SOV/126-[illegible] 4-[illegible]

Effect of Phosphorus and Arsenic on the Lattice Parameter and Hardness of α-Iron

45 and 10 hrs at 400, 500, 650 and 810°C)
From these data solid solubility of P and As in α-iron at various temperatures was determined. The [illegible] solubility curve of phosphorus in α-iron is shown in Fig.3, that showing solubility of arsenic in α-iron is reproduced in another article (Ref.12). Both phosphorus and arsenic were found to increase hardness of α-iron. The micro and macro-hardness curves (graphs a and b) for the Fe-P and Fe-As Alloys are shown on Fig.4 and 5 respectively. The difference between the values of micro and macro-hardness are attributed to the fact that the [illegible] was [illegible]. The

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SOV/126-6-4-13/34

Effect of Phosphorus and Arsenic on the Lattice Parameter and Hardness of α-Iron

on cold-worked and the latter on annealed specimens. There are 5 figures and 12 references of which 2 are Soviet, 4 English, 3 German, 1 Ukrainian and 2 Norwegian.

ASSOCIATION: Institut Metallofiziki AN USSR (Institute of Metal Physics, AS UkrSSR)

SUBMITTED: 26th September 1957.

Card 4/4

Par, V.M.

18(4,7); 25(1) PHASE I BOOK EXPLOITATION SOV/2306

Akademiya nauk Ukrainskoy SSR. Institut metallofiziki

Voprosy fiziki metallov i metallovedeniya (Problems in the Physics of Metals and Metallography) Kiyev, Izdo-vo AN Ukrainskiy SSR, 1959. (Series: Its: Sbornik nauchnykh rabot, Nr 9) Errata slip inserted. 3,000 copies printed.

Ed. of Publishing House: V.L. Shkurko; Tech. Ed.: M.I. Yefimova; Editorial Board: V.N. Svechnikov, Academician, Academy of Sciences, Ukrainian SSR (Resp. Ed.); S.D. Gertsriken, Doctor of Physical and Mathematical Sciences; and I.Ya. Dekhtyar, Doctor of Technical Sciences.

PURPOSE: This collection of articles is intended for scientific workers, aspirants, and engineers in the fields of the physics of metals, metallography, and metallurgy. It may also be useful to students of advanced courses in metallurgical and physical faculties.

COVERAGE: This collection of articles deals with the following topics: effect of high-speed heating, heat treatment, deformations, and crystallization conditions on phase transformations, structures, and properties of metals and alloys; the effect of additional alloying components on volumetric and intercrystalline diffusion in alloys; and the effect of repeated quench hardening and radioactive and ultrasonic treatment on the physical properties of alloys. No personalities are mentioned. References follow several of the articles.

SVECHNIKOV, V.N.; KOCHERZHINSKIY, Yu.A.; PAN, V.M.; MAYSTRENKO, Ye.Ye.; SHURIN, A.K.

Investigating the chromium - niobium - vanadium system. Issl. po zharopr.splav. 4:248-246 '59. (MIRA 13:5)
(Chromium-niobium-vanadium alloys)

SVECHNIKOV, V.N. [Sviechnikov, V.M.], akademik; PAN, V.M.

Transformations in a chromium - nickel system. Dop.AN URSR no.7: 917-920 '60. (MIRA 13:8)

1. Institut metallofiziki AN USSR. 2. AN USSR (for Svechnikov).
(Chromium-nickel alloys)

SVECHNIKOV, V.N. [Svechnykov, V.M.], akademik; PAN, [illegible].V.M.

Phases of the system chromium - nickel - niobium. Dop.AN URSR no.5:634-637 '60. (MIRA 13:7)

1. Institut metallofiziki AN USSR. 2. AN USSR (for Svechnikov).
(Systems (Chemistry))

SVECHNIKOV, V.N.; PAN, V.M.

Investigating the ternary system chromium - nickel - niobium. Issl. po zharopr. splav. 6:240-250 '60. (MIRA 13:9)
(Chromium-nickel-niobium alloys--Metallography)
(Phase rule and Equilibrium)

PHASE I BOOK EXPLOITATION SOV/4302

Akademiya nauk SSSR. Nauchnyy sovet po problem zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, tom 6 (Investigations of Heat-Resistant Alloys, Vol. 6) Moscow, 1960. 319 p. Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova. Nauchnyy sovet po problem zharoprochnykh splavov.

Editorial Board: I. P. Bardin (Deceased) Academician, I. V. Kurdyumov, N. V. Agayev, Corresponding Member, Academy of Sciences USSR (Resp. Ed.), I. A. Oding, I. N. Pavlov, and I. P. Zudin, Candidate of Technical Sciences; Ed. of Publishing House: V. A. Klimov; Tech. Ed.: S. G. Tikhomirova.

PURPOSE: This book is intended for research workers in the field of physics of metals and for metallurgists, particularly those working on heat-resistant alloys.

COVERAGE: This collection of 45 articles deals with various problems in the production of heat-resistant alloys. Special attention is paid to the mechanisms of deformation of such metals as aluminum, copper, iron, and nickel. Various defects and failures of metals are analyzed, and means for increasing the heat resistance and plasticity are described. Among the special problems discussed are: electrolytic conductivity of iron-aluminum alloys in the solid state; the mobility of atoms in aluminum alloys, depending upon defects of their crystalline structure; the kinetics of change in isolated pores; the irreversible thermal transformation of solid bodies, etc. No personalities are mentioned. References follow each article.

28705

18.1152 1418 2208 1045 1530

S/021/61/000/003/011/013
D274/D301

AUTHOR: Pan, V.M.

TITLE: More precise phase diagrams of the systems Cr-Nb and $NbCr_2$-Ni_3Nb

PERIODICAL: Akademiya nauk UkrSSR. Dopovidi, no.3, 1961, 332-334

TEXT: It was found that, in the solid state, the system chromium-niobium undergoes two transformations. The system $NbCr_2$-Ni_3Nb was studied by the author in an earlier work (Ref. 8: V.M. Svyechnikov & V.M. Pan, DAS UkrSSR, 634, 1960). In this system, a eutectic transformation was observed at 1260°C and 55 weight % Ni, as well as a broadened β-phase. A more detailed investigation of the systems Cr-Nb and $NbCr_2$-Ni_3Nb, carried out by the methods of differential thermal analysis and microstructural and X-ray analysis, led to more precise and more complete phase diagrams. It was established that $NbCr_2$ is transformed, at temperatures above 1590°C, into a

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S/021/61/000/003/011/013
D274/D301

More precise phase diagrams...

high-temperature modification which has a crystalline structure of $MgZn_2$-type, i.e. hexagonal with 12 atoms per unit cell. On the phase diagram of the binary system chromium niobium, this modification forms a single-phase region ε. Two transformations occur (in the solid state) in the system chromium-niobium: a eutectoid transformation $\varepsilon \rightleftharpoons \alpha + \beta$ at 1585°C and approximately 47 weight % Nb, and a peritectoid transformation $\varepsilon + \gamma \rightleftharpoons \beta$ at 1625°C and 49-50 weight % Nb. The temperatures of eutectic transformations were also rendered more precise. It was established that the eutectic $J \rightleftharpoons \alpha + \varepsilon$ is at 1640°C and 30 weight % Nb. The melting point of $NbCr_2$ was found to be 1720°C. If nickel is dissolved in $NbCr_2$, the temperature of the polymorphic transformation decreases sharply. An admixture of 5 weight % Ni, for example, lowers the $\beta \rightarrow \varepsilon$ transformation temperature from 1590° to 900°C. As a result, a wide single-phase region ε is formed in the system $NbCr_2$-Ni_3Nb, i.e. a $Nb(Cr,Ni)_2$-phase of different composition and $MgZn_2$-type structure. The lattice parameters of the ε phase were calculated for alloys with various Ni-content, tempered at 1100°C. These para-

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30457

S/126/61/012/003/018/021
E073/E335

52610
18 9200

AUTHOR: Pan, V.M.

