YES'KINA, L.M.; SKAKAL'SKAYA, A.P.

Metric invariants of surfaces in quasi-elliptic spaces. Dokl. AN Azerb.SSR 18 no.1:7-10 '62. (MIRA 15:3)

1. Kolomenskiy pedagogicheskiy institut. Predstavleno akademikom AN AzSSR Z.I.Khalilovym.
(Spaces, Generalized) (Surfaces)

LYUSTGARTEN, Ye. I.; LI, V. P.; PASHKOV, A. B.; SKAKAL'SKAYA, N. B.; DAVYDOVA, T. I.; ZHUKOV, M. A.

Synthesis and analysis of copolymers with a macroporous structure. Plast. massy no. 5:7-10 '64. (MIRA 17:5)

L 33248-65 EWT(m)/EPF(c)/EWG(m)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 RPL RM/RWH/WW

ACCESSION NR: AP4035098 S/0191/64/000/005/0007/0010

AUTHOR: Lyustgarten, Ye.I.; Li, V.P.; Pashkov, A.B.; Skakal'skaya, N.B.; Davydova, T.I.; Zhukov, M.A. 43 41 13

TITLE: Synthesis and investigation of copolymers of microporous structure

SOURCE: Plasticheskiye massy, no. 5, 1964, 7-10

TOPIC TAGS: styrene divinylbenzene copolymer, acenaphthylene divinylbenzene copolymer, synthesis, macroporous structure, macroporosity, microporosity, thermal stability, radiation stability, bulk density, chain transfer, chain termination, polymerization, copolymer swelling, cross linkage, ion exchange resin

ABSTRACT: The synthesis and properties of macroporous copolymers of styrene with divinylbenzene (DVB) and of acenaphthylene with DVB which are useful as ion exchange resins, were investigated in solvents in which they swell (toluene, carbon tetrachloride) and in which they do not swell (n-heptane, n-nonane). The structures of the copolymers with improved mechanical and kinetic properties were also examined. Of these two types of copolymers, the acenaphthylene-DVB ion exchange resin probably has a higher thermal and radiation stability. The copolymers made in toluene and CCl_4 were similar in appearance and bulk density to the usual copolymers, but

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L 33248-65

ACCESSION NR: AP4035098

2

those synthesized in the aliphatic solvents formed dull granules of lower bulk density, characteristic of macroporous products. Thus, to obtain macroporous structure the solvent should mix with the initial monomer, should not cause chain transfer or termination, and not promote a swelling of the copolymer. The effect of the amount of solvent and of the extent of cross-linkage (DVB content) on the type of porosity was also examined. It was found that the macro- and average-size pores absorb cyclohexane, while all types of pores absorb toluene. The difference in absorption, therefore, determines the microporosity of the copolymers. The results indicated that increases in DVB and in solvent increase the total porosity of the copolymer and the macroporosity simultaneously with decrease in microporosity. The degree of macroporosity depends on the DVB to solvent ratio. For styrene copolymers the optimum ratio is 20-30 wt.% DVB and 50-60% (on weight of monomer) of n-heptane; for acenaphthylene copolymers 30-40% DVB and 40-50% n-nonane. "Work was conducted at the Ural State University under the direction of Prof. A.A. Tager." Orig. art. has: 1 table, 6 figures, and 5 equations.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 003 OTHER: 013

Card 2/2

SKAKAL'SKIY, B.G.

Hydrogeological and hydrochemical features of runoff from ravines in an excess-moisture zone. Trudy GGI no.102:227-253 '63. (MIRA 16:8)

(Runoff)

SKAKAL'SKIY, B.G.

Characteristics of the formation of the chemical composition of the waters of local runoff in the Shelon' River watershed. Trudy GGI no.119:67-87 '65. (MIRA 18:9)

ACC NR: AP7002013 SOURCE CODE: UR/0043/66/000/0 [illegible]/0103/0107

AUTHOR: Skakauskas, V. I.

ORG: none

TITLE: Certain exact solutions of kinetic equations

SOURCE: Leningrad. Universitet. Vestnik. Seriya matematiki, mekhaniki i astronomii, no. 4, 1966, 103-107

TOPIC TAGS: gas kinetics, kinetic equation, degree of freedom, chemical reaction, integral operator, differential operator

ABSTRACT: Certain exact solutions are presented which reduce to zero the integral and differential operators of the kinetic equations for gas mixtures filling all space, and existing in a steady conservative external force field. Two cases are considered: 1) gas mixtures without internal degrees of freedom; 2) gas mixtures with internal degrees of freedom and in the presence of chemical reactions. It is shown that the class of solutions for a mixture with internal degrees of freedom is smaller than that for a mixture without internal degrees of freedom. Orig. art. has: 11 formulas.

SUB CODE: 20/2/SUBM DATE: 16May65/ ORIG REF: 006/ OTH REF: 003/

Card 1/1 UDC: 533.70

SKAKODUBOV, A.

