

VASYUTINSKIY, N.A. (Zaporozh'ye); VASYUTINSKAYA, L.I. (Zaporozh'ye)

Arsenic behavior during the oxidation rolling of Kerch deposit iron ores.  
Izv. AN SSSR. Otd. tekhn. nauk. Met. i gorn. delo no.1:26-32 Ja-F '63.

(MIRA 16:3)

(Kerch Peninsula—Iron ores)  
(Arsenic)

(Ore dressing)

VASYUTINSKIY, N.A.; VASYUTINSKAYA, L.I.

Arsenic migration in the process of firing of Kevlar-epoxy iron ores.  
Zhur. prikl. khim. 37 no.8:1681-1689 Ag '64.

(MIRA 17:11)

GREBNEV, S.K.; VASYUTINSKIY, N.A.; VASYUTINSKAYA, L.I.

Nature of ferromagnetic oxidation products of siderites.  
Zhur.prikl.khim. 34 no.8:1690-1695 Ag '61. (MIRA 14:8)  
(Siderite) (Magnetite)

VASYLISHKIY, N.A.; KRIVOVA, Ye.I., 1957, No. 1, p. 165.

Structure of germanium sesquioxide. *Dokl. Akad. Nauk SSSR*, 1957, 1057-1061. (Dokl. Akad. Nauk SSSR, 1957, 1057-1061.)

1. Ukrainskiy gosudarstvennyy inzhener'nyy institut fizicheskoy metal-  
lurgii.

SAVITSKIY, I.V., VASYUTINSKAYA, Y.B.M.

Effect of aniline on certain indicators of protein metabolism  
[with summary in English]. Vop.med.khim. 4 no.5:351-358 S-O '58  
(MIRA 11:11)

1. Nauchno-issledovatel'skaya sanitarno-khimicheskaya laboratoriya  
Ministerstvo zdravookhraneniya Ukrainskoy SSR, Odessa.  
(BLOOD PROTEINS, effect of drugs on,  
aniline (Rus))  
(ANILINE DYES, effects,  
on blood proteins (Rus))

SAVITSKIY, I.V. [Savyts'kyi, I.V.]; VASYUTINSKAYA, Ye.M. [Vasiutyns'ka, Ye.M.]

Studying certain aspects of protein metabolism during aniline  
intoxication and tissue therapy. *Fiziol.zhur.* 6 no.1:101-107  
Ja-F '60. (MIRA 13:5)

1. Odesskaya nauchno-issledovatel'skaya sanitarno-khimicheskaya  
laboratoriya.

(PROTEIN METABOLISM) (TISSUE EXTRACTS)  
(ANILINE--PHYSIOLOGICAL EFFECT)

L 1977-24

ACCESSION No: AR0005741

S/0299/64/M00/013/M016/M016

SOURCE: Ref. zn. Biologiya. Evolyutsionnyy tom, Abs. 23X96

AUTHOR: Savitskiy, I. V.; Borisova, A. S.; Vasyutinskaya, Ye. M.; Savitskiy, V. I. E

TITLE: Certain metabolism link changes in the recipient's organism after homotransplantation of skin flaps

INDEX NUMBER: St. p Vses. konferentsiya po peresadke tkaney i organov, 1963. Yerevan, 1963, 430-439

TOPIC TAGS: metabolism, metabolism link, homotransplantation, transplantation, skin, rabbit, dog, preservation

TRANSLATION: Metabolism changes were investigated in rabbits and dogs with transplantation of uncharged skin and skin preservation chilling according to V. P. Filatov's method. The experiment was conducted for 10 days. The activity of enzyme carbonic dehydratase, phosphatase, and certain indices of vitamin

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L 19786-65

ACCESSION NR: AR4045761

metabolism were investigated. In the first days following transplantation, the level of serum proteins was reduced due to albumin and the globulin (gamma globulin) level increased. At later stages the globulin level decreased, particularly the alpha- and beta-fractions, and the concentration of residual nitrogen in the liver was reduced. Due to urea and amino acids in the blood serum, the level of amino acids increased in erythrocytes. Glycogen breakdown and energy rate oxidized increased. The results of the study are presented in the form of tables and graphs. The study was conducted on a group of patients with paralytic of both unchanged skin flaps and preserved skin flaps. The alpha as the result of the study is presented in the form of tables and graphs.

SUB CODE: 10

ENCL: 10

Card 2/2



VASYUTINSKIY, H. I.

USSR.

✓ Estimation of unannulated mercuric chloride and zinc  
 oxide in salves. P. O. Knizhko, A. I. Vasyutinski, R. S.  
 Vorob'eva (Odessa Pharm. Inst., Ministry of Health,  
 Ukr. S.S.R.). *Apteknoe Delo* 4, No. 1, 32-3(1955).—  
 Addn. of NaCl fixes the Hg ions and permits the titration of  
 Zn. Transfer 1/2 g. salve together with the paper on which it  
 was weighed to a 200-300-cc. flask and heat on a boiling-  
 water bath. Add 20 cc. N H<sub>2</sub>SO<sub>4</sub> and 3-4 g. NaCl and  
 continue heating until the fat and aq. layers become trans-  
 parent. Filter the cooled aq. layer through cotton, rinse  
 the fatty layer 2-3 times with 10-15 cc. water, and dil. the  
 liquid to 100 or 200 cc. Det. Zn in 20 cc. by titrating with  
 0.1N K<sub>2</sub>Fe(CN)<sub>6</sub>. Titrate another 20 cc. with 0.1N NaOH  
 and the amt. of acid consumed by ZnO and Hg.NH<sub>2</sub>Cl  
 give (A). Calc. the amt. of Hg.NH<sub>2</sub>Cl from the dif-  
 ference between (A) and the equiv. amt. of acid used by  
 ZnO. 1 cc. 0.1N H<sub>2</sub>SO<sub>4</sub> = 0.0126 Hg.NH<sub>2</sub>Cl; 1 cc. 0.1N  
 K<sub>2</sub>Fe(CN)<sub>6</sub> = 0.004030 ZnO. A. S. Mirkin.

VASYUTINSKIY, A. I.

Vasyutinskiy, A. I. -- "Study of the Influence of Substituents on Certain Analytical Properties of Benzoic Acids and the Working Out on This Basis of Methods of Quantitative Determination of Inorganic Preparations." Tartu State U, Tartu, 1955 (Dissertation for the Degree of Candidate of Pharmaceutical Sciences.)

SO: Knizhnaya Letopis', No. 24, Moscow, Jun 55, pp 91-104

AUTHORS:

Portnov, A. I., Vasyutinskiy, A. I. 75-13-3-11/27

TITLE:

The Use of 2-Sodium- Paraaminobenzoic Acid for the Titrimetric Determination of Cadmium (Primeneniye paraaminobenzoata natriya dlya titrimetricheskogo opredeleniya kadmiya)

PERIODICAL:

Zhurnal analiticheskoy khimii, 1958, Vol 13, Nr 3, pp. 319 - 322 (USSR)

ABSTRACT:

Many methods for the quantitative determination of cadmium have been described in publications (Refs 1-7). Complexometric methods for the determination of cadmium have recently grown in importance. When research was undertaken into the influence of substitutes on the solubility of the salts of benzoic acid, it was found that cadmium salts form a hardly soluble compound with 2-sodium-aminobenzoic acid. This observation led to the elaboration of a method for the quantitative determination of the cadmium. This method is based on the precipitation of cadmium by solution of 2-sodium-aminobenzoate and further bromometric determination of the remaining para-aminobenzoic acid in the precipitate. An investigation of the composition of the precipitate resulted in the following formula:

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$(\text{H}_2\text{NC}_6\text{H}_4\text{COO})_2\text{Cd}\cdot 3\text{H}_2\text{O}$ . Tests showed that the precipitation of the cadmium begins with a molar relation of Cd: 2-sodium-amino-benzoate - 1 : 1,3 and is complete at a ratio of 1:3,5. A surplus of the reagent has no influence on the accuracy of results obtained. It was further shown, that it is immaterial for the accuracy of the determination how long the precipitate is left to set. The precipitate has well set after 10 to 15 minutes and is easily filterable. Repeated washing with water gives lower results and therefore the precipitate is washed with 70% alcohol, which does not cause any decrease of results even after 10 washings. The precipitation of cadmium according to this method occurs within a pH range of 2 to 6,5 quantitatively. The exactitude of determination is of the same order as that of the gravimetric determination of cadmium according to the sulfate method. With the aid of the method described the following salts of cadmium can be determined: the acetate, the nitrate, the chloride and the iodide of cadmium. Tests have shown that zinc is not precipitated by a solution of 2-sodium-aminobenzoate. Therefore cadmium can be determined

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in the presence of zinc. It was shown, that, even in the presence of a fivefold surplus of zinc satisfactory cadmium determination can be carried out satisfactorily with this new method. There are 8 tables and 10 references, 5 of which are Soviet.

ASSOCIATION: Farnatsevticheskiy institut, Odessa (Pharmaceutical Institute, Odessa)

SUBMITTED: July 14, 1956

1. Cadmium--Determination

Card 3/3

PORTNOV, A.I.; VASYUTINSKIY, A.I.