TITLE: Polymorphous transformation in the intermetallide $NbCr_2$

PERIODICAL: Fizika metallov i metallovedeniye, v. 12, no. 3, 1961, 455 - 457

TEXT: This communication is devoted to investigating the ternary system Cr-Nb-Ni. The alloys were produced from electrolytically-refined Cr (99.95% purity), Nb in rods (99.97 and 99.4% purity) and Ni of 99.99% purity, in a laboratory arc furnace with a water-cooled copper bottom and a tungsten electrode, in an atmosphere of purified nitrogen. Altogether 19 alloys of the system Cr-Nb and 13 alloys located on the quasi-binary section $NbCr_2$-Ni_3Nb of the Cr-Nb-Ci system were tested. The investigations were by the method of differential thermal analysis. Micro- and X-ray-structural analyses were also made of alloys annealed at 1 100 °C for 107 hours and then quenched from 800 and 1 140 °C. It was found that in ternary alloys with a composition approaching that of the intermetallide $NbCr_2$

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30457
S/126/61/012/003/018/021
E073/E335

Polymorphous transformation ....

containing over 3 - 5% Ni, the β-phase with a lattice of the $MgCu_2$ type ceases and, instead, an ε-phase with a lattice of the type $MgZn_2$ appears, i.e. a hexagonal lattice with 12 atoms in the elementary cell. According to differential thermal analysis and phase X-ray structural analysis of alloys quenched from various temperatures, the phase diagram of the quasi-binary system $NbCr_2$-Ni_3Nb is as shown in Fig. 1 (contents given in wt.% - "Ж" = liquid). From this the conclusion is drawn that the intermetallide $NbCr_2$ crystallises from the liquid at 1 720 ± 5 °C, whilst in the range 1 720 - 1 590 °C it exists in the form of the modification with the lattice of the type $MgZn_2$. At temperatures between 1 590 °C and room temperature, the intermetallide $NbCr_2$ exists in the other modification with a $MgCu_2$-type lattice. These as well as previously published data enabled plotting a more accurate state diagram - Fig. 2: top scale - at.% Nb, bottom scale - wt.% Nb; "Ж" = liquid.

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S/126/61/012/003/018/021
E073/E335

Polymorphous transformation ....

This diagram confirms the presence of two eutectic transformations: between the solid solution of Nb in Cr and the intermetallide $NbCr_2$ at 1 640 °C and 30% Nb, and between the solid solution of Cr in Nb and the intermetallide $NbCr_2$ at 1 660 °C and 65% Nb. Invariant transformations were detected in the alloys in the solid state which are associated with the polymorphism of the intermetallide $NbCr_2$. In the high Cr section of the diagram, the horizontal at 1 585 °C corresponds apparently to the eutectic transformation $\varepsilon \rightleftarrows \alpha + \beta$; in the high Nb section of the diagram the horizontal at 1 625 °C appears to correspond to the peritectic transformation $\varepsilon + \gamma \rightleftarrows \beta$. The narrow concentration intervals of the phase ranges ε, β and $\varepsilon + \beta$ impede the accurate determination of the boundaries of these regions. However, it can be stated that the width of the single-phase ε region in the binary system does not exceed 1.5%, that the eutectoidal point does not differ by more than 0.2 - 0.3% from the boundary of the single-phase β range and that the peritectic point is only about 1% from

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S/126/61/012/003/018/021
Polymorphous transformation E073/E335

the boundary of the ε range. A differential thermal curve recorded for an alloy containing 40% Nb and 60% Cr shows that complete fusion occurs at 1 705 °C and the beginning of crystallisation occurs at 1 690 °C. The lattice parameter of the high-temperature modification of the $NbCr_2$ compound was determined at a = 9.92 kX, c = 8.10 kX. If the Ni content exceeds 35%, the parameters of the lattice phase ε will not depend on concentration and, consequently, at 1 100 °C the solubility of Ni in the ε-phase is 36%. According to R.P. Elliot and W. Rostoker (Ref. 7 - Trans. ASM, 1958, 50, 617) transition from the $MgCu_2$-type to the $MgZn_2$-type structure for the Laves phase is accompanied by a decrease in the electron concentration below the critical level of 2.32. Ni additions bring about a sharp decrease in the concentration of valency electrons on the atom in the $NbCr_2$ phase. This conclusion is in agreement with the data of Elliot and Rostoker on the low effective valency values during formation of Laves phases. Assuming that the effective

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S/126/61/012/003/018/021
E073/E335

Polymorphous transformation ....

valencies of Cr and Ni are, respectively, 1.69 and 0.25 and that at 1 100 °C the boundary of the single-phase β range corresponds to 4.5 at.%, the effective valency of Nb is 3.80. There are 4 figures and 9 references: 6 Soviet-bloc and 3 non-Soviet-bloc. The three English-language references mentioned are: Ref. 1 - P. Duwez and J. Martens, J. Metals, 1952, 4, 72; Ref. 2 - O. Kubaschewski and A. Schneider - J. Inst. Metals, 1948-49, 75, 403; Ref. 7 - quoted in text.

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of Physics of Metals of the AS UkrSSR)

SUBMITTED: October 3, 1960

Card 5/6

29178
S/021/61/000/010/005/008
D251/D303

18.9200 1418 1454 1521

AUTHORS: Svyechnikov, V.M., Academician AS UkrSSR, and Pan, V.M.

TITLE: Phase diagram of the system Cr-Ni-Nb

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 10, 1961, 1292 - 1295

TEXT: By constructing a complete diagram of the phase-equilibrium of the system Cr-Ni-Nb with the quadrangle Cr-Ni-Ni_3Nb-$NbCr_2$, it is shown that there is a 4-phase peritectic equilibrium at 1175 $\pm 5^o$, a 4-phase eutectic equilibrium at 1173 $\pm 5^o$, and a 4-phase peritectoid equilibrium at 1160 $\pm 5^o$. In the part of the system Cr-Ni-Nb bounded by the Cr-Ni-Ni_3Nb-$NbCr_2$ quadrangle there is only one quasi-binary section $NbCr_2$-Ni_3Nb. In the case of a nickel content of over 5 - 7 % it was found that the phase of solid solution in the low-temperature modification of $NbCr_2$ vanished and was replaced by the

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PAN, V. M., Cand. Tech. Sci. (diss) "Diagram of Phase Equilibira of Khrome-Nickel-Niobium System," Kiev, 1951, 1[illegible] pp. (Kiev [illegible] Tech. Inst.) [illegible] copies (KL Supp 1[illegible]-51, 27[illegible]).

PAN, V.M.

Definition of phase diagrams of Cr - Nb and $NbCr_2$ - Ni_3Nb systems [with summary in English]. Dop.AN URSR no.3:332-334 '61. (MIRA 14:3)

1. Institut fiziki metallov AN USSR. Predstavleno akademikom AN USSR V.N.Svechnikovym.
(Chrome—Niobium alloys)

PAN, V.M.

Polymorphic transformations in the $NbCr_2$ intermetallide.
Fiz. met. i metalloved. 12 no.3:455-457 S '61. (MIRA 14:[illegible])

1. Institut metallofiziki AN USSR.
(Chromium-niobium alloys--Metallography)
(Phase rule and equilibrium)

S/123/62/000/016/007/012
A004/A101

AUTHORS: Kocherzhinskiy, Yu. A., Pan, V. M.

TITLE: Connection between the hardness of hardened steel and the special features of phase transformations in high-speed electric heating

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 16, 1962, 27, abstract 16B146 ("Sb. nauchn. rabot In-ta metallofiz. AN USSR", 1961, no. 12, 111 - 116)

TEXT: У 8 (U8) grade steel specimens 1.7 mm in diameter were investigated, having an initial structure of lamellar pearlite. For hardening the Seta Sakui system was used. The electric resistance of the specimens was measured before and after hardening. The cooling rate of the specimens in water reached 10,000 degree/sec, which ensured an abrupt hardening (the heating rate attained 1,000 degree/sec). Kinetic curves of the $\alpha \rightarrow \gamma$ transformation were plotted in the course of the work according to data of the dilatometric investigation, while also the dependence of the change in phase composition and hardness of the hardened specimens on the heating time was obtained. As a result of the work it was found that the maximum hardness corresponds to the termination of the $\alpha \rightarrow \gamma$ transformation at an incomplete

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S/659/62/008/000/006/028
I048/I248

AUTHORS: Svechnikov, V.N., and Pan, V.M.

TITLE: Phase diagrams for the systems chromium-niobium and chromium-niobium-nickel

SOURCE: Akademiya nauk SSSR. Institut metalurgii, Issledovaniya po zharoprochnym splavam. v.8. 1962. 47-56

TEXT: The Cr-Nb, the quasibinary $NbCr_2$-Ni_7Nb, and the Cr-Nb-Ni systems were studies in detail by differential thermal analysis and by x-ray diffraction analysis; the phase diagrams derived are shown. The Cr-Nb alloy containing 47.18% Nb (i.e., corresponding to the stoichiometric $NbCr_2$ composition) was found to undergo an allotropic transformation at 1590°C, and to have a m.p. of 1720°C; the allotropic transformation is associated with a transition from a low temperature β structure of the $MgCu_2$ type to a high-temperature one (ε) of the $MgZn_2$ type with lattice parameters a=4.92 and c=8.10 kX. The width of the zone on the binary phase diagram does not exceed

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S/659/62/008/000/006/028
I048/I248

Phase diagrams for the systems...

1.5% but its boundaries are uncertain. In the system Nb-Cr, an eutectoid transformation ($\delta \rightleftarrows \alpha + \beta$) occurs at 1585°C in Cr-rich alloys, while a peritectoid transformation ($\alpha + \beta \rightleftarrows \delta$) takes place at 1625°C in Nb-rich alloys. The addition of 5-6% Ni to the $NbCr_2$, with tempering at 1100°C, causes the formation of a new phase which is assumed to consist of a solid solution of Ni in the ε-modification of $NbCr_2$; the solubility of Ni in the ε-phase is 36% at 1100°. A four-phase peritectoid equilibrium $\iota + \varepsilon \rightleftarrows \alpha + \delta$ (where ι is Ni_3Nb) exists at 1160°C in the Cr-Ni-Nb diagram, in the section confined within the Cr-Ni-Ni_3Nb-$NbCr_2$ quadrangle; the composition of the peritectoid point is: 30.0% Cr, 23.5% Nb, 46.5% Ni. This quadrangle contains one quasibinary section only, namely, the $NbCr_2$-Ni_3Nb one. There are 9 figures and 1 table.