Pneumatic transportation of waste has been introduced. Muk.-elev. prom. 26 no. 12:26 D '60. (MIRA 13:12)

1. Krupchatnik mel'nitsy Sukhinichskoy realizationnoy bazy khleboproduktov Kaluzhskoy oblasti.
(Pneumatic-tube transportation)

ZAJDEL, Maria; SKAKONIK, Wilhelmina; FRYZE, Cezary

Studies on the blood balance in patients with apoplexy and non-traumatic subarachnoid hemorrhage. Preliminary communication. Neurologia etc. polska 11 no.1:53-56 Ja-F '61.

1. Z Kliniki Chorob Nerwowych PAM w Szczecinie Kierownik: doc. dr med. M. Jarema.

(SUBARACHNOID HEMORRHAGE blood)
(CEREBRAL HEMORRHAGE blood)

SKAKONIK, Wilhelmina; EISNER, Marek

Trials in the treatment of multiple sclerosis with diabetol associated with diets poor in carbohydrates. Roczn. pom. akad. med. Swierczewski 9:267-270 '63.

1. Z Kliniki Chorob Nerwowych Pomorskiej Akademii Medycznej Kierownik: prof. dr med. Michal Jarema i z III Kliniki Chorob Wewnetrznych Pomorskiej Akademii Medycznej Kierownik: doc. dr med. Marek Eisner.
(DIET THERAPY) (DIETARY CARBOHYDRATES)
(MULTIPLE SCLEROSIS) (CARBUTAMIDE)

SKAKOV, A. I. c/1957 DECEASED 1964

Railroads

SKAKOV, G.I., inzh.

Economic use of short rails. Put' i put.khoz. 4 no.10:37 O '60. (MIRA 13:9)
(Railroads--Rails)

SKAKOV G.I., inzh.

Switches made from Bessemer steel. Put' i put.khoz. 5 no.5:5-6 My '61. (MIRA 14:6)

(Railroads--Switches)

Card Tech Sci

SKAKOV, Yu. A., Engineer

Dissertation: "Investigation of the Structure of Iron-Nickel-Aluminum Alloys for Permanent Magnets."

21/12/50

Moscow Inst of Steel imeni I. V. Stalin

SO Vecheryaya Moskva
Sum 71

SKAKOV, Yu.

USSR/Metals - Metallurgy 1 Jul 51

"Structure of Iron-Nickel-Aluminum Alloys for Permament Magnets," Yu. Skakov, Moscow Inst. of Steel imeni Stalin

"Dok Ak Nauk SSSR" Vol LXXIX, No 1, pp 77-90

Skakov concludes that the high coercive resistance of Fe-Ni-Al alloys consists in formation of isolated dispersive ppn of ferrous phases inside the weakly magnetic Ni-Al matrix. The origin of the high coercive force should be sought in anisotropy of Fe particles and the texture of tensions inside these particles. Presented by Acad N.T. Gudtsov 9 May 51.

210T73

SKAKOV, Yu.A., kandidat tekhnicheskikh nauk.

The structure of iron-nickel-aluminum alloys with a high degree of coercive force. Sbor.Inst.stali no.31:79-120 '53. (MLRA 9:9)

1.Kafedra metallovedeniya i termicheskoy obrabotki.
(Iron-nickel-aluminum alloys--Metallography)

USSR/Physical Chem. Crystals B-5

Abs Jour : Referat Zhur - Khimiya, No 7, 1957, 22097

Author : Yu. A. Skakov
Inst : Not Given
Title : Determining of the crystallographic orientation of grains by electron microscopic examinations.

Orig Pub : Zavod. laboratoriya, 1956, 22, No 7, 806-809

Abstract : Two methods of determining the crystallographic orientation of grains in fine crystalline samples are offered by examination of electronic-microscopic photographs of etching figures in cases when cube-facets are bared after etching and the ribs of the etching figures have indexes (100), (010) and (001) 1) The analytical method is based on measuring the angles between the projections of the etching figures ribs on the photos. 2) The graphical methods utilizes a set of stereographic projections for different crystallographic directions. A projection conforming to the orthogonal projection of the ribs on the photo is found by way of superimposition.

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PANCHENKO, Yelena Vasil'yevna; SKAKOV, Yuriy Aleksandrovich; POPOV, Konstantin Viktorovich; KRIMER, Boris Isaakovich; ARSENT'YEV, Petr Pavlovich; KHORIN, Yakov Davidovich; LIVSHITS, B.G., doktor tekhn.nauk, prof., red.; GORDON, L.M., red.izdatel'stva; KARASEV, A.I., tekhn.red.

[Metallographic laboratory] Laboratoriia metallografii. Pod red. B.G.Livshitsa. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 695 p. (MIRA 10:12)
(Metallography)

SKAKOV, Yu. A.