Use of substituted phenylarsonic and benzoic acids in inorganic analysis. Trudy kom. anal. khim. 11:192-197 '60. (MIRA 13:10)

1. Odesskiy farmatserticheskiy institut.  
(Benzearsonic acid) (Benzoic acid)  
(Chemical tests and reagents)

VASYUTINSKIY, A.I. [Vasiutyns'kyi, A.I.]; KHARLAMB, A.B., student

Refractometric analysis of anesthesine ointment. *Farmatsev. zhur.*  
15 no.1:25-27 '60. (MIRA 14:5)

1. Kafedra farmatsevticheskoy khimii Zaporozhskogo farmatsevtiche-  
skogo instituta. (REFRACTOMETRY)  
(BENZOCAINE)

VASIUTINSKIY, A.I.; YEGOROVA, S.P.

Use of ammonium o-nitrobenzate in analytical chemistry.  
Zhur. anal. khim. 19 no.6:660-663 '64.

1. Odesskiy politekhnicheskiy institut. (MIRA 18:3)



AUTHORS: Amonenko, V.M., Vasyutinskiy, B.M., Lebedev, V.V. and Shapoval, B. I. SOV/126-7-6-9/24

TITLE: Vacuum Distillation of Metals with Condensation on a Heated Surface

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6, pp 862-867 (USSR)

ABSTRACT: The properties of heat-resisting alloys are influenced to a considerable extent by the purity of the starting materials. Vacuum distillation is a promising way of purifying such materials. The authors describe their use for purifying iron of the method developed in 1952 at the Fiziko-tehnicheskii institut ANU~~SSR~~ (Physico-technical Institute, Ac.Sc. Ukrainian SSR) for vacuum distillation with condensation of the metal on a surface at a high temperature. The authors consider this more efficient than published methods and they have used it successfully for purifying beryllium (Ref 5). The distillation of the iron was effected in a working vessel (Fig 1) with evacuation by an oil diffusion pump (2500 litres/sec) and a type VN-2 backing pump. Card 1/4 0.5-3 litre alundum or beryllium-oxide crucibles wound

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Vacuum Distillation of Metals with Condensation on a Heated Surface

with molybdenum or tungsten heating coils, contained the metal. The heated column directly over the crucible was generally lined with thin iron sheet, on which condensation occurred. The temperature of the column surface was chosen such that iron condensed while the impurities remained vaporized: the lower part up to 1300°C, the upper to about 1100°C. Assuming as a first approximation that the condensing metal and impurities form an ideal solid solution, the authors apply the Knudsen-Langmuir equation to calculate rates of evaporation. From a crucible at about 1580°C evaporation of metal occurred at 1 g/cm<sup>2</sup> hr., 75-80% of which was recovered at a column temperature of 1250-1300°C. Tables 1-5 show compositions before and after distillation (single and double) of armco, electrolytic (single only) and carbonyl irons, respectively. Purification from Mn, Mg, Cu, S, P, N<sub>2</sub> and O<sub>2</sub> was good and somewhat less so from aluminium. Considerable contamination from evaporation of crucible material was possible, but with double distillation the impurities could be reduced to

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Vacuum Distillation of Metals with Condensation on a Heated Surface

0.01%. The resistances of some long-needle single crystals of iron in the condensate were compared at 0°C and at low temperatures in the laboratory of B.G.Lazarev, acting member of the Ac.Sc. UkrSSR: the ratio values agree fairly closely (Table 4) with those of Meysner (Ref 6) for the purest iron and indicate that the needles were 99.996% Fe. The authors have also studied the purification of high-carbon (7% C, 73% Mn) and medium-carbon ferromanganese. The same apparatus was used, evaporation temperatures being 1100-1400°C. Rates of evaporation tended to fall through impoverishment of surface layers with manganese and formation of a graphite layer. Lower iron contents were obtained when baffles (Fig 2) were fitted in the column. On the lower baffles, kept at about 1000°C, almost all iron condensed, the manganese condensing mainly on the middle baffles (750-800°C). Table 6 shows the composition of the condensate from the third and fourth baffles. A carbon content of under  $5 \times 10^{-3}\%$  is inferred. The purity of the manganese after a single Card 3/4 distillation is over 99.96%.

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Vacuum Distillation of Metals with Condensation on a Heated Surface

There are 2 figures, 6 tables and 6 references, 3 of which are Soviet, 1 English and 1 French and 1 German.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-Technical Institute, Ac.Sc. UkrSSR)

SUBMITTED: July 22, 1957

Card 4/4

VASYUTINSKIY, B.M.; KOGAN, V.S.; KARTMAZOV, G.N.; YAKIMENKO, L.F.,  
diplomnitsa

Constitutional diagram of the nickel - chromium system. Fiz.  
met. i metalloved. 9 no. 4:558-563 Ap '60. (MIRA 14:5)

1. Fiziko-tekhnicheskiy institut AN USSR.  
(Phase rule and equilibrium)  
(Nickel-chromium alloys--Metallography)

VASYUTINSKIY, B.M.; KOGAN, V.S.

Interaction between molybdenum and chromium in nickel-saturated  
alpha, hard solutions. Fiz. met. i metalloved. 9 no.4:564-568  
Ap '60. (MIRA 14:5)

1. Fiziko-tekhnicheskiy institut AN USSR.  
(Chromium-Molybdenum steel--Metallography)  
(Phase rule and equilibrium)

VASYUTINSKIY S.H.

28441

S/185/61/006/002/016/020  
D210/D04

174430

AUTHORS: Amonenko, V.M., and Vasyutyns'kyi, B.M.

TITLE: The existence of a permeability minimum in the flow of gases through porous films

PERIODICAL: Ukrayins'kyi fizychnyy zhurnal, v. 6, no. 2, 1961, 263 - 266

TEXT: Beryllium films were obtained with the aid of precipitation of Be vapor on a molybdenum surface at  $10^{-5}$  mm Hg. The temperature of the condensation surface was varied between 400 and 750°C in different experiments. Degassing of molybdenum before condensation affects essentially the character of distribution of the pores in the film. The permeability is defined by the authors as the ratio of flow through a plate to the flow through the same area in absence of the plate. Experimental determination of permeability was made according to the formula

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D210/D304

The existence of a permeability ...

$$\gamma = \frac{\ln \frac{\Delta P_1}{\Delta P_2} \cdot V_1 \cdot V_2}{s \sqrt{\frac{RT}{2\pi p} (V_1 + V_2) \Delta t}} \quad (3) \quad X$$

$\Delta P_1$  being the decrease of pressure through the film at the beginning of the experiment,  $\Delta P_2$  the decrease at the end of the experiment,  $\Delta t$  the time of variation of the decrease from  $\Delta P_1$  to  $\Delta P_2$ ,  $V_1$  and  $V_2$  the volumes separated by the film. Measurements were made on a device not essentially different from M. Knudsen's (Ref. 1: Ann. d. Physik, 28, 75, 1909), and graphs of the dependence of  $\gamma$  on  $P$  were traced. Only one graph is given by the authors (thickness of the film approx. 100  $\mu$ ). From the relation  $l \gg \lambda \gg r$  for the transition interval ( $\lambda$  - mean free path of the molecules,  $r$  - radius of capillaries,  $l$  not defined) it is estimated

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The existence of a permeability ...

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ted that the mean radius of the capillaries is  $r < 0.5 \mu$ . From the existence of a minimum it is concluded that the pores are mostly direct canals. The permeability of films which had a minimum was always found to be small ( $10^{-4}$  -  $10^{-5}$ ). There are 2 figures and 6 references: 1 Soviet-bloc and 5 non-Soviet-bloc. The references to the English-language publications read as follows: W. Pollard, Phys. Rev., 69, 53, 1946; W. Pollard, W. Present, Phys. Rev., 73, 7, 762, 1948; Kormann, Proc. Roy. Soc., 203, 51, 1950. X

ASSOCIATION: Fizyko-tekhnichnyy instytut AN URSR, m. Kharkiv (Institute of Technical Physics, AS UkrSSR, Kharkov)

SUBMITTED: July 8, 1960

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22966

18.8200

S/126/61/011/005/014/015  
E193/E183

AUTHORS: Gindin, I.A., Starodubov, Ya.D., and Vasyutinskiy, B.M.

TITLE: Plasticity and brittleness of cast molybdenum at temperatures between 4.2 and 700 °K. I.

PERIODICAL: Fizika metallov i metallovedeniye, Vol.11, No.5, 1961, pp. 794-800

TEXT: The object of the present investigation was to explore the possibilities of low-temperature application of refractory metals such as Mo, Cr, W, Nb, etc. To this end, the mechanical properties of Mo were determined by means of the standard tensile test at 4.2-700 °K, and the effect of preliminary heat- and mechanical treatment on the transition temperature from the ductile to brittle fracture was studied. Mo of 99.95% purity was used in the experiments, the main impurities consisting of (%): 0.005 Fe; 0.01 Ni; 0.017 Ca; 0.002 Al; 0.002 O; 0.0009 N; 0.0006 H. To ensure uniform grain size, the ingots cast in vacuum-arc furnace were hot-rolled at 1000 °C to 50% reduction in thickness, spark-machining having been used for the preparation of flat, tensile test pieces of 7 mm gauge length and 2 mm<sup>2</sup> cross-section.