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S/659/62/008/000/007/028
I048/I248

AUTHORS: Svechnikov, V.N., Kocherzhinskiy, Yu.A., Latysheva, V.I., and Pan, V.M.

TITLE: A study of chromium-niobium-titanium alloys

SOURCE: Akademiya nauk SSSR. Institut metalurgii. Issledovaniya po zharoprochnym splavam. v.8. 1962. 56-61

TEXT: This is part of a systematic study of ternary systems consisting of Cr, Nb, and various third components; this part deals with Cr-based alloys containing up to 47.5% Nb and 37.5% Ti, and with Nb-based alloys containing up to 30% Cr and 30% Ti. The isothermal sections at 1250°C and 1380°C are presented. In the Cr-rich corner (above 60% Cr) there are three one-phase regions (α-solid solution based on Cr, β-solid solution based on $NbCr_2$, and γ-solid solution based on $TiCr_2$), three two-phase regions ($\alpha+\beta$, $\alpha+\gamma$, $\beta+\gamma$) and one three-phase region ($\alpha+\beta+\gamma$) at 1250°C; at 1380° only α, β, and $\alpha+\beta$ exist and a liquid phase (composition 25-35% Ti, 5-15% Nb) is observed. In the Nb rich corner (above 70%

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S/601/62/000/015/009/010
A004/A127

AUTHORS: Svechnikov, V.N., Pan, V.M.

TITLE: The special features of the equilibrium diagram and the dissolution and separation processes in the Cr-Ni system

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik nauchnykh rabot. no. 15. Kiev, 1962. Voprosy fiziki metallov i metallovedeniya, 164 - 178

TEXT: 27 alloys with a nickel content of up to 65% were produced for testing purposes. Refined electrolytic chromium containing 0.0022% O, 0.009% N, 0.004% Si, not more than 0.0003% Pb, Sn, Bi, Sb, Cd, and HO(NO) grade nickel of 99.99% purity were used as initial materials, the alloys being smelted partly in an arc furnace and partly in a furnace of the Tamman type in crucibles of Al-oxide. A detailed table of the alloy compositions and their annealing conditions is presented. As a result of the tests carried out, the absence of eutectoid and other non-variation transformations in the Cr-Ni system was found in the solid state. The diagram of fusibility of the Cr-Ni-system and the solubility curve of

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nickel in chromium were plotted again. It was found that the solubility is considerably reduced with a decrease in temperature (from 39.5% at 1,345°C to 0.1% at 800°C). The heat value of dissolving nickel in chromium was rated and proved to be 46,000 cal/mole. Some anomalous volumetric effects in tempering hardened Cr-Ni alloys with a nickel content of 30 - 40% at 1,310°C were detected. The origin of these effects could not be cleared up. There are 9 figures and 2 tables.

SUBMITTED: June 28, 1961

S/601/62/000/015/008/010
A004/A127

AUTHORS: Svechnikov, V.N., Pan, V.M.

TITLE: Diagram of phase equilibria of the Cr-Ni-Ni_3Nb-$NbCr_2$ system

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik nauchnykh rabot. no. 15. Kiev, 1962. Voprosy fiziki metallov i metallovedeniya, 156 - 163

TEXT: The equilibrium diagram of the Cr-Ni-Nb system has not been known hitherto. The authors cite a number of bibliographic references in which attempts were made to plot the diagram of similar systems. To investigate the Cr-Ni-Ni_3Nb-$NbCr_2$ system, 180 alloys were produced in an arc furnace with tungsten electrode. The alloy materials were chromium of 99.95%, niobium of 99.97% and 99.4%, and nickel of 99.99% purity. The alloys were subjected to annealing at 1,100°C for 107 hours in an argon atmosphere. The following test methods were used: differential thermic, hardening and x-ray diffraction, hardening and microstructure, dilatometric, durometric (microhardness) analyses, the method of diffusion vapors and micro-x-ray spectral analysis. As a result of these investigations, the com-

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S/601/62/000/015/008/016
A004/A127

Diagram of phase equilibria of the ....

plete diagram of phase equilibria of the Cr-Ni-Ni_3Nb-$NbCr_2$ system was plotted; moreover, a four-phase peritectic equilibrium was detected at 1,175 ± 5°C, a four-phase eutectic equilibrium at 1,173 ± 5°C, and also a four-phase peritectoid equilibrium at 1,160 ± 5°C. It was found that an addition of nickel in ternary alloys results in a stabilization of the ε-phase on the base of the high-temperature modification $NbCr_2$. If the Ni-content is above 5 - 7%, the β-phase on the base of the low-temperature modification $NbCr_2$ is not observed, but is replaced by the ε-phase. There are 6 figures.

SUBMITTED: June 26, 1961

Card 2/2

S/601/62/000/016/029/029
E111/E451

AUTHORS: Svechnikov, V.N., Kocherzhinskiy, Yu.A., Shurin, A.K., Pan, V.M., Spektor, A.Ts., Kobzenko, G.F., Boyko, Yu.A.

TITLE: Equipment for the physico-chemical investigations on high-melting chemically active metals

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalfyzyky. Sbornik nauchnykh rabot. no.16. Kiev, 1962. Voprosy fisiki metallov i metallovedeniya. 220-230

TEXT: The following equipment has been developed over several years in the Otdel metallovedeniya (Department of Science of Metals) of Institut metallofiziki AN UkrSSR (Institute of Physics of Metals AS UkrSSR) for studying alloys such as chromium-niobium-vanadium: 1) Arc furnace, including casting facilities, in which evacuation to 10^{-2} mm is followed by admission of argon to a pressure of 0.2 atm. [Abstracter's note: 10^{-2} mm is a very poor vacuum and the equipment would not work as described.] The argon is then purified in the furnace by a molten titanium getter. A rotary arrangement enables a clean section of the inspection window to be moved into position without breaking the vacuum. 2) Argon purification plant in which air and moisture are removed

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S/601/62/000/016/029/029
E111/E451

Equipment for the physico- ...

by calcium chips at 700 to 750°C, through which a 250 litre batch of gas circulates by convection. 3) Installations for annealing specimens in vacuum or argon at temperatures up to 1000°C and up to 2500°C respectively. 4) An installation for differential thermal analysis in an inert medium at temperatures up to 2000°C with novel arrangements for the thermocouple transmitter, thermostat and furnace and taking 0.5 to 1.5 g specimens. Calibration is effected by melting pure metals, the calibration curve then automatically compensating for systematic errors. 5) An inert atmosphere quenching installation (maximum specimen temperature 1400°C). 6) Vertical inert-atmosphere dilatometer and differential dilatometer for temperatures up to 1500°C. There are 10 figures.

SUBMITTED: January 25, 1962

Card 2/2

PAN, V. M.

AID Nr. 984-11 6 June

Cr-Nb-Ti SYSTEM (USSR)

Svechnikov, V. N., Yu. A. Kocherzhinskiy, V. I. Latysheva, and V. M. Pan, IN: Akademiya nauk UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 16, 1962, 128-131. S/601/62/000/016/017/029

One hundred and forty Cr-Nb-Ti alloys melted from 99.987% pure Cr, 99.5% pure Nb, and iodide Ti have been studied. Phase boundaries were determined, and the isothermal section of the ternary diagram at 1250°C was plotted from the results of microscopic and x-ray diffraction analysis of alloys rapidly cooled after annealing at 1250°C for 75 hrs (Nb-rich alloys, for 150 hrs). The isothermal section was found to contain four single-phase (α, β, δ, ε) regions, four two-phase ($\alpha + \beta$, $\varepsilon + \delta$, $\beta + \delta$, $\alpha + \varepsilon$) regions, and two three-phase ($\alpha + \beta + \varepsilon$, $\delta + \beta + \varepsilon$) regions, where α is a Cr-base solid solution, β, a low-temperature modification of the $NbCr_2$ ($TiCr_2$) intermetallic compound (Laves

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AID Nr. 984-11 6 June

Cr-Nb-Ti SYSTEM (Cont.) S/601/63/000/016/017/029

phase of the $MgCu_2$ type), δ, a (Ti-Nb) base solid solution, and ε, a high-temperature modification of the $NbCr_2$ intermetallic compound (Laves phase of the $MgZn_2$ type). From the data of the differential thermal analysis the phase diagram of the Cr-$NbCr_2$-$TiCr_2$ system was plotted. The solubility of Cr in Nb with 10% Ti was found to vary from 19.2% at the solidus temperature (1610°C) to 17% at 1000°C. [MS]

Card 2/2

SVECHNIKOV, V.N., PAN, V.M., SPEKTOR, A.TS.