AUTHORS: Varli, K.V., Michurina, K.A., Skakov Yu.A. 32-12-21/71

TITLE: A Method of Investigating the Electron Emission of Steel (Metodika elektronno-emissionnogo issledovaniya stali).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 12, pp. 1443-1446 (USSR)

ABSTRACT: In the introduction it is said that, although a model of the electron emission microscope for industrial use (in the USSR) has already been worked out, there is still a lack of scientific publications dealing with this problem. Reference is made to the work by K.Heidenreisch (Journ.of Appl.Phys. 26, 1955), which contains suitable information for the activation-working of carboniferous types of steel. In this paper a new method of emission-microscopic investigation of the re-crystallization ferrosilicon (iron silicide) and also a method how to study the $\alpha \rightleftarrows \gamma$-transformation of electrolytic iron is suggested. Besides, the results obtained by studying the process of nickel formation in the steel 10X05 are given. Research work was carried out by means of the microscope "ЭЭМ-75". The samples were ground and electrolytically polished. Because of the activation of the surface of the samples the following solution (according to Heidenreisch) was used: 11 mg formate of barium, 75 ml formic acid, and 25 ml isopropyl alcohol. In order to be able to expose the samples

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to a temperature of 1200-1300° during the research work, a special objective-holder is used, in which the sample in the emission microscope is under a vacuum 10^{-4} mm torr. For the purpose of comparison simultaneous recordings were made with light microscopes. In the chapter: Research results it is said that investigation of emission must be carried out at temperatures above 850°. In the case of ferrosilicon it was possible, during heating, to follow the process of recrystallization and of the dissolution of the ferrosilicon grain. In electrolytically pure iron the $\alpha \rightleftarrows \gamma$ -transformation could be observed as well as the structure of the ferrite at a temperature of 850-900° (photos are shown). In 10X05-steel it was possible to study the austenite structure. Observation made at higher temperatures diminished the contrasts of contours; at low temperatures research work is in need of working out suitable activation methods, in the course of which - as is presumed here - the application of formate of cobalt is said to be necessary. The micropictures were taken at $d < 1000$ Å. There are 4 figures, and 3 references, 2 of which are Slavic.

A Method of Investigating the Electron Emission of Steel 32-12-21/71

ASSOCIATION: Moscow Institute for Steel imeni Stalin (Moskovskiy Institut stali im. Stalina)

AVAILABLE: Library of Congress

Card 3/3 1. Steel-Electron emission 2. Emission-Microscope applications

Skakov, Yu. A.

20-2-21/60

AUTHORS: Skakov, Yu. A. , Chernikova, I. N. , Sharshatkina, A. V.

TITLE: On Structure and Composition of Carbide in Low-Drawn Steel (O strukture i sostave karbida nizkootpushchennoy stali)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 294 - 295 (USSR)

ABSTRACT: First there is a short reference on previous studies, dealing with the same subject. The authors examined by electronographical ways, the drawing of carbonaceous steel of the following composition (in %): 0,58 % C, 0,10 % Mn, 0,08 % Si, 0,033 % S, 0,005 % P and 0,017 % N. The samples were chilled in water and drawn at the temperatures of 100, 200 and 400°C. After careful metallographical preparations of the test-pieces and with application of a deep-going electrolytic pickling (in aqueous solution of KCl with addition of citric acid), the electronograms were taken "on reflection". In the case of the test-pieces, which were drawn at 100°C, satisfactory electronograms could not be obtained. The results, which were obtained after drawing at 200° and 400° are illustrated in two diagrams and in one table. The carbide of the low-drawn

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On Structure and Composition of Carbide in Low-Drawn Steel

steel has a hexagonal lattice with a tight packing of the atoms of iron; the lattice unit has the dimension a = 2,73 Å and c = 4,34 Å. In case of drawing at 200° probably a small quantity of cementite results. After drawing at 400° there practically is no more hexagonal carbide. In the electronogram of hexagonal carbide the reflections with the indices (001) and (hkl) with h + k = 3n, if l ≠ 2n, i.e. the structure of carbide is exactly one of the structures of the ε-phase of the system iron-nitrogen, are missing. The non-metallic atoms statistically are orientated equally in the octahedral pores of the hexagonal compact lattice, which is formed by the iron atoms. Such a structure can form in a large range of concentration and the formula Me_2X is valid for the limits of the percentage of the non-metallic component. Further the authors geometrically computed the carbon content in the carbide of low-drawn steel and they found for "ε - carbide" a carbon content of about 16 atom per cent. The calculation, based upon the change of the period a, gives a percentage of 18 % C. Therefore can be assumed that the composition of the "ε - carbide" nearly is described by the formula Fe_4C. There are 2 figures, 1 table, and 7 references,

On Structure and Composition of Carbide in Low-Drawn Steel 20-2-21/60

5 of which are Slavic.