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Plasticity and brittleness of cast ..... S/126/61/011/005/014/015  
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After machining the test pieces were vacuum-annealed at 1280 °C. This treatment reduced the gaseous impurity content and produced a coarsely-crystalline structure with the average grain size of 200-400  $\mu$ . The tensile tests were carried out at 4.2, 20, 77, 183, 200, 223, 243, 300, 435 and 700 °K; at two rates of strain, 0.4 and 30  $\mu$ /sec. Some of the results obtained at the rate of strain of 0.4  $\mu$ /sec are reproduced in Fig.3, where the yield point ( $\sigma_s$ ), U.T.S. ( $\sigma_b$ ) and the true tensile strength ( $\sigma_u$ ) measured in kg/mm<sup>2</sup> are plotted against the test temperature (°K). It will be seen that all these properties increase with decreasing temperature. The point of intersection of the  $\sigma_s$  and  $\sigma_b$  curves determined the transition temperature from ductile to brittle fracture, which in this case was 183 °K. The unusual feature of curves shown in Fig.3 is that they all pass through a maximum at approximately 80 °K, since it is generally believed that the tensile strength in the brittle fractural region does not depend on temperature. With increasing rate of strain, both  $\sigma_s$  and  $\sigma_b$  increased, and the temperature of the transition from ductile to brittle fracture was shifted to 208 °K. The plastic properties of Mo have been found to decrease with decreasing temperature at a rate which increases with

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increasing rate of strain. This is illustrated in Fig.5, where elongation ( $\delta$ , %) and reduction of area ( $\psi$ , %) are plotted against the test temperature ( $^{\circ}\text{K}$ ) for specimens extended at 0.4 (open circles and squares) and 30  $\mu$ /sec (black circles and triangles). In the second stage of the present investigation, the tensile test pieces were subjected to the following treatment: (1) loading at room temperature and at a rate of strain of 0.4  $\mu$ /sec to attain a stress equal to  $0.5 \sigma_B$ ; (2) slow cooling under constant load to 77.2  $^{\circ}\text{K}$  and holding at that temperature for 1-1.5 hours. It was found that after this preliminary treatment, the test pieces tested at 183  $^{\circ}\text{K}$  (i.e. at the critical temperature) exhibited some degree of ductility ( $\delta$  5%). Fig.6 shows the actual load (kg) versus strain ( $\mu$ ) curves for Mo tested at 183  $^{\circ}\text{K}$  at a rate of strain of 0.4  $\mu$ /sec for untreated (curve 1) and treated (curve 2) specimens. In Fig.7 the elongation ( $\delta$ , %) of untreated (curve 1) and treated (curve 2) test pieces is plotted against the test temperature. It was found also that no significant improvement in ductility can be achieved by cooling the metal (during the treatment described above) to temperatures lower than 77  $^{\circ}\text{K}$ . An increase in

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Plasticity and brittleness of cast ... S/126/61/011/005/014/015  
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the low-temperature ductility of iron, subjected to similar treatment, has been attributed (Ref.1: Gindin, I.A., FMM, 1960, 9, 447) to the formation of twins with dislocation-free boundaries. In the case of molybdenum, the present authors postulate, the increased ductility attained by this treatment is associated mainly with the stress-dependence of the temperature coefficient of linear expansion and with the changes in the mosaic structure of the metal subjected to stresses at low temperatures. X

There are 8 figures and 8 references: 6 Soviet and 2 non-Soviet. The English language reference reads as follows:  
Ref.6: J.H. Bechtold, J. Metals, 1953, 2, 1469.

ASSOCIATION: Fiziko-tekhnicheskii institut AN USSR  
(Physico-technical Institute, AS Ukr.SSR)

SUBMITTED: August 15, 1960

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18 8200 2808, 2208, 1418, 14, 16 S/126/61/012/001/015/020  
25923 E193/E480

AUTHORS: Gindin, I.A., Staradubov, Ya.D., Vasyutinskiy, B.M.

TITLE: Metallographic investigation of molybdenum deformed in tension at 4.2 to 700°K. II

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.1, pp.132-139

TEXT: Many of the metals with body-centred cubic lattice undergo a ductile-to-brittle transition at sub-zero temperatures. It is to be expected that as the temperature of this transition is approached changes occur not only in the mechanical properties of the metal but also in its microstructure. Since no study of molybdenum at temperatures lower than 77°C had been reported, the investigation, the results of which are described in the present paper, was undertaken with the object of studying the microstructure of molybdenum deformed in tension at 4.2 to 700°K. Both optical and electron microscopes were used in the examination of the specimens. No etching was used, the changes in the microstructure on the preliminarily polished specimen surface having been revealed with the aid of a microinterferometer. Qualitative assessment was made of the density of slip bands, degree of uniformity of deformation  
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X

in different grains, mean magnitude of absolute displacement in slip, and the dependence of these characteristics on the temperature and degree of plastic deformation was evaluated. The results can be summarized as follows. (1) At all temperatures at which molybdenum remains plastic (that is down to 183°K) it deforms plastically by the mechanism of slip. As in other body-centred cubic metals, branched slip lines are formed on molybdenum, indicating a more complex mechanism of deformation than that obtaining in face-centred cubic metals. This shape of the slip lines can be observed already in the early stages of plastic deformation corresponding to an elongation of  $\delta = 1 - 2\%$ . The effect becomes more pronounced with increasing degree of deformation at any given temperature but the effect of heavy deformation is most pronounced near the ductile-to-brittle transition temperature. Fig.2 shows (magnified 330-fold) the microstructure (a) and the interference pattern (b) of the slip bands formed on molybdenum deformed at 200°K to  $\delta = 0.8\%$ ; the magnitude of the absolute slip was in this case approx 0.25  $\mu$ . In suitably oriented grains (particularly at high temperatures) a

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system of intersecting slip lines is formed. Increasing the degree of deformation of molybdenum at 240 to 700°K brings about the appearance of new slip bands and an increase in the displacement along the slip planes. The development of the process of deformation, however, is manifested predominantly by growth of the initially-formed slip bands. Thus, for example, just before the fracture of a specimen ( $\delta \approx 38\%$ ) at 700°K, the slip bands may become 6 to 7  $\mu$  wide. The density of the slip lines also changes with temperature. At 700°K, it is relatively small and slip bands, spaced at 12 to 15  $\mu$ , predominate. At 300°K, the density of slip bands corresponding to the same degrees of deformation is higher, the width of the slip bands and the spacing between them decreasing. With a further decrease in temperature, the density of slip bands again decreases approaching that obtaining at 700°K.

(2) In addition to deformation by slip (as revealed by the formation of slip bands) plastic deformation of molybdenum at room temperature entails a specific mode of deformation, localized at the grain boundaries and in the grain-boundary regions. This mechanism operates at relatively low strains (3 to 5%). With increasing strain some of the regions of localized deformation grow  
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in size and cracks are formed at the boundaries of these regions after heavy deformation. The width of these near-boundary regions can reach 25 to 30  $\mu$ , the relative displacement of adjacent grains along the grain-boundary being several tenths of a  $\mu$ . This mode of plastic deformation which has been observed in pure iron at sufficiently low temperatures (Ref.4: Gindin I.A. and Starodubov Ya.D. FTT, 1959, 1, 1794) appears to be a property of pure metals. The microstructure and interference pattern of the grain-boundary and the grain-boundary region of molybdenum, deformed at 300°K to  $\delta = 20\%$ , is shown in Fig.5a and 5b respectively (magnified 440-fold). (3) With decreasing temperature the character of plastic deformation changes considerably. At temperatures approaching the ductile-to-brittle transition, fragmentation and block formation precede the appearance of slip bands. The formation of blocks (whose size, determined with the aid of an electron microscope, was found to be  $(2 - 3) \times 10^{-4}$  cm) increases the resistance of molybdenum to slip and twinning; the process of deformation becomes less uniform and fracture takes place at relatively small strains. (4) In contrast to other metals with Card 4/9

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body-centred cubic crystal structure, twinning plays a relatively insignificant part in the plastic deformation of molybdenum. Thin twins (1 to 2  $\mu$  thick) appear in specimens deformed below 246°K but only in isolated grains. An electron microphotograph (magnified 11250 times) of a twin (approx 0.5  $\mu$  thick) in molybdenum deformed at 200°K to  $\delta = 2\%$  is shown in Fig.8. A specific characteristic of twins of this type is the presence of lightly and heavily distorted zones showing, respectively, as dark and light bands on the microphotograph. It is postulated that the highly distorted zone is formed suddenly when a certain stress, required to initiate the process of twinning, is reached. The appearance of this zone is accompanied by the formation of a mosaic structure in the boundary region and by the formation of blocks and their elastic recovery. As in the case of iron, growth of a twin in molybdenum takes place by movement of one of its boundaries; on reaching the distorted region, the growth of the twin ceases owing to the strain-hardening of this zone. (5) The specific character of plastic deformation of molybdenum is reflected in the manner in which this metal fractures. At 300 and 700°K fracture takes place along the slip planes and a well-defined neck is formed