Intermediate phases in the iron zirconium system. Zhur.neorg.khim. 8 no.[illegible] S [illegible]. (MIRA [illegible])

1. Institut metallofiziki AN SSSR.

ACCESSION NR: AT4010700 S/2601/63/000/017/0209/0210

AUTHOR: Kocherzhinskiy, Yu. A.; Kobzenko, G. F.; Pan, V. M.; Sviridenko, V. K.; Yupko, L. M.

TITLE: Calibration of the VR-5/20 thermocouple according to critical points up to 3000C. Determination of the melting points of vanadium and niobium of high purity

SOURCE: AN UkrRSR. Insty*tut metalofizy*ky*. Sbornik nauchny*kh trudov, no. 17, 1963. Voprosy* fiziki metallov i metallovedeniya, 209-210

TOPIC TAGS: thermocouple, VR-5/20 thermocouple, thermocouple calibration, vanadium, niobium, vanadium melting point, niobium melting point, tungsten rhenium alloy

ABSTRACT: After calibration studies using the melting points of silver, gold, iron, nickel, palladium, platinum, chromium, molybdenum, and tantalum had shown that the VR-5/20 thermocouple (consisting of electrodes made of tungsten alloys containing 5 and 20% rhenium, respectively) could be used for the accurate determination of temperatures up to 3000C, the authors applied the technique of V. S. Mikheyev to the determination of the melting points of vanadium (1950C) and niobium (2520C). "In conclusion, the authors would like to thank A. M. Gurevich and Ye. I. Pavlova for making the thermocouple available." Orig. art.

Card 1/2

ACCESSION NR: AT4010700

has: 1 figure and 1 table.

ASSOCIATION: Insty*tut metaloflzy*ky* AN UkrRSR (Metallophysics Institute, AN UkrRSR)

SUBMITTED: 00 DATE ACQ: 31Jan64 ENCL: 00

SUB CODE: ML NO REF SOV: 003 OTHER: 001

Card 2/2

L 39932-65 EPA(s)-2/EWT(m)/EWP(w)/EPF(c)/EPF(n)-2/EWA(d)/T/EWP(t)/EWP(b)/
EPA(bb)-2/EWP(z)/EWA(c) Pad/Pt-10/Pu-4 IJP(c) JD/HW/JG/WB
ACCESSION NR: AT5005124 S/2601/64/000/019/0196/0205

AUTHOR: Svechnikov, V. N. (Academician AN UkrSSR); Pan, V. M.; Korobeynikova, V. G.

TITLE: Phase diagram of the niobium-nickel system

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 19, 1964. Voprosy fiziki metallov i metallovedeniya (Problems in the physics of metals and physical metallurgy), 196-205

TOPIC TAGS: niobium, nickel, niobium nickel system, niobium nickel alloy, alloy phase diagram, alloy composition, alloy microstructure, alloy hot hardness, alloy oxidation resistance

ABSTRACT: Forty-nine Nb-Ni alloys, containing 100—0% Nb, were melted from 99.5% pure Nb and 99.8% pure Ni in a nonconsumable tungsten-electrode arc furnace in an argon atmosphere and investigated by various methods of physicochemical analysis. On the basis of obtained results, a complete phase diagram of the Ni-Nb system was plotted (see Fig. 1 of the Enclosure). The maximum solubility of Ni in Nb was found to be about 4.5% at 1320C (1.2 and 0.6% at 1100 and 800C, respectively). The maximum solubility of Nb in Ni was 13.5 at% at eutectic temperature (1285C). The

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L 39932-65
ACCESSION NR: AT5005124

δ-phase, an intermetallic Ni_3Nb compound, has a very narrow (less than 1%) homogeneity region. The η-phase, an NiNb-base solid solution, has a wide homogeneity region. The lattice constant of the γ-phase (an Ni-base solid solution) increases with increasing Nb content from 3.517 kX (for pure Ni) to 3.581 kX at 12% Nb. Further increases of Nb content had no effect on the lattice constant. The microhardness of the η-phase decreases with increasing Nb content. The microhardness and lattice constant of the α-phase, an Nb-base solid solution of Ni, increases only slightly with increasing Ni content. The hardness of Ni-base alloys increases with increasing Nb content from 1.0 Gn/m^2 for pure nickel to 4.0 Gn/m^2 for alloy with 25% Nb. Ni increases the room-temperature hardness of Nb-base alloy but has little or no effect on hardness at high temperatures (800—1000C). Small (up to 4%) additions of Ni increase the oxidation resistance of Nb by five times in 5-hr tests in air at 1000C. Higher additions of Ni have a slight effect on the oxidation resistance. Orig. art. has: 8 figures and 4 tables. [MS]

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of Physics of Metals, AN UkrSSR)

SUBMITTED: 25Jun63 ENCL: 01 SUB CODE: MM

NO REF SOV: 006 OTHER: 006 ATD PRESS: 3189

Card 2/3

L 39678-65 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pu-4 IJP(c) JD/JG
ACCESSION NR: AT5008877 S/2601/64/000/020/0130/0132

34
32
B+1

AUTHOR: Pan, V. M.

TITLE: Effect of purity on the melting point of some refractory metals

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 20, 1964. Voprosy fiziki metallov i metallovedeniya (Problems in the physics of metals and physical metallurgy), 130-132

TOPIC TAGS: chromium, vanadium, niobium, molybdenum, chromium refining, vanadium refining, niobium refining, molybdenum refining, refractory metal refining, refractory metal purity, refractory metal melting point, melting point purity dependence

ABSTRACT: The effect of purity on the melting point of chromium, vanadium, niobium, and molybdenum has been investigated. Electrolytic, 99.9%-pure chromium was outgassed in high vacuum with subsequent induction melting in a purified argon atmosphere. The refining reduced the initial nitrogen content from 0.008—0.015% to

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L 39678-65
ACCESSION NR: AT5008877 2

0.001% or less, raised the melting point from 1850 to 1890C, and lowered the NDT temperature to -30C. Specimens of 99.5%-pure vanadium, 99.4%-pure niobium, and 99.9%-pure molybdenum were refined by electron beam melting in a 10^{-5} mm Hg vacuum, which raised their melting point from 1890, to 2470, and 2620C to 1950, 2520, and 2630C, respectively. Orig. art. has: 2 figures. [ND]

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of Physics of Metals, AN UkrSSR)

SUBMITTED: 15Jan64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 000 ATD PRESS: 3230

Card 2/2

L 23620-65 EWT(m)/EWA(d)/EWP(t)/EWP(b)/EWP(1) IJP(c) MJW/JD/JG/MLK

ACCESSION NR: AT5002785 S/0000/64/000/000/0216/0217

AUTHOR: Kocherzhinskiy, Yu. A.; Kobzenko, G. F.; Pan, V. M.; Sviridenko, V. K.; Yupko, L. M.

TITLE: Types of thermocouples from alloys of the tungsten - rhenium system and calibration of the VR-5/20 thermocouple

SOURCE: Vsesoyuznoye soveshchaniye po probleme reniya. 2d, Moscow, 1962. Reniy (Rhenium); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 216-217

TOPIC TAGS: thermocouple, tungsten alloy, rhenium alloy, thermocouple calibration

ABSTRACT: On the basis of the tungsten - rhenium phase diagram, the authors distinguish three types of thermocouples which can be prepared from alloys of this system: (1) thermocouples from two solid solutions such as VR-5/20, etc., (2) thermocouples from the pure components (VR-0/100), and (3) thermocouples from pure tungsten and a solid solution of rhenium in tungsten with a minimum rhenium content (they are used for the measurement of the highest temperatures, up to 3100-3200C, and are designated VR-0/3, VR-0/5, and VR-0/8). The authors give a

Card 1/2

L 23620-65

ACCESSION NR: AT5002785

7

calibration graph (thermo-emf versus temperature) of one of the thermocouples of the latter type, the VR-5/20, which they plotted on the basis of the melting points of pure metals and transition points of iron in the solid state on heating. The VR-5/20 thermocouple may be used to measure temperatures up to 3000C and has a satisfactory sensitivity. "The authors express their appreciation to A. M. Gurevich, S. K. Danishevskiy, and Ye. I. Pavlova for the thermocouples supplied for the study." Orig. art. has: 1 figure.