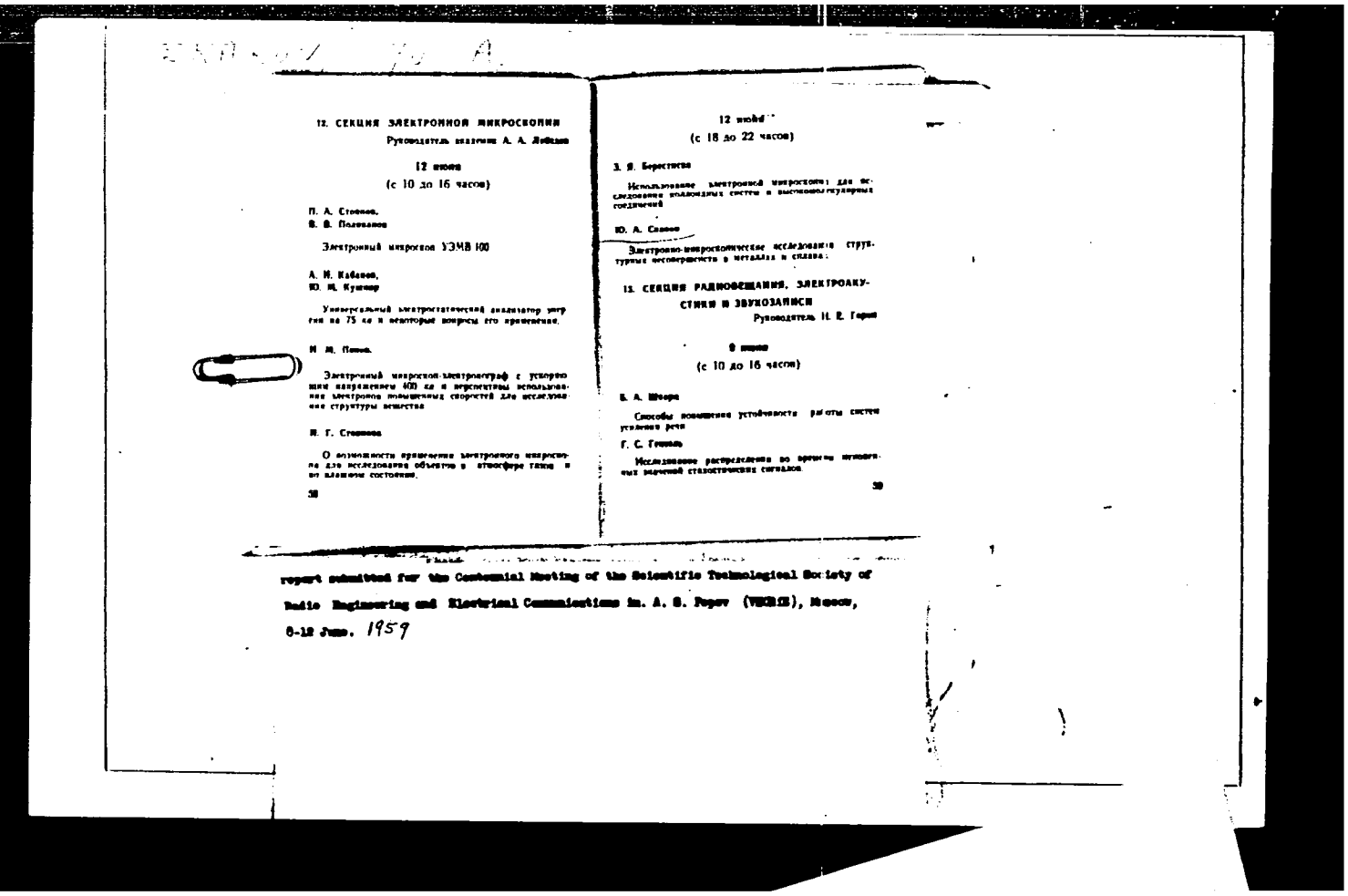
ASSOCIATION: Institute for Steel imeni I. V. Stalin, Moscow (Moskovskiy institut stali im. I. V. Stalina)

PRESENTED: July 19, 1957, by G. V. Kurdyumov, Academician

SUBMITTED: July 5, 1957

AVAILABLE: Library of Congress

Card 3/3



12. СЕКЦИЯ ЭЛЕКТРОННОЙ МИКРОСКОПИИ

Руководитель академик А. А. Лебедев

12 июня

(с 10 до 16 часов)

П. А. Стенин,
В. В. Поливанов

Электронный микроскоп УЭМВ-100

А. И. Кабанов,
Ю. М. Кушнир

Универсальный электростатический анализатор энергии на 75 кв и некоторые вопросы его применения.

И. М. Панин.

Электронный микроскоп-электронограф с ускоряющим напряжением 400 кв и перспективы использования электронов повышенных скоростей для исследования структуры вещества

И. Г. Стешенко

О возможности применения электронного микроскопа для исследования объектов в атмосфере газов и во влажном состоянии.

58

12 июня

(с 18 до 22 часов)

З. Я. Берестова

Использование электронной микроскопии для исследования коллоидных систем и высокомолекулярных соединений

Ю. А. Скаков

Электронно-микроскопические исследования структурных несовершенств в металлах и сплавах.

