions) with Co as binder are reported. The influence of the NbC, WC and the binding metal on the mechanical properties of TiC alloys has been studied at room temperature and at elevated temperatures in short-term and long-term tests. The experimental alloys were made by methods generally used for the manufacture of titanium carbides. The complex carbides TiC-WC, TiC-NbC and pure powdered cobalt were used as the starting materials. The complex carbides were prepared by water quenching a mixture of fine powders of the respective simple carbides from 2000 to 2200°C. In the TiC-Nb-Co alloys, the NbC content was varied from 0 to 25% and the Co content from 5 to 40% (remainder TiC), and in the TiC-WC-Co alloys, the WC content was varied from 15 to 35% and the Co

Card 1/5

69382

S/136/60/000/04/017/025
E091/E235

Heat Resistance of Titanium Carbide-Base Cermets

content from 10 to 25%. The elastic limit in bending was determined for prismatic specimens, 5 x 5 x 40 and 6 x 6 x 50 mm. Bend testing at high temperatures was carried out in a specially constructed device with a silicon carbide heater which was attached to an R-5 universal testing machine. The specimen was placed on supports made of a heat resisting carbide and fractured with a concentrated load; the distance between the supports was 30 mm and the speed of loading was 11 mm/minute. The temperature was measured by a Pt/Pt-Rh thermocouple, the junction of which was in direct contact with the specimen. For the determination of the UTS in tension and the long term refractoriness, flat radiused specimens, as proposed by S. V. Serensen, were used. The main feature of the high temperature testing of these specimens (Fig 1) is the fact that up to a given maximum temperature only the central "working" portion of the specimen is heated; the ends of the specimen which are fixed in grips are outside the hot zone of the furnace. The temperature of the "cold" ends

69382
S/136/60/000/04/017/025
E091/E235

of the specimen does not exceed 800 to 900°C in the case of the upper, and 700 to 800°C in the case of the lower ends. The electric furnaces with a single piece tubular platinum heater, type P.I-1350, enable lengthy tests to be carried out at temperatures of up to 1350°C. The furnace is attached to the creep testing maching DST-5000, which has been specially reconstructed for testing cermet specimens and has been re-equipped with electrical gear registration and regulation apparatus (potentiometers). Damping asbestos packing was inserted under the supporting surfaces of the side faces of the specimen adjoining the grips. The temperature was measured with the Pt/Pt-Rh thermocouple passing through an orifice in the solid platinum heater; the junction was placed within 0.5 to 1 mm of the central portion of the specimen. Short term tests to fracture at high temperatures were carried out with the same machines and attachments as the long term (100 hours) tests. Fig 2 shows the UTS in bending of TiC-NbC-Co (10 to 15% NbC) alloys in relation to cobalt content (1 - at 20°C; 2 - at 1000°C). Fig 3 shows the UTS in bending of TiC-NbC-Co (25% Co) alloys in relation

09302

S/136/60/000/04/017/025
E091/E235

to NbC content. Fig 4 shows the change in UTS on straining a TiC-NbC-Co alloy in relation to temperature. Fig 5 shows the UTS in bending of TiC-WC-Co alloys containing 30% WC at 10 and 23% Co, in relation to temperature (1 - 10% Co; 2 - 23% Co). Fig 6 shows the change in UTS in tension of a TiC-WC-Co alloy of the basic composition (65 : 35) + 15% Co, in relation to temperature; Fig 7 shows the limiting long-term (100 hours) refractoriness of a TiC-WC-Co alloy of the original composition (1 - 950°C; 2 - 1100°C). For the investigated cermets, the relationship $\sigma_b / \sigma_{bending} \approx 1 - 2$ (approximately 50%) is characteristic. The specific gravity of the TiC-NbC-Co alloys is 5.9 to 6.2 g/cm^3 and that of the TiC-WC-Co alloys is 6.5 to 7 g/cm^3. For the determination of the modulus of elasticity of the experimental alloys, the angle of bend under various loads was measured directly and from that, the value of E was calculated by a well known formula. The specimens were plates 0.3 to 0.5 mm thick, made by compressing and sintering plates of 1 mm thickness and subsequently grinding with boron carbide. The tests were carried out at room temperature in a device made

69382

S/136/60/000/04/017/025
E091/E235

Heat Resistance of Titanium Carbide-Base Cermets

by B. I. Pribilov. The specimens were placed on refractory supports and loaded gradually with loads of 50 to 1000 g. The degree of bending was measured with a micrometer. For TiC-NbC-Co alloys, E was found to be 30 500 to 31 500 kg/mm^2, and for TiC-WC-Co alloys, 38 000 to 40 000 kg/mm^2. There are 7 figures and 3 references, 2 of which are Soviet and 1 German.