ASSOCIATION: None

SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 005 OTHER: 001

VR-3 18
VR-20 18
VR-8 18
VR-100 18

Card 2/2

L 41560-65 EWT(m)/EWP(w)/EPF(c)/EPF(n)-2/EWP(v)/T/EWP(t)/EWP(b)/EWA(c) 39 37
Pu-4 IJP(c) JD/JG/WB
ACCESSION NR: AT5008875 S/2601/64/000/020/0108/0124 B+1

AUTHOR: Alfintseva, R. A.; Dmitriyeva, G. P.; Korobeynikova, V. G.; Pan, V. M.; Shurin, A. K.; Svechnikov, V. N. (Academician An UkrSSR)

TITLE: Investigation of chromium-iron-molybdenum and chromium-iron-tungsten alloys

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 20, 1964. Voprosy fiziki metallov i metallovedeniya (Problems in the physics of metals and physical metallurgy), 108-124

TOPIC TAGS: chromium alloy, iron containing alloy, molybdenum containing alloy, tungsten containing alloy, alloy structure, alloy hot hardness, alloy oxidation resistance

ABSTRACT: The following alloys have been investigated to determine which ternary Cr-Fe-Mo or Cr-Fe-W alloy would provide the optimum combination of the heat resistance of Mo or W and the ductility of Cr: binary chromium-iron alloys containing 45—90% Cr, chromium-molybdenum alloys containing 10—30% Mo, chromium-tungsten alloys containing 10—30% W, and ternary alloys containing up to 55% Fe and

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L 41560-65
ACCESSION NR: AT5008875

up to 30% Mo or W. In Cr-Fe-Mo alloys containing 45—50% Cr, additions of up to 6% Mo do not improve hot hardness or oxidation resistance. Increasing Mo content leads to the formation of a brittle σ-phase which has a very low oxidation resistance in air at 1100C and lowers the oxidation resistance of the ternary Cr-Fe-Mo alloys in direct proportion to its content in the alloys. In Cr-Fe-W alloys, the single phase σ-region extends to about 32% W, but it tapers off at about 1275C. At high temperature (1450C), the single-phase region of α-solid solution with a b.c.c. lattice increases substantially, so that all the investigated alloys, except for an alloy containing 40% Fe and 30% W, became single-phase alloys at a more or less high temperature. A single-phase structure and a satisfactory ductility is readily preserved in all but three of these alloys by oil quenching from 1450C. Tungsten additions increase somewhat the melting temperature of Cr-Fe alloys, e.g., 30% W increases the solidus temperature by 100 and 150C in alloys with 40 and 50% Fe, respectively. Tungsten also increases the hardness of Cr-Fe-W alloys at both room and high temperature and does not impair their oxidation resistance. Orig. art. has: 8 figures and 3 tables. [MS]

Card 2/3

L 41560-65

ACCESSION NR: AT5008875

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of Metal Physics, AN UkrSSR)

SUBMITTED: 13Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 007 ATD PRESS: 3234

Card 3/3

LUK'YANCHIKOV, Artem St[illegible], [illegible]; [illegible], [illegible], kand. [illegible] nauk, retsenzent

[Submerged gas heating of [illegible] gazovyi nagrev [illegible] 1965. 130 p.

ACC NR: AT6036278 (N) SOURCE CODE: UR/0000/66/000/000/0056/0066

AUTHOR: Pan, V. M.

ORG: Institute of Physics of Metals, AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Phase diagram of the vanadium-gallium system

SOURCE: AN UkrSSR. Struktura metallicheskikh splavov (Structure of metal alloys). Kiev, Izd-vo Naukova dumka, 1966, 56-66

TOPIC TAGS: vanadium alloy, gallium containing alloy, alloy phase diagram

ABSTRACT: A series of 35 vanadium-gallium alloys containing 10—98 wt% Ga melted from 99.5% pure V and 99.999% pure Ga in an arc furnace in an argon atmosphere was studied by various methods of physicochemical analysis. On the basis of the data obtained, a phase diagram of alloys of the V-Ga system was plotted (see Fig. 1).

Card 1/3

ACC NR: AT6036278

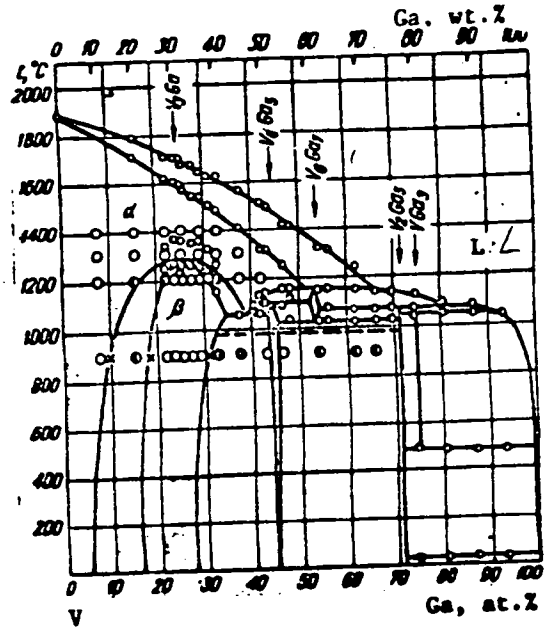

Fig. 1. Phase diagram of the vanadium-gallium system

Card 2/3

ACC NR: AT6036278

G. A. Alfintser (Institute of Physics of Metals, AN UkrSSR) participated in the work.
Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: 28Jun65/ ORIG REF: 003/ OTH REF: 010/ ATD PRESS: 5106

Card 3/3

L 21502-66 EWT(m)/EPF(n)-2/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6009420 SOURCE CODE: UR/0020/66/166/006/1328/1331

AUTHOR: Svechnikov, V. N. (Academician AN UkrSSR); Pan, V. M.; Beletskiy, Yu. I.

ORG: Institute of Metal Physics, Academy of Sciences UkrSSR (Institut metallofiziki Akademii nauk UkrSSR)

TITLE: Relationship between the shape of the homogeneity region of the β-phase in the niobium-tin system and the superconductivity characteristics of Nb_3Sn

SOURCE: AN SSSR. Doklady, v. 166, no. 6, 1966, 1328-1331

TOPIC TAGS: niobium tin compound, superconducting compound, superconducting alloy

ABSTRACT: A series of niobium-tin alloys containing up to 37.5 at % tin were studied in order to explain the negative effect of annealing at temperatures above 900—1000C on the characteristics of superconductivity of Nb_3Sn compound. Alloys were annealed at 700—1800C for up to 350 hr and quenched. All the alloys containing 16.9 to 37.5 at % tin were found to consist of a phase with a β-tungsten structure, i. e., Nb_3Sn phase, regardless of the annealing temperature, which proves that this compound is stable at temperatures up to 1800C. The lattice parameter of Nb_3Sn was found to increase linearly with increasing tin content from 5.2790 Å at 9.3 at % tin to 5.2875 Å at 34.9 at % tin. The niobium side of the phase diagram of the niobium-tin system plotted on the basis of experimental results (see Fig. 1) shows that the

Card 1/3 UDC: 541.123.24:537.312.62

L 21562-66

ACC NR: AP6009420

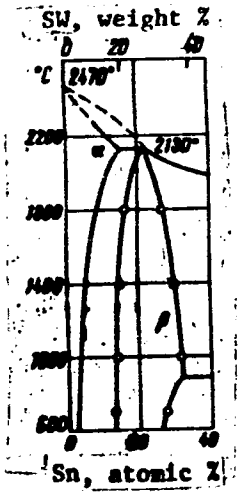

Fig. 1. Niobium side of the niobium-tin phase diagram

solubility of tin in Nb_3Sn drops sharply at temperatures below 900C. On the other hand the critical temperature of the compound appears to depend linearly on the tin content, which was determined from the analysis of some literature data. This explains why the critical temperature of Nb_3Sn increases sharply with annealing temperature increased to 900C and drops again with a further increase of annealing temperature. Orig. art. has: 4 figures and 1 table. [DV]

Card 2/3

L 21562-66

ACC NR: AP6009420

ture increased to 900C and drops again with a further increase of annealing temperature. Orig. art. has: 4 figures and 1 table. [DV]

SUB CODE: 20, 11/ SUBM DATE: 16Jul65/ ORIG REF: 002/ OTH REF: 019/ ATD PRESS: 4219

superconducting alloy 18

Card 3/3

PAN, V.Ya.

Comments on a problem of N.N. Luzin. Nauch. dokl. vys. shkoly; fiz.-mat. nauki no.4:59-62 '58. (MIRA 12:5)

1.Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Functions, Continuous)

~~16(1)~~ 16.2600 16.4100

AUTHOR: Pan, V.Ya. SOV/155-58-4-10/34

TITLE: Concerning a Question of N.N. Luzin (Po povodu odnogo voprosa N.N. Luzina)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1959, Nr 4, pp 59 - 62 (USSR)

ABSTRACT: Let the function $\varphi(x)$ continuous on $[a,b]$ be approximated by $\varphi_1(x)$, $\varphi_2(x)$, ..., $\varphi_n(x)$, ... Let $L_n = \max_{x\in[a,b]} |\varphi(x) - \varphi_n(x)|$ and $G_n \subset [a,b]$ be the set of those points, where it is $|\varphi(x) - \varphi_n(x)| = L_n$; $\mu_n = \text{mes } G_n$. In the connection with the problem Nr 28 of Luzin [Ref 1] the author investigates so-called "pure Chebyshev" approximation sequences $\{\varphi_n(x)\}$ and specifies several cases, where $\lim_{n\to\infty} \mu_n = 0$. Simultaneously it is proved that this relation must not absolutely always exist : There are in a certain sense

Card 1/2

Concerning a Question of N.N. Luzin SOV/155-58-4-10/34

very good approximating sequences for which it is $\mu_n > 0$ for all n.