13. СЕКЦИЯ РАДИОВЕЩАНИЯ, ЭЛЕКТРОАКУСТИКИ И ЗВУКОЗАПИСИ

Руководитель И. Е. Горон

9 июня

(с 10 до 16 часов)

Б. А. Шварц

Способы повышения устойчивости работы систем управления речи

Г. С. Гешель

Исследование распределения по времени мгновенных значений стационарных случайных сигналов

59

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNIIRE), Moscow, 8-12 June. 1959

Cold-shortness of Commercial Iron

SOV/163-59-2-45/48

There are 5 figures, 1 table, and 8 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: May 28, 1958

Card 2/2

SKAKOV, Yu.A.

Changes in the microstructure of beryllium bronze under the effect of aging. Izv.vys.ucheb.zav.; tsvet.met. 2 no.4: 125-130 '59. (MIRA 13:1)

1. Moskovskiy institut stali. Kafedra rentgenografii i fiziki metallov.
(Copper-beryllium-nickel alloys--Metallography)

SOV/126-7-1-20/28

AUTHORS: Maslenkov, S.B., Skakov, Yu.A. and Ya.S. Umanskiy

TITLE: Structural Changes in Aluminium Bronze Under the Action of Cold Plastic Deformation and Annealing (Strukturnyye izmeneniya v alyuminiyevoy bronze pod deystviyem kholodnoy plasticheskoy deformatsii i otzhiga)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 1, pp 137-141 (USSR)

ABSTRACT: The structural changes after deformation and annealing of monophase aluminium bronze containing 8.02 wt % (17.1 at %) Al (alloy 1) have been investigated electron-optically and by X-rays. In order to solve auxiliary problems of the investigation an alloy known to be two-phased, containing 12 wt % (25.0 at %) Al (alloy 2), was cast. The ingots were hot forged and were given a homogenizing anneal (900°C, 10 hrs). After annealing alloy 1 at 600°, it was found that $a = 3.645_1$ = kX; this result, as well as that for the lattice parameter of the α-phase in alloy 2 (a = 3.652) agrees well with data on the relationship a = f (at % Al) (Ref.6). Thus alloy 1 is in the monophase α-region of

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Structural Changes in Aluminium Bronze Under the Action of Cold Plastic Deformation and Annealing

the existing constitutional diagram. According to electronographic data (Fig.1a and Table on p 140) the lattice parameter of the face-centred cubic solid solution of a specimen of alloy 1, annealed at 600°C, is 3.75 kX. An electron microscope analysis has shown that in this specimen there are, in the vicinity of the grain boundaries, regions rising above the surface of the micro-section, having a width of 0.3 to 0.4 microns, which are difficult to etch (Fig.2a). These regions represent a solid solution (α') with an increased concentration of aluminium and possible other impurities. Comparing this result with the known relationship a = f (at % Al), it can be assumed that the concentration of aluminium in the grain boundary regions of the solid solution is close to the composition of the γ-phase. Deformed specimens give different diffraction pictures, according to the etchant used. After etching in aqua regia, a system of lines of the α solid solution can be seen in the X-ray picture, having a sharply defined texture (Fig.1b). Etching in a mixture of alkalis

Structural Changes in Aluminium Bronze Under the Action of Cold Plastic Deformation and Annealing

leads to the appearance of a system of diffuse lines, instead of textured ones, in the X-ray photograph (Fig.1c). The interplanar distances are close to those given for the γ-phase (see Table). The electronographic data on the appearance of the γ-phase as a result of cold deformation are in agreement with the photomicrograph shown in Fig.2b. On the basis of microhardness tests after 30 minute annealing at various temperatures (Fig.3a), the authors have chosen for their further investigations a temperature range of 275-300°C for annealing. Annealing at these temperatures leads to a pronounced ordering effect. Microhardness measurements after various annealing times at 275°C (Fig.3b) have shown that the hardness of the alloy is not fully removed after very lengthy soaking (up to 100 hrs). Structural changes on annealing consist, firstly, in an increased structural non-uniformity, and in an increase in the volume of the γ-phase. This is evident from the microstructure. In Fig.2c new slip lines are visible. These are regions in which the γ-phase, or the solid solution of increased aluminium concentration, has separated out.

Structural Changes in Aluminium Bronze Under the Action of Cold Plastic Deformation and Annealing

Secondly, a basic change in the fine crystalline structure of the solid solution occurs. The lattice parameters of the α-solution in specimens which have been aged for up to 100 hours at 275°C, as well as for 5 hours at 325 - 350°C, differ negligibly from the lattice parameter of an undeformed specimen. There are 3 figures, 1 table and 6 references, of which 5 are Soviet and 1 English.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: April 1, 1957

7(6), 9(0), 18(7) SOV/32-25-1-26/51

AUTHORS: Skakov, Yu. A., Arengol'd, M. B., Sharshatkina, A. V.