ASSOCIATION: VNIITS

Card 5/5

Fraiman, A. A.

of certain titanium nitride

SOURCE: Poroshkovaya metallurgiya, no. 7, 1965, 34-40

TOPIC TAGS: titanium nitride cermet, molybdenum containing cermet, cermet corrosion

ABSTRACT: Optimal conditions were selected for the preparation of powdered titanium ... conditions for the preparation of dense ... containing ... were also determined; the method used ... structure and phase ... investigated ... the given ... tests ... corrosion curves were plotted ...

Card 1/2

ACCESSION NR: AP5018271

and time dependence) Compositions containing the minimum amount of molybdenum ... highest resistance to scaling. "The method ... [illegible]

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All-... Institute of Hard Alloys)

Card 2/2

L 62707-65 EPF(c)/EPF(n)-2/EPA(s)-2/EPA(w)-2/EWA(c)/EWT(m)/EWP(i)/EWP(b)/T/EWP(e)/

AUTHOR: Brokhin, I. S.; Platov, A. B.

TITLE: Al_2O_3-Mo and ZrO_2-Mo cermets and their structure

SOURCE: Poroshkovaya metallurgiya, no. 7, 1965, 74-79

TOPIC TAGS: cermet, molybdenum base cermet, dispersion strengthened alloy, molybdenum alloy, aluminum oxide containing alloy, zirconium oxide containing alloy

ABSTRACT: Cermets composed of molybdenum and 5—70% aluminum or zirconium oxide can be produced either by hot compacting at 1670—1700C under [illegible] pressure or by cold compacting under 120—125 dan/cm^2 pressure, followed by two-stage sintering, first at 1100C and then at 1700C. The density of specimens produced by either of these procedures was approx. 94—98%, and efforts to obtain [illegible] was unsuccessful. Both cermets consisted of two phases: molybdenum and aluminum or zirconium oxides. The grain size of components in the structure of [illegible] sintered specimens was larger than that of hot-compacted specimens. [illegible] networks, ceramic and metallic, were observed in the structure. [illegible] cal interaction were observed. The hardness of Al_2O_3-Mo cermets [illegible] with increasing the Al_2O_3 content. Orig. art. has: [illegible] figures [illegible]

Card 1/2

L 62707-65

ACCESSION NR: AP5018276

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ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov, Moscow (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: 15Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 006 ATD PRESS: 4064

Card 2/2

DOGADKIN, B.A.; ZACHESOVA, G.N.; ABRAMOVA, Ye.N.; BROKHIN, Yu.N.

Aqueous dispersions of polyethylene. Koll. zhur. 25 no.4: 427-430 Jl-Ag '63. (MIRA 17:2)

BROKHOVETSKIY, B.

Watching over the work of machine industry workers. Okhr. truda i sots.strakh. 5 no.1:11-14 Ja '62. (MIRA 15:2)

1. Zaveduyushchiy otdelom okhrany truda Volgogradskogo obkoma profsoyuza rabochikh mashinostroyeniya.
(Volgograd--Machinery industry--Hygienic aspects)

BROKHOVICH, A. I.

Conservative surgery of the stomach in peptic ulcer. Trudy LSGMI 20:152-163 '54. (MIRA 10:8)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta, zav. kafedroy - zasl. deyatel' nauki, prof. A.Yu.Sozon-Yaroshevich i khirurgicheskoye otdeleniye bol'nitsy zavoda im. Frunze, glavnyy vrach - V.V.Ashkov.

(PEPTIC ULCER, surgery, conservative)

BROKHOVICH, A.I.

Technic of stump management following gastric sesection in peptic ulcer. Trudy LSGMI 39:303-311 '58. (MIRA 12:8)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii Leningradskogo sanitarno-gigiyenicheskoy meditsinskogo instituta (zav.kafedroy - z.d.n., prof.A.Yu.Sozon-Yaroshevich [deceased]).
(GASTRECTOMY,
stump management in peptic ulcer (Rus))

BROKHOVICH, A.I., dotsent

Secretory activity of the stomach in parathyroid insufficiency. Trudy LSGMI 59:222-234 '60. (MIRA 14:9)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav. kafedroy - prof. K.A.Grigorovich).
(PARATHYROID GLANDS--DISEASES) (STOMACH--SECRETIONS)

BROKHOVICH, A.I., dotsent

Changes in the venous pressure and state of the peripheral vessels of the skin in experimental plastic replacement of magistral arteries in extremities. Trudy LSGMI 74:301-309 '62. (MIRA 17:10)