Yu.A. Brudnyy and I.Ye. Gopengauz are mentioned in the paper. The author thanks V.D. Yerokhin for the subject and A.G. Vitushkin for advices.

There are 3 Soviet references.

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

SUBMITTED: June 4, 1958

Card 2/2

SOV/20-127-2-8/60

16(1),16(2)

AUTHOR: Pan, V.Ya.

TITLE: Schemes for the Computation of Polynomials With Real Coefficients

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 266-269 (USSR)

ABSTRACT: For the calculation of the polynomial

$$P_n(x) = \sum_{i=0}^{n} a_i x^{n-i} \quad , \quad n \geqslant 5$$

the following scheme is proposed:

$$g(x) = x(x+\lambda_1) \; ; \quad h(x) = g(x)+x \; ; \quad p_0(x) = x$$

$$p_s(x) = p_{s-1}(x)\left\{(g(x)+\lambda_{4s-2})(h(x)+\lambda_{4s-1})+\lambda_{4s}\right\}+\lambda_{4s+1}$$

$$(s=1,2,\ldots,k)$$

$$(1) \qquad P_n(x) = \begin{cases} a_0 p_k(x) & \text{for } n = 4k+1 \\ a_0 x p_k(x)+\lambda_{4k+2} & = 4k+2 \\ a_0\left[p_k(x)(g(x)+\lambda_{4k+2})+\lambda_{4k+3}\right] & = 4k+3 \\ a_0 x\left[p_k(x)(g(x)+\lambda_{4k+2})+\lambda_{4k+3}\right]+\lambda_{4k+4} & = 4k+4 \end{cases}$$

Card 1/2

Schemes for the Computation of Polynomials SOV/20-127-2-8/7

Theorem: For every $P_n(x)$ with real coefficients there exist real parameters $\lambda_1, \lambda_2, \ldots, \lambda_n$ so that after the substitution of these parameters into (1) there results the value of $P_n(x)$ in the point x.

For the determination of the parameters λ a system of equations has to be solved; a graphical method is also possible.

1 theorem, 3 lemmas, and 4 remarks are given altogether. The author thanks A.G.Vitushkin for giving the theme and aid.

There is 1 Soviet reference.

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

PRESENTED: March 19, 1959, by S.L.Sobolev, Academician

SUBMITTED: March 13, 1959

Card 2/2

30375

S/582/61/000/001/001/
D202/D304

9 7100 (1121)

AUTHOR: Pan, V. Ya. (Moscow)

TITLE: Certain schemes for evaluating polynomials with real coefficients

SOURCE: Problemy kibernetiki, no. 5, Moscow, 1961, [illegible]

TEXT: The author recommends methods which under certain [illegible] are more economical than Horner's method and involve, in [illegible] nomial degree n, about n/2 multiplications and n additions and subtractions. These methods require a preliminary pre-[illegible] the coefficients, i.e. they are put into correspondence with [illegible] parameters and then a sequence of arithmetical operations [illegible] [illegible], generating a function identically equal to the [illegible] The advantages of these methods appear when the same [illegible] must be repeatedly evaluated, as is true, for example, [illegible] ter, for evaluating elementary functions such as sin x, [illegible] selecting the best method for any individual case [illegible] must be made between minimization of the number of arithmetic [illegible]

Card 1/4

Certain problems of evaluating ...

operating and the difficulty of the preliminary [illegible] increased markedly towards higher values [illegible]

Card 4

30375

S/582/61/000/005/00[illegible]
D222/D306

Certain schemes for evaluating ...

$$g_2(x) = h_2(x) + x$$

$$p_4(x) = (g_2(x) + \lambda_2)(h_2(x) + \lambda_3) + \lambda_4$$

$$p_6(x) = [(g_2(x) + \lambda_2)(g_2(x) + \lambda_3) + \lambda_4](h_2(x) + \lambda_5) + \lambda_6$$

$$p_8(x) = p_6(x)(g_2(x) + \lambda_7) + \lambda_8$$

$$p_{11}(x) = (xp_8(x) + \lambda_9)(g_2(x) + \lambda_{10}) + \lambda_{11}$$

$$p_i(x) = \lambda_0 p_i(x) \text{ when } i = 4, 6, 8, 11$$

$$p_m(x) = \lambda_0 x p_{m-1}(x) + \lambda_m \text{ when } m = 5, 7, 9, 10$$

$$p_{10}(x) = x[\lambda_0 x p_8(x) + \lambda_9] + \lambda_{10}$$

$$p_{13}(x) = \lambda_0[(xp_4(x) + \lambda_5)(g_2(x) + \lambda_6) + \lambda_7]$$

Card 3/4

30375

S/552/61/000/005/001/012
D212/D306

Certain schemes for evaluating ...

A theorem is stated (and the method of proof indicated by referring to a similar proof for the general scheme [illegible]). For any [illegible]

$P_n(x) = \sum_{m=0}^{n} \lambda_m x^{n-m}$, $\lambda_0 \neq 0$ [illegible] the fourth and fifth [illegible]

for almost all polynomials $P_n(x)$ from the sixth to the twelfth degree inclusively, we can find such values of the real parameters $\lambda_1, \lambda_2, \ldots, \lambda_n$ that $P_n(x) = \omega_n(x)$. Also for every $P_n(x)$ we can find such values of $\lambda_1, \lambda_2, \ldots, \lambda_n$ that $P_n(x) = \omega_n(x)$. The restriction implied in the theorem is a very weak one and is expressed in [illegible] this equation in terms of the parameters λ. The author thanks [illegible] Vitushkin for formulating the problem and for directing the work. There are [illegible] table and [illegible] Soviet-bloc references.

SUBMITTED: November [illegible]

Card 1/4

[illegible] Y.

A[illegible]proxi[illegible]ti[illegible] [illegible]lytic functions by mean[illegible] of [illegible]tional [illegible]nes. Us[illegible]. mat. nau[illegible] [illegible] no.5:19[illegible]-1[illegible] 7 S-O '61.
([illegible] 14:1

(Fun[illegible]

S/208/62/002/001/010/016
D299/D303

$$\lambda_1 = \frac{\alpha_1^{(n)} - \sum_{l=0}^{(n-r-2)/2} i_{r+2l} - k_r}{[n/2]}, \text{ where } k_r = \begin{cases} 0 \text{ for } r = 2, 4, \\ 1 \text{ for } r = 5; \end{cases} \quad (3)$$

$$\mu_s = \lambda_1 + i_s, \quad s = r, r+2, \ldots, n-2; \quad (4)$$

$$\sum_{m=0}^{[(s+1)/2]} (-\lambda_{s+1})^m \sum_{i=m}^{s+1-m} C_i^m \alpha_{s+1-i-m}^{(s+2)} (-\mu_s)^{i-m} = 0, \quad s = n-2, n-4, \ldots, r, \quad (5)$$

$$\alpha_0^{(s+1)} = 1, \quad C_i^m = i!/m!(i-m)!; \quad (6)$$

where

$$\alpha_l^{(s)} = \alpha_l^{(s+2)} + (-\mu_s)\alpha_{l-1}^{(s)} + (-\lambda_{s+1})\alpha_{l-2}^{(s)}, \quad l = 1, 2, \ldots, s,$$

$$\lambda_{s+1}\alpha_s^{(s)} + \lambda_{s+2} = \alpha_{s+2}^{(s+2)}.$$

These relations can be readily obtained from Eq. (1), by virtue of the following Lemma: With any integer $s \geq 2$, the relation

$$p_{s+2} = (x^2 + \mu_s x + \lambda_{s+1})\, p_s + \lambda_{s+2},$$

where

$$p_q = x^q + \sum_{l=1}^{q} \alpha_l^{(q)} x^{q-l}, \quad q = s, s+2,$$

is equivalent to system (6), supplemented by (5). Further, the algorithm for determining the parameters is written:

$$A_1 \overset{4}{\neg} A_2 \overset{6}{\neg} A_3 P_4 \overset{2}{\Gamma} A_5 P_6 \overset{3}{\Gamma} A_7 \Omega_8.$$

The signs occurring in this algorithm are defined. At present, the algorithm has been programmed for a computer (for $n \leq 8$). Computation of polynomials by the scheme $M_{i..}^{r}$, yields about the same accuracy as by Horner's scheme. In an appended table, examples are given for the use of the $M_{i..}^{r}$-scheme in calculating the function f(x). There are 2 tables and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: T.S. Motskin, Evaluation of polynomials and evaluation of

S/208/62/002/001
D299/D302

Polynomial computation schemes

rational functions. Bull. Amer. Math. Soc., 1955, [illegible]
Hastings, Approximations for digital computers. Princeton-New Jer-
sey, Princeton Univ. Press, 1955. E.E. Allen. Polynomial and Ratio-
nal Approximation to some modified Bessel function. Math. Tables and Other Aids
to Comput., 1956, 10, no. [illegible] 162-167

SUBMITTED: September [illegible] 1961

Card 5/5

S/582/62/000/007/001/009
D011/D211

AUTHOR: Pan, V. Ya. (Moscow)

TITLE: On some methods of computing values of polynomials

SOURCE: Problemy kibernetiki, no. 7, 1962, 21-30

TEXT: A method for computing the values of the polynomial $P_n(x) = \sum_{k=0}^{n} a_k x^{n-k}$ where $a_0, a_1, \ldots, a_n$ ($a_0 \neq 0$) are given real numbers, is looked for. This method has to be independent of the arbitrary point x and to use arithmetic operations only.