TITLE: Electron Microscopic and Electronographic Investigation of the Transparency of Foils (Metal Laminas) (Elektronno-mikroskopicheskoye i elektronograficheskoye issledovaniye na prosvet plenok)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 1, pp 64 - 65 (USSR)

ABSTRACT: A method is described for the electrolytic dilution of samples from composed alloys (of the K40NKhM and Gatfil'd steel). The strips (20 x 40 mm) of the alloy under investigation were diluted by electrolysis to approximately 0.1 mm thickness. For the two alloys mentioned above an electrolyte consisting of 195 cm^3 H_3PO_4 + 30 g CrO_3 was employed at a current density of about 0.2 ampere/cm^2. The electronographic investigation of the luminal transparency can be carried out by the EM-4 electronograph. The method described provides an explanation of the structural changes at a low temperature deformation and hardening of the K40NKhM alloy. A second

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group of lines was observed ($\frac{d}{n}$ = 2.15 and 1.95 Å), that apparently corresponds to that alloy portion having a higher molybdenum and carbon content. After hardening at 700°, the presence of a carbide phase of the type $Co_3Mo_3[(Co,Fe,Cr)_3(Mo,Cr)_3C$ with cubic lattice, a=11,0 Å] was ascertained. The method described is recommended for the investigation of the chemical heterogeneity and the structural disturbances of the alloy basis.

ASSOCIATION: Moskovskiy institut stali im. I. V. Stalina (Moscow Steel Institute imeni I. V. Stalin)

18 (7)
AUTHORS: Paisov, A. I., Skakov, Yu. A. SOV/32-25-6-23/53

TITLE: Investigation of Metal Foils Obtained by Tapering With the Irradiation Electron Microscope (Issledovaniye metallicheskikh plenok, poluchennykh uton'sheniyem, v prosvechivayushchem elektronnom mikroskope). Survey (Obzor)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 6, pp 710-714 (USSR)

ABSTRACT: A survey is given here of methods (introduced abroad) concerning the electron microscopic investigation, and making use of the direct irradiation of metal foils (without replicas). Tapering of the metal samples by rolling and forging to a thickness of 0.2-0.02 mm is mentioned as the first operation for the preparation of metal foils. Further tapering of the foil is mostly brought about by electrolytic polishing, with different electrolytes being used. A few technical data taken from publications are given as well as electron microscopic figures of various metal structures, showing inter alia (Fig 6) dislocation displacements under the effect of the electron beam. The electron microscopic and electron diffraction investigations of thin metal foils reveal that

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the formation of a cell structure in the electrolytic polishing and in the chemical pickling operations is dependent on electrode processes. Investigations of the kind mentioned allow a thorough study of the metal aging processes. There are 6 figures and 26 references, 1 of which is Soviet.

GORELIK, S.S.; ROZENFEL'D, A.M.; SKAKOV, Yu.A.; SPIRIDONOV, V.B.

Investigating the nichrome recrystallization process following small deformations with use of the EMM-75 emission microscope. Izv. vys. ucheb. zav.; chern. met. no.1:159-166 '60. (MIRA 13:1)

1.Moskovskiy institut stali i nauchno-issledovatel'skiy institut, pochtovyy yashchik No.4064.
(Nichrome--Metallography)

SKAKOV, Yu.A.

Distribution of dislocations in commercial iron. Izv.vys.ucheb. zav.; chern.met. no.3:65-72 '60. (MIRA 13:4)

1. Moskovskiy institut stali.
(Dislocations in metals) (Iron--Metallography)

SKAKOV, Yu.A.

Observations of the dislocation structure of commercial-grade iron grain and block boundaries. Izv.vys.ucheb.zav.; chern. met. no.5:85-90 '60. (MIRA 13:6)

1. Moskovskiy institut stali.
(Iron--Metallurgraphy) (Dislocations in metals)

GORELIK, S.S.; ROZENFEL'D, A.M.; SKAKOV, Yu.A.; SPIRIDONOV, V.B.

Mechanism of the formation and disappearance of twins during the heating of deformed nickel-chromium alloys. Izv. vys. ucheb. zav.; chern. met. no.2:105-111 '60. (MIRA 15:5)

1. Moskovskiy institut stali.
(Nickel-chromium alloys--Metallography)
(Crystal lattices)

80597

S/148/60/000/005/007/009

18.1230

AUTHORS: Skakov, Yu.A., Umanskiy, Ya.S.

TITLE: Investigation Into Changes of Fine Intergranular Structure of a Composite Cobalt-Base Alloy K40HKM (K40NKhM) in Plastic Deformation and Annealing

PERIODICAL: Izvestiya vyssikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, Nr 5, pp 150 - 158

TEXT: The K40NKhM alloy [Refs 1, 2] is strengthened in a high degree during plastic deformation and is, moreover, subjected to considerable additional strengthening by low temperature annealing. The authors investigated the character of structural changes corresponding to strengthening and softening. The composition of the alloy is given: 0.08% C; 36.4% Co; 20.1% Cr; 15.25% Ni; 7.05% Mo; 16.3% Fe; 0.40% Si; 1.82% Mn. The alloy specimens were subjected to cold rolling (10, 30, 50 and 70% compression) after water quenching from 1,150°C. Tempering was carried out at 100° to 900°C for four hours. At 500°C the tempering time was changed from 2 to 100 hours and at 700°C up to 18 hours. Microhardness of all specimens was measured. The experimental work