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S/126/61/012/001/015/020  
E193/E480

in a tensile test piece. Cracks along the slip planes appear also in molybdenum, tested at 240°K, but in this case they are accompanied by cracks along the cleavage planes, the number of these cracks increasing with decreasing temperature. This is illustrated in Fig.9 (magnified 440-fold) showing a portion of a test piece deformed at 243°K to  $\delta = 18\%$  in which the parallel slip lines end at a crack along the cleavage plane. On approaching the ductile-to-brittle transition temperature, and particularly below it, cracks along the grain- and block-boundaries are formed. Side by side with the main crack a number of cracks parallel to it but not traversing the entire cross-section of the test piece can be observed. Fracture below the critical temperature is both trans- and inter-crystalline, although the latter is relatively less pronounced. The decrease in strength of molybdenum below 27°K has been attributed to the formation of a large number of surface cracks which cause premature fracture. The formation of the surface cracks is, in turn, associated with a high concentration of oxygen in the surface layer. It was concluded from the results of the present investigation that the character of plastic deformation of 99.95% molybdenum in the temperature interval  
Card 6/9

25923

S/126/61/012/001/015/020  
E193/E480

Metallographic investigation ...

studied changes considerably with decreasing temperature. In the plastic range deformation trans-crystalline slip predominates; at room temperature this mode of deformation is accompanied by localized deformation in the grain-boundary regions. On approaching the ductile-to-brittle transition temperature, block formation plays an increasingly important part and is mainly responsible for the absence of twinning at low temperature. Ductile fracture at 240 to 700°K takes place along the slip planes. At lower temperatures, cohesion of the metal is destroyed in the early stages of the deformation and the main crack develops along the block boundaries. There are 10 figures and 9 references: 5 Soviet and 4 non-Soviet. The four references to English language publications read as follows: Chen N.K., Maddin R. Trans. AIME, 1951, 191, 461; Andrade E.N., Chow J.S. Proc. Roy. Soc., 1940, 175A, 290; Cahn R.W. J. Inst. Metals, 1954-55, 83, 493; Rendall J.H., Johnstone S.T.M., Carrington W.E. J. Inst. Metals, 1953-54, 82, 345.

ASSOCIATION: Fiziko-tehnicheskii institut AN UkrSSR  
(Physicotechnical Institute AS UkrSSR)

Card 7/9

S/126/61/012/005/023/028  
E040/E435

AUTHORS: Vasyutinskiy, B.M., Kartmazov, G.N., Finkel, V.A.  
TITLE: The structure of chromium in the temperature range of  
700 - 1700°C  
PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.5, 1961,  
771-773

TEXT: Previous investigations of the crystalline structure of Ni-Cr alloys in the temperature range of 1840 to 1930°C indicated the presence of a cubic, face-centred  $\beta$ -phase of chromium and the possibility was suggested that chromium exists in five allotropic modifications. To verify these assumptions, a study was made of the crystalline structure of 80 x 10 x 2 mm chromium specimens with a purity of 99.94%. The examination was made in a high-temperature X-ray camera, which was first evacuated to  $10^{-4}$  mm Hg and then filled in with argon to the pressure of 300 mm Hg. The specimen was heated by passing through it electric current (up to 600 A). The examination was made in Cr anticathode radiation at a specimen-film distance of 60 mm, which ensured good resolution of the  $\alpha$ -doublet and enabled an accurate determination of the lattice parameter. The experimental  
Card 1/42 ✓

The structure of chromium

S/126/61/012/005/023/028  
EO40/E435

set-up was designed to facilitate reflection from the (211) plane of the body-centred chromium in the whole interval of the test temperatures. The experimental results are shown in Fig.1 and 2. The results shown in Fig.1 indicate the absence of any polymorphic transformations in pure chromium within the temperature range investigated. There are 2 figures and 14 references: 11 Soviet-bloc and 3 non-Soviet-bloc. The three references to English language publications read as follows:  
Ref.1: Bloom D.S., Grant N.J. J. Metals, v.3 (11), 1951, 1009.  
Ref.2: Abrahamson E., Grant N.J. J. Metals, v.8, 1956, 975.  
Ref.3: Stein C., Grant N.J. J. Metals, v.7, 1955, 127.

ASSOCIATION. Fiziko-tekhnicheskiy institut AN UkrSSR  
(Physicotechnical Institute AS UkrSSR)

SUBMITTED: April 19, 1961

Card 2/42

35778

S/180/62/000/001/014/014  
EO40/E135

18.1V50

AUTHORS:

Azhazha, V.M., Vasyutinskiy, B.M., and Shapoval, B.I.  
(Khar'kov)

TITLE:

Mechanical properties of high purity nickel

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Otdeleniye  
tekhnicheskikh nauk. Metallurgiya i toplivo.  
no.1, 1962, 160-161

TEXT:

Nickel of 99.98% purity (0.006% Fe, 0.003% Si, 0.001% Al) was produced using a vacuum distillation column described previously by V.M. Amonenko et al. (Ref.1: Fizika metallov i metallovedeniye, v.7, no.6, 1959, 369). Spectrochemical analysis data showed that the nickel prepared by vacuum distillation from alundum crucibles at 1480 °C had the impurities of Bi, Pb, S, Mg, Sb, Cd and P not exceeding  $3 \times 10^{-3}\%$ . Mechanical strength tests were carried out on specimens prepared from distilled nickel subjected subsequently to re-melting under vacuum. The test castings were then cold-worked to 40-50% and annealed in order to produce a grain diameter of 0.06-0.08 mm. Tensile strength specimens were  
Card 1/3

X

Mechanical properties of high ...

S/180/62/000/001/014/014  
EO40/E135

30 mm in length and 6 mm in diameter. The specimens were annealed after polishing in order to remove the effects of cold-working. It was found that in tensile tests at 20 °C high-purity Ni behaves in the same manner as pure polycrystalline Al, i.e. after formation of one or several necks further deformation proceeds by slip. Impact strength was  $> 36$  and  $> 34$  kgm/cm<sup>2</sup> at 20 and -196 °C, respectively, compared with 18.9 kgm/cm<sup>2</sup> for commercial grade Ni. Specimens were not fractured but on those tested at -196 °C clearly visible cracks were observed. The room-temperature tensile strength was 34.0 kg/mm<sup>2</sup>; yield strength 6.7 kg/mm<sup>2</sup>; elongation 63%; and Brinell hardness 56 to 58 kg/mm<sup>2</sup>. Because magnetic properties of ferromagnetic materials depend on the presence of impurities, especially gases, the ferromagnetic anomaly of ductility of high-purity nickel, which contains only a negligible quantity of gases, was expected to be indicated more clearly than in ordinary purity nickel. There are 3 figures and 2 tables.

Card 2/3



Mechanical properties of high ... S/180/62/000/001/014/014  
E040/E135

ASSOCIATION: Fiziko-tehnicheskii institut AN USSR  
g. Khar'kov  
(Physico-technical Institute AS Ukr.SSR, Khar'kov)

SUBMITTED: September 14, 1960

Card 3/3

X

*Ukrayins'kyy fizychnyy zhurnal* - AA  
S/185/62/007/006/010/014  
D407/D301

AUTHORS: Vasyutyns'kyy, B. M., Kartmazov, H. M. and Finkel',  
V.O.

TITLE: X-ray investigations of the structure of tantalum up  
to 2700°C

PERIODICAL: *Ukrayins'kyy fizychnyy zhurnal*, v. 7, no. 6, 1962,  
661-662

TEXT: In the present investigation, the temperature range is ex-  
tended beyond 2200°C. The specimens were made of tantalum wool,  
0.3 mm thick. The metal was annealed in a vacuum at 2200°C so as to  
remove gaseous impurities. The X-ray analysis was carried out in a  
high-temperature X-ray chamber in a vacuum of  $1-3 \cdot 10^{-4}$  mm Hg. The  
specimens were heated by an electric current. Only the tantalum  
line was observed over the entire temperature range; the parame-  
ters of the body-centered cubic lattice vary smoothly with tempera-  
ture. This indicates the absence of phase transitions in tantalum.  
-The temperature dependence of the lattice parameters of tantalum  
Card 1/2

X-ray investigations ...

S/185/62/007/006/010/014  
D407/D301

can be expressed by the empirical formula

$$a_{T0C} = (3.3017 + 1.4142 \cdot 10^{-5}T + 0.8660 \cdot 10^{-8}T^2)kX.$$

The coefficient of linear expansion was calculated by an approximate formula. The temperature dependence of the coefficient of linear expansion is shown in a figure. At temperatures above 2000°C the lattice parameter varies almost linearly with temperature, whereas the coefficient of linear expansion remains practically unchanged. There are 2 figures. The most important English-language reference reads as follows: J. W. Edwards, R. Speiser, H. L. Johnson, J. Appl. Phys., 22, 424, 1951.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN UkrRSR, Kharkiv (Physico-technical Institute of the AS UkrRSR, Kharkiv)

SUBMITTED: February 1, 1962

Card 2/2

S/126/62/013/002/017/019  
E039/E135

18.1135  
AUTHORS:

Vasyutinskiy, B.M., Kogan, V.S., Kartmazov, G.N.,  
and Yakimenko, L.F.