The main result of this paper is the exact lower estimate of the number of operations in computation schemes with no preliminary re-arrangement of the polynomial. It is proved that Horner's scheme

$$P_n(X) = (\ldots((a_0x + a_1)x + a_2)x + \ldots + a_{n-1})x + a_n$$

is almost always the most economical one. This result is generalized for polynomials in more than one variable.

A simple result for schemes with a preliminary re-arrangement for polynomials in more than one variable is arrived at. A scheme is given by which the lower estimate of the number of operations as given by which the lower estimate of the number of operations as given by Belaga (Ref. 4: Problemy kibernetiki, no. 5, M., Fizmatgiz, 1961, 7-15) can be reached asymptotically.

SUBMITTED: August 13, 1960 (initially)

February 3, 1961 (after revision)

Card 1/1

L 23939-66 EWT(d) IJP(c)

ACC NR: AP6014946 SOURCE CODE: UR/0208/65/005/001/0116/0118

AUTHOR: Pan, V. Ya. (Moscow)

ORG: none

TITLE: Computation of fifth and seventh-degree polynomials with real coefficients

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 5, no. 1, 1965, 116-118

TOPIC TAGS: polynomial, mathematics

ABSTRACT: Polynomials of the type $\sum_{l=0}^{n} a_l x^{n-l}$ are expressed in such a way that the computation requires the least number of steps. Cases n = 5, 7 are given. Orig. art. has: 1 formula. [JPRS]

SUB CODE: 12 / SUBM DATE: 15Jun64 / ORIG REF: 003

Card 1/1 UDC: 518.512.34

1ST AND 2ND GROUP

PROCESSES AND PROPERTIES INDEX

A-1

Amperometric (polarometric) titrations. I. Amperometric titration of lead with dichromate or chromate. I. M. Kolthoff and Y. P. Pan (J. Amer. Chem. Soc., 1939, 61, 3402—3410).—In "amperometric" titrations the current which passes between two suitable electrodes at a const. applied e.m.f. is measured. Depending on the conditions, one or both electrodes are placed in the titration medium, and the end-point in general is the point of intersection of two lines giving the change in current before and after the equivalence point. The amperometric titration method has been applied to the accurate determination of $Pb^{\cdot\cdot}$ [in aq. $Pb(NO_3)_2$] with $K_2Cr_2O_7$ or K_2CrO_4, using the dropping Hg electrode as an indicator electrode. The method is sensitive to 0·001M-$Pb^{\cdot\cdot}$. $Pb^{\cdot\cdot}$ can also be titrated amperometrically in presence of large amounts of $Ba^{\cdot\cdot}$ when the solution is slightly acid with $HClO_4$. The fractional ppts. of $Pb^{\cdot\cdot}$ and $Ba^{\cdot\cdot}$ with K_2CrO_4 in a neutral medium is not accurate, owing to co-ppts. of $BaCrO_4$ and $PbCrO_4$. W. R. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PANA, A.

Fizkhim., No. 196C, No.

PANA A N.

T-5

RUMANIA/General Problems of Pathology - Tumors.

Abs Jour : Ref Zhur - Biol., No 3, 1958, 12819

Author : Pana, A.N., Dancila St., Buzuloiu, Gh, Sahleanu, V., Cotutiu, C.

Inst : Not given.

Title : A Case of the Adrenocortical Tumor Syndrome in an Infant.

Orig Pub : Studii si cercetari endocrinol. Acad. RPR, 1956, 7, No 2, 253-255

Abstract : This is a case of a three-year old female infant with the syndrome of adrenocortical hyperfunction. Beginning at 3 months there was rapid weight gain, deposition of fat on the trunk and face, hypertension, and hypertrichosis with growth of hair on the forehead, cheeks, upper lip and around the genitalia. A tumor the size of a fist was detected in the left renal area. There was an increased

Card 1/2

MILCU, St.M., academician; PANA, A.N.; LUNGU, Al.

The clinical characteristics of incipient hyperthyroidism.
Stud. cercet. endocr. 14 no. 3:295-311 '63

(HYPERTHYROIDISM)

BC

B-1-2

ANALYSIS OF INDUSTRIAL PHOSGENE. C. D. Nenitzescu and C. Pana (Bul. Soc. Chim. Romania, 1933, 15, 45-48).—Cl_2 in a $COCl_2$-Cl_2 mixture is "adsorbed" by Sb, and $COCl_2$ by aq NH_3 or EtOH-KOH. The components are determined by weighing. J. L. D.

New method for the analysis of industrial phosgene

[illegible] *Romana* 15, [illegible] The mixt. of $COCl_2$ and Cl_2 is drawn through a previously weighed tube contg. metallic Sb. This tube is connected to an absorption bulb contg. 20 cc. of a 10% soln. of alc. potash and carrying a tube filled with silica gel to prevent escape of vapors from the absorption bulb. These 2 are weighed together before the detn. After running the mixt. to be analyzed through the app. for 5 min., dry air is drawn through to insure complete removal of the $COCl_2$ from the tube contg. the Sb. The gain in wt. of the tube contg. the Sb represents the wt. of Cl_2 in the mixt. Likewise the gain in wt. of the absorption bulb and the silica gel tube represents the wt. of $COCl_2$ in the mixt. As a check, the contents of the absorption bulb can be transferred to a volumetric flask acidified with HNO_3, diluted to vol., and an aliquot portion titrated by Volhard's method. W. A. Mee

PROCESSES AND PROPERTIES INDEX

CA

New method for the analysis of industrial phosgene

Costin D. Nenitzescu and Constantin Pana. *Bul. soc. chim. Romania* 15, 45-8(1933).—The mixt. of $COCl_2$ and Cl_2 is drawn through a previously weighed tube contg. metallic Sb. This tube is connected to an absorption bulb contg. 20 cc. of a 10% soln. of alc. potash, and carrying a tube filled with silica gel to prevent escape of vapors from the absorption bulb. These 2 are weighed together before the detn. After running the mixt. to be analyzed through the app. for 5 min., dry air is drawn through to insure complete removal of the $COCl_2$ from the tube contg. the Sb. The gain in wt. of the tube contg. the Sb represents the wt. of Cl_2 in the mixt. Likewise, the gain in wt. of the absorption bulb and the silica gel tube represents the wt. of $COCl_2$ in the mixt. As a check, the contents of the absorption bulb can be transferred to a volumetric flask, acidified with HNO_3, diluted to vol., and an aliquot portion titrated by Volhard's method. W. A. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

NANA, A., prof.; MIRCEOIU, C., dr.; PANA, C., dr.

Early evacuation disorders after resections of the stomach. Med. inter., Bucur 13 no.6:947-953 Je '61.

1. Lucrare efectuata in Clinica I chirurgicala, Cluj.
(GASTRECTOMY complications)

PANA, A., prof.; MIRCIOIU, C., dr.; PANA, C., dr.; NEUMANN, E., dr.

Contribution to the mechanism of ulcerous hemorrhages. Participation of the liver in ulcerous upper digestive hemorrhage. Med. intern., Bucur 13 no.2:211-219 F '61.

1. Lucrare efectuata in Clinica chirurgicala I, Cluj.

(PEPTIC ULCER HEMORRHAGE etiology)
(LIVER pathology) CAPILLARY PERMEABILITY)
(VITAMIN C DEFICIENCY complications)

FANA, G.

Studies on the power absorbed in cutting wood into chips in relation to its temperature and humidity. p. 407. Academia Republicii Populare Romine. Institutul de Mecanica Aplicata. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti. Vol. 6, no. 3/4, July/Dec. 1955.

So. East European Accessions List Vol. 5, No. 9 September, 1956

PANA, G.

Contributions to the determination of the effect of different hygrothermal and treatments on the physical and mechanical properties of beech wood. p. 161. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti. Vol. 6, no. 1/2, Jan./June 1956.

SOURCE: East European Accessions List, (EEAL), Library of Congress, Vol. 5, No. 11, November, 1956.

PANA, G.

The use of deteriorated timber for construction and industrial purposes. p. 155. (STUDII SI CERCETARI DE MECANICA APLICATA. Vol. 8, no. 1, Jan/Mar. 1957. Bucuresti, Rumania)

SO: Monthly List of East European Accessions (EEAL) LC. Vol. 6, No. 12, Dec. 1957, Uncl.