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80597

S/148/60/000/005/007/009

Investigation Into Changes of Fine Intergranular Structure of a Composite Cobalt-Base Alloy K40HXM (K40NKhM) in Plastic Deformation and Annealing

was performed with the participation of A.V. Sharshatkina and students of MIS, L.K. Kostin and M.M. Arengol'd, D.I. Gabrielyan and other collaborators of IPS TsNIIChM, in particular V.A. Sol'ts, assisted in the selection and preparation of the test items. Results of experiments are described in detail and the following conclusions are drawn: Strengthening of the alloy by cold plastic deformation and additional strengthening by heating up to 500°C depend on the same factors, i.e. crushing of mosaic domains (down $\sim 10^{-6}$ cm) and large microdeformations of the crystalline lattice of the solid solution (up to $\sim 4.10^{-3}$). However, the significance of these strengthening factors is different in deformation and strengthening tempering. If the degree of compression increases from 50 to 70%, strengthening depends on further crushing of domains; additional strengthening in low tempering of a strongly deformed alloy depends mainly on changes in the character of distribution of microdeformations and their growth. Microdeformations of the crystalline lattice are mainly caused by the fine concentrational heterogeneity in the solid solution. Differentiation of components (first of all molybdenum and carbon) takes place in the zones with dimensions of the order of 10^{-6} cm. A

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80597

S/148/60/000/005/007/009

Investigation Into Changes of Fine Intergranular Structure of a Composite Cobalt-Base Alloy K40HXM (K40NKhM) in Plastic Deformation and Annealing

higher degree of compression, an extended time or higher temperatures of tempering, entail enlarged localization zones of microdeformations in the crystalline lattice of the solid solution; (or enlargement of solid solution zones with higher concentration of Mo and C). Such a structure precedes the separation of the carbide phase and corresponds to maximum hardness. The separation of the carbide phase is accompanied by the elimination of microdeformations of the crystalline lattice and by the sharp enlargement of mosaic structure domains, which causes softening.
There are: 5 sets of graphs, 1 set of microphotos and 6 references, 4 of which are Soviet, 1 French and 1 English.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: April 1, 1959

Card 3/3

S/129/61/000/001/003/013
E111/E135

AUTHOR: Skakov, Yu.A., Candidate of Technical Sciences

TITLE: Change in Structure of Technical Iron During Ageing

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No. 1, pp. 15-19

TEXT: The author gives results of an investigation of ageing structural changes in laboratory and production heats of technical iron containing 0.01-0.1% C and 0.005-0.045% N and some other alloys, Table 1 (heats 1-7 were laboratory heats, heat 8 - open hearth steel, heats 9 and 10 - Bessemer steel; "следы" - traces). In the investigation of ageing after hardening the hardness was measured. Fig.1 shows hardness for heats (curve numbers indicate heat numbers as given in Table 1) as a function of ageing time at 100 °C; the top curves were obtained with a ПМТ-3 (PMT-3) instrument, the bottom ones with a Vickers instrument. Except for the heat with C + N < 0.01% (heat 1) the curves are complicated, having two maxima. Electron-microscopic examinations were also carried out. This revealed the presence of etching-spots (spheroids about 100 Å diameter), on specimens of heat 1.

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S/129/61/000/001/003/013
E111/E135

Change in Structure of Technical Iron During Ageing

Таблица 1

Условный № плавки	C	S	P	N	Mn	Si	O
1*	0,009	0,048	0,011	0,0065	—	—	—
2*	0,009	0,042	0,013	0,016	0,10	0,05	0,02
3*	0,009	0,028	0,015	0,043	0,09	Следы	—
4*	0,07	—	0,076	0,013	—	—	0,015
5*	0,05	—	0,096	0,036	—	—	0,017
6*	0,03	—	0,031	0,045	0,05	—	0,060
7*	0,021	0,019	Следы	0,005	Следы	0,04	—
8**	0,02	0,02	0,03	0,005	0,17	0,16	—
9***	0,08	0,016	0,016	0,026	0,28	0,02	—
10***	0,032	0,032	0,05	0,012	0,18	—	—

Table 1

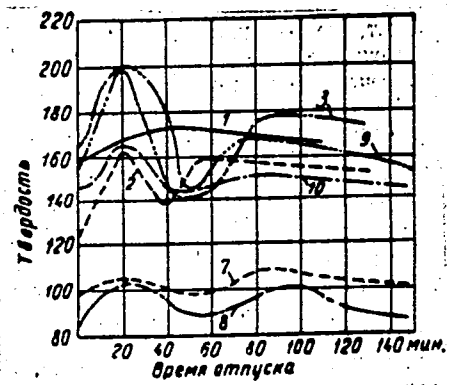

Fig.1

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E111/E135

Change in Structure of Technical Iron During Ageing .