TITLE:

The formation of textured layers of nitride on  
chromium obtained by condensation in vacuum from  
the vapour phase

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.2, 1962,  
310-311

TEXT:

It is shown that the skin formed on the surface of  
chromium when heated in air or oxygen consists of two layers:  
an external layer of rhombic  $\text{Cr}_2\text{O}_3$  and an internal layer of  
hexagonal  $\text{Cr}_2\text{N}$ . This was discovered by means of X-ray diffraction  
measurements. The structure of the skin formed on chromium when  
heated in air and in nitrogen up to  $1300^\circ\text{C}$  was examined for two  
different samples: one was chromium cast and rolled in vacuum,  
and the other a sample of chromium obtained by condensation from  
the vapour phase. This condensation was carried out at a  
pressure of  $10^{-3}$  mm Hg on to a molybdenum plate over a period of  
Card 1/2

The formation of textured layers ... S/126/62/013/002/017/019  
E039/E135

10-15 hours forming a layer 300-500  $\mu$  thick. This layer was then annealed in air for 450 hours. The skin formed was studied by means of X-ray diffraction using  $K_{\alpha}$ -Cr radiation to improve definition. Maximum reflection from the (110) plane was obtained with the sample placed at 56° to the incident beam, indicating that the nitride is orientated with the (110) plane parallel to the surface. In the case of chromium cast and rolled in a vacuum at a temperature of 1100 °C no structure corresponding to the nitride layer was discovered; similarly, chromium cast and rolled in air and in nitrogen at a temperature of 900-1200 °C showed no structure. It is observed that the structured layer of nitride on the chromium condensed from the vapour phase is much more firmly bonded to the outer oxide layer than in the case of the structureless nitride on cast chromium from which the oxide layer is easily separated.

ASSOCIATION: Fiziko-tekhnicheskii institut AN UkrSSR  
(Physicotechnical Institute, AS UkrSSR)

SUBMITTED: May 22, 1961

Card 2/2

VASYUTINSKIY, B.M.; KOGAN, V.S.; KARTMAZOV, G.N.; YAKIMENKO, L.F.

Formation of textured nitride layers on chromium obtained by condensation in vacuum from the vapor phase. Fiz. met. i metalloved. 13 no.2:310-311 F '62. (MIRA 15:3)

1. Fiziko-tekhnicheskiy institut AN USSR.  
(Vapor plating) (Chromium--Metallography)

VASYUTINSKIY, B.M.; KARTMAZOV, G.N.; FINKEL', V.A.

Obtaining filiform crystals of chromium. Fiz.met.i metalloved.  
14 no.5:792-793 N '62. (MIRA 15:12)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.  
(Chromium) (Crystallization)

VASYUTINSKIY, B.M.; KARTMAZOV, G.N.

Mechanism of nickel oxidation. *Fiz.met.i metalloved.* 15 no.1:  
132-134 Ja '63. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.  
(Nickel) (Oxidation)



AMONENKO, V.M.; VASYUTINSKIY, B.M.; KARTMAZOV, G.N.; SMIRNOV, Yu.N.;  
FINKEL, V.A.

Investigating the structure of tantalum at high temperatures.  
Fiz.met.1 metalloved. 15 no.3:444-450 Mr '63. (MIRA 1644)

1. Fiziko-tehnicheskiy institut AN UkrSSR.  
(Tantalum--Testing) (Metals at high temperatures)

L 17700-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(b) IJP(c)/ASD(m)-1 JU/JG

ACCESSION NR: AP4042048

S/0126/64/017/006/0892/0897

AUTHOR: Vasyutinskiy, B. M.; Kartmazov, G. N.; Papirova, I. I.

TITLE: Surface structure and properties of acicular crystals of chromium <sup>B</sup>

SOURCE: <sup>21</sup> Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 892-897

TOPIC TAGS: acicular crystal, whisker surface structure, chromium strength, growth mechanism, chromium

<sup>18</sup> ABSTRACT: Pointing out that the formation and growth of acicular crystals is far more complex than indicated by earlier investigators, the authors discuss surface structure, strength characteristics, and growth mechanism of Cr crystals with a maximum cross section of  $20 \times 10^{-6} \text{ mm}^2$  produced by vacuum condensation. Examination under a standard optical microscope showed that crystals grow in steps; the mean height of individual steps varied from 1700 to 2300 Å. The growth begins at the basal face and proceeds toward the apex. Under

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L 17700-65

ACCESSION NR: AP4042048

2

an electron microscope stepped and complex profiles as well as smooth surface regions were also identified. Failure in tensile tests occurred by a cleavage and was not preceded by conspicuous plastic deformation. Investigations showed that the thicker crystals had a lower strength. The strength reached  $590 \text{ kg/mm}^2$  in crystals with macroscopic growth steps. Since appreciable strength was observed in crystals both with a smooth surface and with growth steps, the authors assume that the latter are not formed as a result of dislocation. The discontinuation of axial growth is attributed to the mechanism of the development of steps on the lateral face. Apparently, with each new layer that forms at the basal face and reaches the apex, the supply of crystallizing substance to the mobile whisker end is reduced by the diffusion of particles toward the step of the next layer. This was corroborated by the fact that thin crystals possess a smaller number of growth steps than thick specimens formed under analogous conditions. Moreover, the same crystal may be rather smooth near the apex and rough in the thicker portion. The changes in the axial growth under conditions of temperature control were caused by the changes in the growth mechanism. The contribution of A. A. Chernov is gratefully acknowledged. Orig. art. has: 4 figures, 2 formulas, and 1 table.

Card 2/3

L 17700-65

ACCESSION NR: AP4042048

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical  
Institute, AN UkrSSR)

SUBMITTED: 03Jul63

ENCL: 00

SUB CODE: SS, IC

NO REF SOV: 005

OTHER: 010

Card 3/3

ACCESSION NR AP5017261

MP/0181/65/007/007/1944/1951

AUTHOR: Shvachko, V. I.; Nadykto, B. T.; Fogell, Ya. M.; Vasyutinskiy, B. M.;  
Kartmazov, G. N.

TITLE: Using secondary ion-ionic emission<sup>11</sup> for studying the interaction of oxygen  
with the surface of niobium<sup>27</sup>

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 1944-1951

TOPIC TAGS: ion emission, niobium, oxidation

ABSTRACT: The method of secondary ion-ionic emission was used to investigate the composition of oxides which form on the surface of niobium when it interacts with oxygen. It was established that in the temperature range from 20 to 1200°C the following oxides form on the surface of niobium which is in an oxygen atmosphere at a pressure of approximately  $10^{-4}$  mm of mercury: NbO, NbO<sub>2</sub>, Nb<sub>2</sub>O<sub>3</sub>, and Nb<sub>2</sub>O<sub>5</sub>. In the temperature interval from 1200 to 2000°C the surface of Nb contains only NbO and Nb<sub>2</sub>O<sub>3</sub>. The corrosion wear of Nb results from the formation and subsequent evaporation of NbO starts at 1400°C and then increases very rapidly with temperature. In the 20-800°C temperature range NbO<sub>2</sub> undergoes decomposition according to the reaction NbO<sub>2</sub> = NbO + O with the desorption of oxygen into a gaseous phase. "In conclu-

Card 1/2

L 58872-65

ACCESSION NR: AP5017281

sion, we are sincerely grateful to A. K. Val'ter for his constant interest in the work." Orig. art. has: 4 figures. 2

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Kharkov State University)

SUBMITTED: 27Nov64

ENCL: 02

SUB CODE: CC, MM

NO REF: 00

Card 2/2 *hjo*

L 28108-66 EWT(r)/EPP(r)-2/EAP(r)/ETI ISP(c) JDA/M/13/35  
AGC NR: AT5027942 SOURCE CODE: UR/0000/65/000/000/C077/0082

AUTHOR: Ivanov, V. Ye.; Nechiporenko, Ye, P. (Dr. of Technical Sciences); Osipov, A. D.; Vasyutinskiy, B. M.; Kartmazov, G. N. 71

671

ORG: none

TITLE: Thermal stresses in chromium coatings on molybdenum 27

SOURCE: Seminar po zharostoykim pokrytiyam. Leningrad, 1964. Zharostoykiye pokrytiya (Heat-resistant coatings); trudy seminara. Leningrad, Izd-vo Nauka. 1965, 77-82

TOPIC TAGS: chromium plating, vapor plating, molybdenum, heat effect, internal stress, adhesion, thermal stress

ABSTRACT: Previous studies (FMM, IX, 4, 558, 1960) showed that coatings obtained by the condensation in vacuum of Cr vapors on the surface of Mo samples had good protective properties, but that their service life decreased considerably when they were subjected to temperature fluctuations. A study was made on the effect of temperature on internal stresses in chromium coatings on molybdenum produced

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L 28408-66

ACC NR: AT5027942

in various vacuum conditions and having various strengths of adhesion of the coating to the substrate. The value of stress ( $\sigma$ ) was determined from changes in the deflection ( $d$ ) of the plated samples ( $100 \times 5 \times 2\text{mm}$ ) by using the formula  $\sigma = 4 E h_2^3 d / 3 l^2 h_1 (h_1 + h_2)$ , where  $E$  is the Young modulus,  $l$  is the length of the coated part of the sample, and  $h_1$  and  $h_2$  are the thicknesses of the coating and the base metal, respectively. The curves of deflection (in mm) vs temperature were plotted during the experiments. The changes in the slope of the curves (inflections), corresponding to the conversion of elastic into nonelastic deformations, were observed during heating and cooling of the samples. Nonelastic deformations in the low-temperature range ( $\leq 400^\circ\text{C}$ ) were formed at the critical stress  $\sigma = 8 \text{ kg} / \text{mm}^2$ . The value of the critical stress could be controlled either by the deformation of the coating itself or by the strength of adhesion of the coating to the substrate. Experiments with the coatings of various degrees of adhesion strength (strength of adhesion was changed by applying the coatings to the surface of Mo oxidized to various degrees, or by increasing the roughness of the Mo surface) proved that the value of the critical stress did not depend on the adhesion strength and was controlled by the deformation of the coating itself. The adhesion strength of coatings applied to the surfaces of oxidized

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L 28408-66

ACC NR: AT50279A2

and nonoxidized Mo were about the same and were similar to the strength of the coating. The curves plotted for the temperature range of 100 - 1000C for the coatings applied under various values of vacuum ( $10^{-3}$  -  $10^{-5}$  mm Hg) showed that the samples produced in  $10^{-3}$  vacuum failed at smaller  $\sigma$  than the samples coated in the higher vacuum. Orig. art. has: 4 fig.