[illegible]

[illegible]

[illegible] Romanian Institute [illegible] Industrial [illegible], Bucharest, Romania, Vol. [illegible], [illegible], [illegible].

[illegible]

[illegible]

BUSILA, V. T., prof.; VASILESCU, I., dr.; CUCUTUZ, L., dr.; ALEXANDRESCU, R., dr.; POPIAN, R., dr.; FITARAU, A., dr.; PLACINTA, A., dr.; STAMBOLIU, D. W., dr.; BACALOGLU, D., dr.; PANA, G., dr.; NOVACOVICI, O., dr.; COTLEAREVSCHI, V., dr.; COTLEAREVSCHI, E., dr.

Clinical and biological characteristics of a focus of trichinosis. Med. intern., Bucur 13 no.2:227-236 F '61.

1. Clinica de boli contagioase, Timisoara (for Bacaloglu). 2. Spitalul si Sanepidul Orsova (for Cotlearevschi).

(TRICHINOSIS)

CATRINA, I.; PANA, G.; BERGER, Vladimir, inz. [translator]

Use of radioisotopes for detection of inner defects of plywood, particle board and fiberboard. Drevo 18 no.3:96-98 Mr '63.

1. Institutul de Cercetari Foresiere, Bucuresti (for Catrina and Pana).

PANA, GH. I.

Contribution to the Establishment of Different Hygro- and Hydrothermal Treatments on the Physical and Mechanical Properties of Beech Wood. Studii Si Cercetari De Mechanica Aplicata (Studies and Research in Applied Mechanics), #1-2:161:Jan-Jun 55

PANA, Gh. I., dr. ing.

Aspects of a study visit organized by the Curopean Forestry Commission of the F.A.O. Pt. 2. Ind lemnului 14 no. 12: 461-467 D '63.

PANA, Gh. I., dr. ing.

Aspects of a study visit organized by the European Forestry Commission of the F. A. O. Pt. 1. Ind lemnului 14 no. 11: 415-420 N '63.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001238920005-1"

[illegible] MORTZ, I. [illegible]
[illegible] BEL [illegible] O. [illegible]
[illegible]
ANDORL [illegible]

[illegible]

[illegible]

LAZEANU, M., dr; PANA, I., dr.; ZISSU, I., dr.; IONESCU, N., dr.

Otopathic fistulous paralabyrinthitis. (Clinical and radiological considerations). Otorinolaringologie (Bucur) 10 no.1: 41-47 Ja-Mr'65.

1. Lucrare efectuata in colaborare de catre clinicile de O.R.L. si radiologie ale F.P.S.M.F., Spitalul "Coltea", Bucuresti.

PANA, Ioana

Contributions to the study of the paleoecology of Maeotic and Pontian fauna (Buzau region). Studii cerc geol 8 no.1:35-44 '63.

1. Comunicare prezentata de academician M.G. Filipescu.

PANA, L., ing.

Telephone system with impulse modulation. Pt. 2. Telecomunicatii 5 no. 4:145-159 Jl-Ag '61.

PANA, L., ing.

Telephonic system with pulse modulation. II. Telecomunicatii 5 no.5:205-215 S-O '61.

L 33050-66

ACC NR: AP6024235

SOURCE CODE: RU/0005/65/000/006/0212/0219

56
B

AUTHOR: Pana, Liviu--Pane, L. (Engineer)

ORG: none

TITLE: Characteristics of the transistorized time-division telephone system MIP 12-24

SOURCE: Telecomunicatii, no. 6, 1965, 212-219

TOPIC TAGS: telephone system, amplitude modulation, position modulation, pulse phase modulation, frequency division, transistorized circuit/MIP 12-24 telephone system

ABSTRACT: A detailed description of the transistorized MIP 12-24 telephone system, with 24 time-divided channels. Special attention is given to the generation of the sampling pulse, the frequency division from 48 to 8 kilocycles per second, the generation of the synchronisation pulse, the conversion of amplitude modulation into position modulation, and automatic phase control. Orig. art. has: 10 figures. [Based on author's Eng. abstract] [JPRS]

SUB CODE: 17, 09 / SUBM DATE: none / ORIG REF: 002 / OTH REF: 007

Card 1/1

UDC: 621.395.44:621.382.3

L 37808-66

ACC NR: AP6028829 SOURCE CODE: RU/0005/66/000/003/0105/0109

AUTHOR: Pana, Liviu (Engineer)

ORG: none

TITLE: Pulse modulation converter (amplitude-position)

SOURCE: Telecomunicatii, no. 3, 1966, 105-109

TOPIC TAGS: pulse position modulation, transistorized circuit, pulse phase modulation, electronic equipment

ABSTRACT: An analysis by classical procedures of a transformed transistorized circuit for the conversion of amplitude pulse modulation into phase pulse modulation, with special attention to the factors affecting the linearity of the modulation characteristic. A practical converter design is also presented and some data are given on its performance. Orig. art. has: 5 figures and 16 formulas. [Based on author's Eng. abst.] [JPRS: 36,644]

SUB CODE: 17, 09 / SUBM DATE: none / ORIG REF: 001 / OTH REF: 002

Card 1/1 UDC: 621.376.53/55

PANA, [illegible]

Pana, [illegible] - [illegible] measures [illegible] diffusion. [illegible]

[illegible] November [illegible], 1961.

PANA, P.

COUNTRY : [illegible]
CATEGORY :

ABS. JOUR. : Referat. Zh. 195[illegible], No. 73[illegible]

AUTHOR : [illegible] Lara, I.
INST. :
TITLE : [illegible] Drier for Drying Under Conditions of Laminar Convection by Glass

ORIG. PUB. : [illegible]

ABSTRACT : [illegible] the [illegible] of [illegible] which makes it possible to [illegible] units of [illegible]. The automatic regulation system that is used is [illegible]. Calculations of the drying process are given, which [illegible] are made by using the [illegible].
From Authors' Summary.

CARD:

PANA, Petre, [illegible] IVANICA, Alexandru, ing.

[illegible] properties of the thermal water in the Bolani [illegible] Buzau (Calnrast region). Studii si cercetari de apele meteor 10 no.1:[illegible] p. [illegible]6.

AEUREL,E.; ZERVOS,G.; TITEA,V.; PANA,S.

Immunological and therapeutic investigations in vaginal trichomoniasis. Rumanian med. rev. 7 no.4:13-19 O-D'63

PANA

(2)

RUMANIA

Prof E. ABUREL, Dr G. ZERVOS, Dr A. RUSU, Dr V. TUFEA and Dr S. PANA; First Obstetric and Gynecologic Clinic (Clinica I de obstetrica si ginecologie) "Filantropia," College of Medicine and Pharmacy, Bucharest.

"Immunology and Therapy of Trichomonas vaginalis."

Bucharest, Microbiologie, Parazitologie, Epidemiologie, Vol 8, No 2, Mar-Apr 63; pp 145-152.

Abstract [English summary modified]: Intradermal testing with antigen prepared from clinical siolate: 163 of 262 tests were positive including 16 false positives; there were also 12 false negatives. Same antigen used as vaccine by pricking intravaginal mucosa in 100 women with severe trichomonal vaginitis: excellent clinical results in 89; side effects mild: low fever in 5, slight erythema in 10. In vitro and clinical (4 patients) preliminary experiments with an effective hyperimmune serum are also reported.

1/1

PANA, Shtefan[Pana, Stefan]

Topology of dipoles. Pt. 1. Rev math pures 6 no.3:553-588 '61.

~~PANE, Stefan~~ [Pana, Stefan]

Studies on dipole topology. Pt. 2. Rev math pures 6 no.4:761-792 '61.

S/137/62/000/012/037/085
A006/A101

AUTHORS: Buzdugan, Gheorghe, [illegible] Ionisie, Antonescu, Veronel, Pană, Toma, [illegible]

TITLE: The effect of notches at [illegible] temperatures

PERIODICAL: Referativnyy zhurnal, [illegible] [illegible]riya, no. 12, 1962, 61 - 62, abstract 12I 68 ([illegible] [illegible]itexhn. București", 1961, v. 23, no. 3, [illegible] - 11[illegible]; summaries in Russian, English and French)

TEXT: The effect of notches and [illegible] concentrators upon σ_b at elevated temperatures was investigated on [illegible] and OLC 60 steel grades, corresponding to Soviet steels 5,45 and 6[illegible]. The [illegible] of stress concentrators on tensile specimens was 0.8; 1.6; 3.2; [illegible] and [illegible] and the ratio of the radius to the specimen diameter in the concentrator [illegible] was r/d = 0.1; 0.2; 0.4; 0.6, and 0.8. The specimens were tested at 20°C and [illegible] - 500°C every 50°. It was established for OL50 steel that σ_b increased initi[illegible] with higher temperature, attaining maximum values at 200°C and decreasing [illegible]dly at > 300°C. For OLC45 and OLC 60 steels, σ_b decreased initially with elevated temperatures and then increased,

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