SUB CODE: 20/ SUBM DATE: 20Jul65/ ORIG REF: 003

Card 3/3 *IC*

L 19581-63 EPR/EPF(c)/EWP(q)/EWT(m)/EWP(B)/BDS AFFTC/ASD Pr-4/  
Ps-4 WNI/JD/WH/JG/K/MLK(a) S/0286/63/000/010/0072/0072  
ACCESSION NR: AP3007610

AUTHOR: Vasyutinskiy, B. M.; Kogan, V. S.; Lazarev, B. G.;  
Lazareva, L. S. 363

TITLE: Tinplating of graphite. <sup>15</sup> Class 48, No. 154752 <sup>15</sup>

SOURCE: Byul. izobret. i tovarny\*kh znakov, no. 10, 1963, 72

TOPIC TAGS: graphite tinning, graphite tinplating, vacuum tinning,  
vacuum tinplating, carbide forming additives, tin coat

ABSTRACT: A patent has been issued for a method of tinning graph-  
ite parts by immersing them in molten tin. To obtain a high-  
quality tin coat, the tinning process is carried out in vacuum at  
1000C with a maximum of 0.01% tungsten, molybdenum, titanium,  
zirconium, or other carbide-forming metals added to the tin bath.

ASSOCIATION: none 27

SUBMITTED: 21Jun62

DATE ACQ: 14Oct63

ENCL: 00

SUB CODE: ML

NO REF SOV: 000

OTHER: 000

L 10441-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6023705 SOURCE CODE: UR/0126/66/021/004/0620/0621 53

AUTHORS: Vasyutinskiy, B. M.; Kartmazov, G. N.; Smirnov, Yu. N.; Finkel', V. A.

ORG: Physico-Technical Institute, AN UkrSSR (Fiziko-tehnicheskiy institut AN UkrSSR)

TITLE: Investigation of the crystalline structure of niobium and vanadium at high temperatures

SOURCE: Fizika metallov i metallovodeniye, v. 21, no. 4, 1966, 620-621

TOPIC TAGS: niobium, vanadium, x ray spectroscopy, crystal lattice parameter

ABSTRACT: The crystal structure of niobium and vanadium was determined as a function of the temperature. The experimental procedure was described earlier by V. M. Amonenko, B. M. Vasyutinskiy, G. N. Kartmazov, Yu. N. Smirnov, and V. A. Finkel' (FMM, 1963, 15, 444). The experimental results are presented graphically (see Fig. 1). It was found that the temperature dependence of the lattice parameters obeyed the following relationship

$$a_{T=0}^{Nb} = 3,3001 (1 + 7,223 \cdot 10^{-6} T + 7,867 \cdot 10^{-10} T^2) \text{ \AA};$$

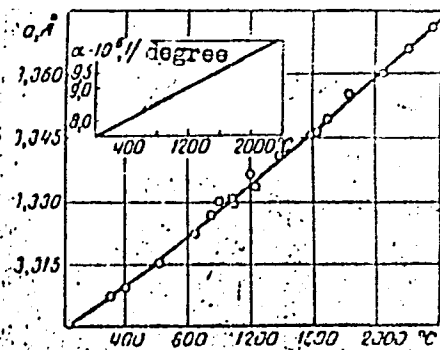
$$a_{T=0}^{V} = 3,0200 (1 + 7,314 \cdot 10^{-6} T + 2,944 \cdot 10^{-10} T^2) \text{ \AA}.$$

Card 1/2 UDC: 548.0:546.881/882

L 1044-67

ACC NR: AP6023705

Fig. 1. Temperature dependence of the lattice parameter and coefficient of linear expansion of niobium crystal lattice



Orig. art. has: 2 graphs and 2 equations.

SUB CODE: 11/20/ SUBM DATE: 02Aug65/ ORIG REF: 001/ OTH REF: 004

Card 2/2 <sup>670</sup>

ACC NR: AT7004209

SOURCE CODE: UR/0000/66/000/000/0121/0127

AUTHORS: Kogan, V. S.; Vasyutinskiy, B. M.; Lazarev, B. G.

ORG: none

TITLE: Studying phase diagrams with the use of diffusion layers,

SOURCE: AN SSSR. Institut metallurgii. Eksperimental'naya tekhnika i metody vysokotemperaturnykh izmereniy (Experimental techniques and methods of high temperature measurement). Moscow, Izd-vo Nauka, 1966, 121-127

TOPIC TAGS: metal phase system, metal vapor deposition, metallographic examination, nickel, chromium, molybdenum, niobium, tin, iron, tantalum

ABSTRACT: The obtaining of metal phase diagrams by a multilayer technique is described. The technique, an extension of the work of L. S. Palatnik, V. M. Kosevich, and L. V. Tyrina (FMM, 1961, 11, 229), consists of condensing an appropriate metallic vapor mixture and of subsequently preparing a thin polished section from the condensate. This technique was applied to the study of the phase diagrams of the following systems: Cr-Ni, Nb-Sn, Fe-Ta, and Mo-Cr-Ni. The experimental results, shown graphically (see Fig. 1), were published earlier in three communications by B. M. Vasyutinskiy and V. S. Kogan (FMM, 1960, 9, 564). In addition, x-ray powder pictures were taken and the microhardness of the specimens was determined. The results are shown graphically. It is concluded that the condensation-diffusion layer

Card 1/2

ACC NR: AT7004209

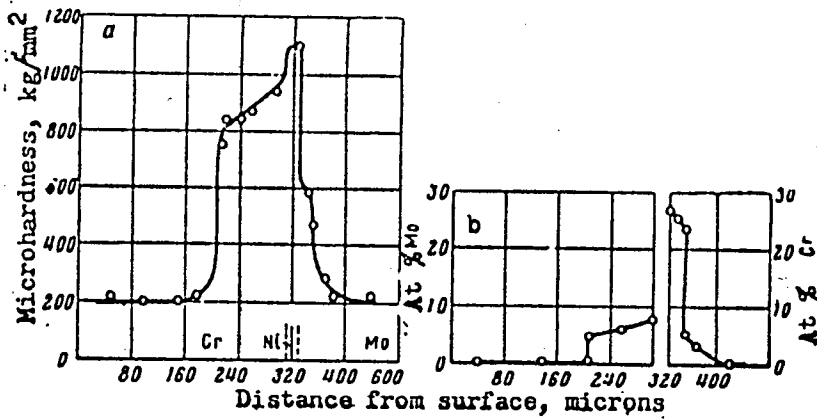


Fig. 1. Microhardness curves (a) and composition of the  $\alpha$ -solid function (b) of the system Mo-Cr-Ni, as a function of the distance from the surface layer of a specimen

technique is not capable of yielding the complete phase diagram for the system and that it requires, for successful application, some preliminary knowledge about the system. The Nb-Sn system was studied by V. S. Kogan, B. G. Lazarev, L. S. Lazareva, A. I. Krivko, and A. A. Matsakova.. Orig. art. has: 5 graphs.

SUB CODE: 11/

SUBM DATE: none/

ORIG REF: 012/

OTH REF: 006

Card 2/2

PROKURATOV, A.M.; VASYUTINSKIY, G.N.

Efficient use of locomotives. Blok. i tepl. tiaga no. 3:1-3 Mr '57.  
(MLRA 10:6)

1. Nachal'nik sluzhby lokomotivnogo khozyaystva Sverdlovskoy dorogi  
(for Prokuratov). 2. Glavnyy inzhener sluzhby lokomotivnogo kho-  
zyaystva (for Vasyutinskiy).  
(Locomotives)

VASYUTINSKIY, G.N., inzh.; VINOGRADOV, Yu.N., inzh.; DUDYREV, A.K., inzh.

Experience in the organization of the current maintenance of electric locomotives using the shift system on the Ural and Sibiria railroads. Trudy TSNII MPS no.246:5-39 '62.

(MIRA 16:2)

(Electric locomotives--Maintenance and repair)



VASVUTINSKIY, N.A. (Kerch'); GRENDEL', S.K. (Kerch')

Reduction of Kerch iron ores containing organic substances.  
Izv. AN SSSR. Otd. tekhn. nauk. Met. i topl. no.1:149-151 Ja-F  
'61. (MIRA 14:2)  
(Kerch Peninsula--Iron ores)  
(Iron--Metallurgy)

VASYUTINSKIY, N.A.

Microhardness of Kerch deposit sinters. Stal' 21 no.2:105-106 P '61.  
(MIRA 14:3)

1. Institut mineral'nykh resursov AN USSR.  
(Kerch Peninsula--Iron ores) (Sintering)  
(Hardness)

VASYUTINSKIY, N.A.

Optimum degree of reduction in the magnetizing roasting of  
iron ores. Stal' 21 no.10:878-881 0 '61. (MIRA 14:10)

1. Kamyshburunskiy zhelezorudnyy kombinat.  
(Iron ores) (Cre dressing)

GREBNEV, S.K.; VASYUTINSKIY, N.A.; VASYUTINSKAYA, L.I.

Nature of ferromagnetic oxidation products of siderites.  
Zhur.prikl.khim. 34 no.8:1690-1695 Ag '61. (MIRA 14:8)  
(Siderite) (Magnetite)

VASYUTINSKIY, N.A.

Magnetite from agglomerates of Kerch iron ores. Zap.Vses.min.ob-va  
90 no.6:731-735 '61. (MIRA 15:2)  
(Kerch Peninsula--Magnetite)

НАУЧНО-ТЕХНИЧЕСКИЙ, И.А.; НЕВОДА, Г.С.

Some specific features of arsenic distribution in the iron ores  
of Kerch. Dokl. Akad. Nauk SSSR 141 no.1:197-201, 1961.

(TIB 14:11)

1. Научно-технический журнал. Представлено  
академиком И.А. Страйковом.

(Kerch Peninsula--Iron ores)  
(Arsenic)

VASYUTINSKIY, N.A. (Kerch'); VASYUTINSKAYA, L.I. (Kerch')

Arsenic adsorption by coal during the reduction of Kerch iron  
ores. Izv. AN SSSR. Otd. tekhn. nauk. Met. i topl. no.2:22-26  
Mr-ap '62. (MIRA 15'4)

(Iron--Metallurgy) (Adsorption)

GREBNEV, S.K.; VASYUTINSKIY, N.A.

Specific magnetic susceptibility of powders with a various magnetite content. Obog.rud. 7 no.1:54-55 '62. (MIRA 15:3)

1. Kerchenskaya obogatitel'naya fabrika.  
(Metal powders--Magnetic properties) (Magnetite)



VASYUTINSKIY, N.A. (Zaporozh'ye); VASYUTINSKAYA, L.I. (Zaporozh'ye)

Arsenic behavior during the oxidation rolling of Kerch deposit iron ores.  
Izv. AN SSSR. Otd. tekhn. nauk. Mat. i gor. delo no.1:26-32 Ja-F '63.  
(MIRA 16:3)

(Kerch Peninsula—Iron ores)  
(Arsenic)

(Ore dressing)

VASYUTINSKIY, N. A. (Zaporozh'ye)

Characteristics of the reduction of Kerch ores. Izv. AN SSSR.  
Met. i gor. delo no.1:20-25 Ja-F '64. (MIRA 17:4)

VASYUTINSKIY, N.A. (Zaporozh'ya)

Conditions for the formation and the thermal stability of maghemite.  
Izv. AN SSSR. Otd. tekhn. nauk. Met. i gor. delo no.4:39-45 J1-Ag  
'63. (MIRA 16:10)

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1. Ukrainsky vovnarstvennyy pryvodynyy instytut tekhnoy  
metallurgiyi.

VASYUTINSKIY, N.A.; VASYUTINSKAYA, L.I.

Arsenic migration in the process of firing of Kevonensk iron ores.  
Zhur. prakt. khim. 37 no.8:1681-1689 Ag 16A.

(KIRA 17:11)

VASYUTINSKIY, N.A. (Zaporozh'ye); MOVSESOV, F.Ye. (Zaporozh'ye)

Studying the process of titanium slag oxidation. Izv. AN  
SSSR, Met. no.1:82-87 Ja-F '65. (MIRA 13:5)

L 3498.66 EWT(m)/T/EMP(t)/EWP(b)/EWA(o) IJP(c) JD

ACCESSION NR: AP5024860

UR/0136/65/000/010/0070/0071  
669.295:620.18

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AUTHOR: Vasyutinskiy, N. A.; Rya'yeva, Yu. I.; Rodyakin, V. V.; Chernysheva, S. P.; Kushkin, B. N.

44,55 44,55 44,55 44,55

TITLE: Metallographic investigation of porosity in magnesium-reduced titanium sponge

44,55 27

SOURCE: Tavetnyye metally, no. 10, 1965, 70-71

TOPIC TAGS: titanium, sponge metal, porous metal, porosity, metal grain structure, metal recrystallization

ABSTRACT: The structure of the titanium sponge produced by reduction with magnesium affects markedly the process of the vacuum separation of the sponge and particularly the degree of elimination of certain impurities. However, the available data on the porosity of Ti sponge are relatively limited, and besides the study of the structure of this sponge cannot be confined to porosity alone, since the internal structure of the sponge, i.e. its microcrystalline structure, also is of interest. Accordingly, the authors present the results of a metallographic in-

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investigation by means of which new findings on this subject have been obtained. Specimens of Ti sponge were microscopically examined following their treatment with pore-filling rosin and subsequent polishing with abrasive powders and etching for 1 min in a solution of 10 cc HF, 30 cc HNO<sub>3</sub> and 50 cc H<sub>2</sub> at room temperature for 1 min. The specimens pertained to three different sponges produced at different rates of feed of TiCl<sub>4</sub> to the reactor. Findings: in sponge 1 (TiCl<sub>4</sub> feed rate: 150 kg/m<sup>2</sup>-hr) irregularly shaped pores of from 40-60 to 100-150 μ predominate, with most of the pores having smooth (round) contours; in sponge 2 (TiCl<sub>4</sub> feed rate: 230 kg/m<sup>2</sup>-hr) the micropore size is more uniform; in sponge 3 (TiCl<sub>4</sub> feed rate: 320 kg/m<sup>2</sup>-hr) the micropore size is from 5 to 250 μ and the size distribution is as irregular as in sponge 1. On the whole, sponge porosity increases with increasing TiCl<sub>4</sub> feed rate, while at the same time the character of pores changes -- they become more irregularly shaped, with "lacerated" contours. This indicates an increase in the crystallization rate of Ti and a decrease in the effectiveness of recrystallization processes. Sections of sponge 1 reveal two basic structural varieties of the α-modification of Ti -- polyhedral (mostly equiaxial from 20-30 to 100-150 μ) and elongated acicular grains; this pattern is less distinctive for sponge 2. The visually observable dendrites of the titanium sponge proved, on microscopic examination, to have a polycrystalline structure, they

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ACCESSION NR: AP5024860

clearly underwent complete recrystallization, i.e. only the external remains of dendritic structures have survived. It is thus concluded that the change in the rate of feed of  $TiCl_4$  to the reactor not only alters the extent and character of porosity of the sponge but also is accompanied by changes in the micro-structure of Ti itself. It should be considered that the sponge investigated was subjected to the vacuum separation process, and hence the changes in sponge structure that were caused by change in the regime of reduction were offset to some extent by the subsequent changes in the structure of the sponge during its separation. Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM.

NO REF SOV: 005

OTHER: 000

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3/3

DP

VASYUTINSKIY, N.A.; MIKRO V.I.; RYS'YENKA, Yu.I.

Crystal lattice of ethion monoxide produced in a plasma  
reactor. Izv. AN SSSR. Neorg. mat. 1 no.6:835-837 Je '65.  
(MIRA 18:8)

1. Ukrainskiy gosudarstvennyy proyektnyy institut tsvetnoy  
metallurgii.

VASYUTINSKIY, N.A.; DENISOV, S.I.; KYSIYENVA, Yu.I.

Studying phase transformations during the heating of foreign  
kaolin. Ogneupory 29 no.10:466-471 U.S. (MIRA 18:7)

1. Ukrainskiy gosudarstvennyy proyektnyy institut fizicheskoy  
metallurgii.

VASYUTINSKIY, N.A.

Urgent problems in improving methods used to decrease the morbidity of collective farm workers and loss of labor in agriculture. Sov. med. 18 no.10:33-36 O '54. (MLRA 7:11)

1. Iz kafedry organizatsii zdravookhraneniya Kiyevskogo instituta usovershenstvovaniya vrachey.

(AGRICULTURE,

accid., prev. & control in Russia)

(ACCIDENTS,

agriculture, prev. & control in Russia)

(PUBLIC HEALTH,

in Russia, decrease of morbidity rate in agricultural workers)

DUPLLENKO, K.F.; VASYUTINSKIY, N.A.; SIDORENKO, G.M.; GRANDO, A.A.

"Public health organization in the U.S.S.R.," edited by N.A.  
Vinogradov. Reviewed by K.F. Duplenko and others. Sov.zdrav.  
18 no.7:42-45 '59. (MIRA 12:9)  
(PUBLIC HEALTH) (VINOGRADOV, N.A.)

NIKITIN, A.I.; VASYUTINSKIY, N.N.; DNEPROVSKIY, V.Ya.

Devices for noncontact measurements of wall thickness of very thin-walled pipes. Avtom. 1 prib. no.2:34-36 Ap-Je '65. (MIRA 18:7)

VASYUTENSKIY, S. B.

The following is among dissertations of the Leningrad Polytechnic Institute imeni Kalnin:

"Electromagnetic Processes of Rectifying and Inverting Circuits of Ionic Inverters with the Use of Filters in the Circuit of the Rectified Current." 12 December 1949. An examination is made of current rectifying and inverting processes in an inverter is connected, in accordance with a three-phase bridge circuit with bunching parameters, in the circuit of the pulsating current and which is provided with parallel-connected, two-element resonance circuits on the side of the pulsating current.

SO: M-1048, 28 Mar 56

VASYUTINSKIY, S. B.

110-10-8/18

AUTHOR: Vasyutinskiy, S.B., Candidate of Technical Sciences and  
Pagayenko, G.P., Engineer.

TITLE: The Thermal Design of Current-carrying Pipes. (Teplovoy  
raschet tokovedushchikh trubok)

PERIODICAL: Vestnik Elektromyshlennosti, 1957, Vol.28, No.10,  
pp. 44-47 (USSR)

ABSTRACT; Hollow pipes are often used as current conductors where they can reduce the skin effect or are required for the passage of water or other fluids for cooling. At the present time there is no complete thermal design procedure for current-carrying pipes with liquid cooling that takes account of such factors as heating of the liquid along the pipe, the change of the resistance of the material of the pipe with temperature along its length and the thermal conductivity of the pipe. The procedure here proposed is valid with any cooling fluid and in particular water. The steady state conditions of a hollow pipe of given external and internal diameters and length are considered. It is assumed that all the heat generated in the pipe is removed by the water and that there is no heat exchange between the pipe and the surrounding medium.

An equation is formulated for the quantity of heat generated in unit time in a short element of pipe and a heat

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The Thermal Design of Current-carrying Pipes.

110-10-8/18

balance equation is derived. The equations are solved and it is shown that thermal design of current-carrying pipes with allowance for thermal conductivity is not fundamentally difficult although it requires laborious calculations. The presence of thermal conductivity leads to some equalisation of temperature along the length of the pipe, which is small when the pipe is long and of small cross-section. With pipes that are several metres long and with a cross-section of several square mm the influence of thermal conductivity may be neglected. This simplifies the equations and it is shown that in this case the temperature distributions in the pipes and water follow an exponential law. The expressions can be still further simplified if the temperature coefficient of resistance of the pipe is ignored and the specific resistance is chosen to correspond with the temperature of the middle of the pipe.

The procedure described was used to make a large number of thermal calculations on current-carrying pipes. It may be concluded that, by neglecting the change of specific resistance with temperature along the pipe, errors of not more than 10% are introduced if the specific resistance is related to the arithmetic mean temperature of the pipe. If the thermal

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The Thermal Design of Current-carrying Pipes.

110-10-8/18

conductivity of the material is ignored the error is usually not more than 1 - 2%. It is therefore recommended that in making preliminary thermal calculations on current-carrying pipes use be made of the existing procedure, whilst calculations made for checking purposes should allow for the temperature change of specific resistance of the material of the pipe and in particularly important cases allowance should also be made for the thermal conductivity of the material. An appendix gives a numerical example of a thermal calculation of the kind described.

There is 1 figure.

ASSOCIATION: Leningrad Polytechnical Institute (Leningradskiy Politekhnicheskiy Institut)

SUBMITTED: September 11, 1956

AVAILABLE: Library of Congress

Card 3/3

VASYUTINSKIY, S.B.; NAGAYENKO, G.P.

Designs and basic equations of electrodynamic vibrators. Trudy LPI  
no.192:141-153 '58. (MIRA 11:6)  
(Vibrators)

VASYUTINSKIY, S. B., HAGAYENKO, G. P.

"Design Diagrams and Basic Equations of Electrodynamic Vibrators."

(Dynamics and Strength of Machines; Collection of Articles) Moscow, Mashgiz,  
1958. (Series: Its: Leningrad Polytech Inst. Trudy, No. 192) 234 p.

8(2)

SOV/103-59-3-8/27

AUTHORS:

Vasyutinskiy, S. E., Candidate of Technical Sciences,  
Nagayenko, G. P., Engineer, Fedorishin, M. I., Engineer

TITLE:

Shielding Solid Steel Parts of a Vibration Test Stand Against Alternating Magnetic Fields (Ekranirovaniye stal'nykh massivov vibrostenda ot peremennogo magnitnogo polya)

PERIODICAL:

Elektrichestvo, 1959, Nr 3, pp 37 - 41 (USSR)

ABSTRACT:

This is a description of an electrodynamic vibration test stand. If in such a test stand copper shields in the form of short-circuited rings are installed, which cover the surface of the core of the annular pole in those places, where the movable winding is located, this will lead to a considerable reduction of the active and reactive power output. No reduction, however, of the mechanical force developed by the test stand will occur due to this measure. By a table it is shown that the application of shields leads to a reduction of the power drawn by the test stand from the supply grid by a factor of 4.23 and to a reduction of the active power in the iron by a factor of 11.5. The copper losses in the movable winding have been reduced by the application of shields.

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Shielding Solid Steel Parts of a Vibration Test Stand  
Against Alternating Magnetic Fields

SOV/100-50-3-8/27

The calculation of apparatus similar to test stands without shields is very complicated. It can be simplified if it is assumed that if shields are used the magnetic alternating field does not enter the iron core. This assumption has been proved right by experiment. It was shown that with shields the magnetic alternating flux at the core surface is generated by a magnetizing force, which is only 5-10% of the magnetizing force of the movable winding. In this case a system composed of a movable alternating current winding and of short-circuited shields can with sufficient accuracy be looked upon as an air transformer with three windings and short-circuited secondary windings. Equations (1), (2) and (3) are written down, specifying the EMF of the windings. The solutions of these equations give the voltage at the movable winding and the amperages in the shields. The active power is computed according to equation (7), and the intrinsic losses in the movable winding according to equation (8). In order to check this method of computing the shields and of estimating the efficiency of shielding experiments were carried out at a model test stand of the Leningradskiy politekhnicheskii

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Shielding Solid Steel Parts of a Vibration Test Stand  
Against Alternating Magnetic Fields

SOV/105-59-3-9/27

institut (Leningrad Polytechnical Institute). The results obtained and the results advanced in this paper demonstrated that a shielding of iron cores by copper shields in installations as described here is very effective. A shielding of iron cores is particularly expedient for high frequency. The experiments carried out substantiated the correctness of the method advanced in this paper of the electromagnetic calculation of apparatus, which are similar to the electro-dynamical vibration test stand and which are equipped with a magnetic shielding against magnetic alternating fields. There are 7 figures, 1 table and 3 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskoy institut im. Kalinina (Leningrad Polytechnical Institute imeni Kalinin)

SUBMITTED: November 10, 1958

Card 3/3

VASYUTINSKIY, S.B.

PHASE I BOOK EXPLOITATION SOV/4917

Piotrovskiy, Lyudvig Marianovich [Deceased], Svyatoslav Borisovich Vasyutinskiy, and Elena Dmitriyevna Nesgovorova

Ispytaniye elektricheskikh mashin. Chast' 2: Transformatory i asinkhronnyye mashiny (Testing Electric Machinery. Pt. 2: Transformers and Induction Machines) Moscow, Gosenergoizdat, 1960. 290 p. Errata slip inserted.

Ed.: A.S. Usser; Tech. Ed.: O.S. Zhitnikova.

PURPOSE: This book is a teaching aid for students working in electrical laboratories in power-engineering and electrical-engineering schools of higher education. It can also be of use to electrical engineers concerned with the testing of electrical machines.

COVERAGE: The book covers the testing of transformers and "collectorless" induction machines of various types for diverse operating conditions. Related general problems are presented. The manual also includes a description of the industrial testing of these machines carried out in accordance with the All-Union State Standards (GOST) now in force. The first section of the book was

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Testing Electric Machinery (Cont.)

SOV/4917

written by L.M. Piotrovskiy and S.B. Vasyutinskiy; the second by L.M. Piotrovskiy and Ye.D. Nesgovorova. The authors thank A.I. Vazhnov, P.Yu. Kaazik, and M.I. Fedorishin. There are 44 references: 38 Soviet, 3 German, and 3 English.

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VASYUTINSKIY, S.B., inzh.; NAGAYENKO, G.P., inzh.

Determination of the principal dimensions of electrodynamic  
vibrators. Vest. elektroprom. 32 no.10:73-75 O '61. (MIRA 14:9)  
(Vibrators)

VASYUTINSKIY, S.B., kand.tekhn.nauk, dotsent; NAGAYENKO, G.I., inzh.

Determination of the impedance of inductively coupled single-layer windings operating in a wide frequency range. Elektrichestvo no.12:49-52 D '65. (MIRA 18:12)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

*Vasyutinskiy, S.V.*  
VASYUTINSKIY, S.V., kand. tekhn. nauk; NAGAYENKO, G.P., inzh.

Heat calculations for current-conducting tubing. Vest. elektroprom.  
28 no.10:44-47 0 '57. (MIRA 10:12)

1. Leningradskiy politekhnicheskii institut.  
(Electric conductors)