The author discusses this effect and the hardness curves in terms of dislocations. A photo of the microstructure of Bessemer steel aged for 10 hours at 200 °C is reproduced; this contains plate-like segregations but no etch spots. The dislocation approach explains the first hardness maxima (and the simple curve for heat 1); the second is attributable either to increasing carbon or nitrogen content. Microstructure changes associated with formation of segregations in ageing at 100 °C were observed on two heats. The microstructure for heat 3 (0.009% C, 0.28 S, 0.015 P, 0.043 N, 0.09 Mn, traces Si) obtained with 20 min ageing is reproduced. A characteristic feature of this is a 0.1 u wide zone adjoining the boundaries which is free from etch spots. With longer ageing numerous plates appear. Similar changes occur with Bessemer steel. The author suggests that in low-temperature ageing one phase of complex composition is first formed perhaps with a metastable structure; this is supported by electron-diffraction work of the author jointly with S.K. Maksimov and A.V. Sharshatkina. Ageing changes were also studied by measuring X-ray diffraction line (220)

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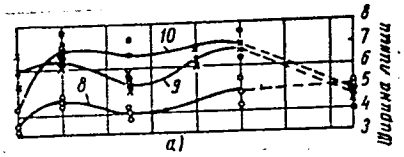
S/129/61/000/001/003/013
E111/E135

Change in Structure of Technical Iron During Ageing

widths (measured with the aid of a type УРС-50И (URS-50I) installation, iron radiation). Fig.4 shows line width (left-hand graph) and intensity as functions of ageing time (minutes) at 100 °C for heats 8, 9 and 10.



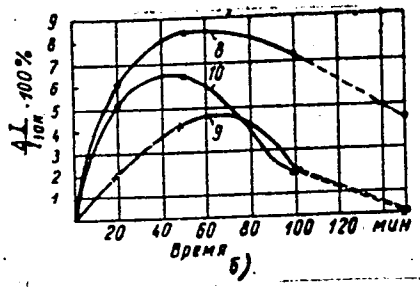


Fig. 4

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S/129/61/000/001/003/013
E111/E135

Change in Structure of Technical Iron During Ageing

Data on block dimensions and disorientation are shown in Table 2.

Heat No.	Treatment	Block dimension μ	Disorientation angles of the blocks	Dislocation density (per cm^2)
1	Quenching Annealing Ageing (200 °C, 10 hrs)	1-5 2-10 (2-10)*	2° - 20' 15° - 6' 20° - 10'	10^9 10^9 10^9
5	Strain ageing (250 °C, 2 hrs)	0.5-3	1° (within the grain up to 8°)	10^{10}

* Blocks not defined clearly (contours not fully closed)

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S/129/61/000/001/003/013
E111/E135

Change in Structure of Technical Iron During Ageing

The microstructures obtained in laboratory heats of technical iron and Bessemer steel after cooling from rolling temperature, deformation by extension (10%) and ageing (250 °C, 2 hours); after hot rolling iron with 0.035% N initially, plates of nitride phase appear (Fig.5, left-hand); after cold deformation the density of etch spots rises (middle); after ageing contract of the spot structure increases and closed chains of points are formed (right-hand). Similar changes but without closed-chain formation are found with Bessemer steel. The author considers that the results confirm the views of A.H. Cottrell on the mechanism of deformation ageing of technical iron.
Note: This work was reported at the 2nd All-Union Conference on Electron Microscopy, May 1958. A.V. Sharshatkina, M.F. Zaytsev and I.N. Levashova participated.
There are 5 figures, 2 tables and 5 references: 4 Soviet and 1 German.

Card 6/7 Moscow Steel Inst.

BERNSHTEYN, M.L., red.; SKAKOV, Yu.A., red.; LEVIT, Ye.I., red. izd-va; ISLENT'YEVA, P.G., tekhn. red.

[New electron microscopic studies] Novye elektronnomikroskopicheskie issledovaniia. Moskva, Metallurgizdat, 1961. 214 p. Translated from the English. (MIRA 16:5)
(Electron microscopy) (Metallography)

SPIVAK, G.V.; VERTSNER, V.N.; LUK'YANOVICH, V.M.; LEVIN, Ye.Ye.; SKAKOV, Yu.A.

Third All-Union Conference on Electron Microscopy. Radiotekh. i elektron. 6 no.5:852-862 My '61. (MIRA 14:4)
(Electron microscopy—Congresses)

S/032/61/027/002/017/026
B134/B206

AUTHORS: D'yakonov, L. I. and Skakov, Yu. A.

TITLE: Camera for taking aimed radiographs

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 2, 1961, 205-206

TEXT: Microfocusing X-ray tubes can be used for the X-ray analysis of single microstructure elements. An X-ray camera is described which permits to produce sufficiently sharp beams by means of a customary X-ray tube, and to focus them onto the place to be examined of an order of magnitude of 100μ. The pictures can be taken without combination of the device with the optical system described by A. Kh. Geysler (Ref. 1). A cone system is used which is installed on the camera and the optical microscope. The camera is specially suitable for determining the orientation of single crystal grains. The camera consists of two collapsible parts (Fig.). The distance between sample and film is controlled by pulling out the left part A from part B. The latter is mounted directly on the YPC-55 (URS-55) instrument, or on the YPC-70

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Camera for taking aimed radiographs

S/032/61/027/002/017/026
B134/B206

(URS-70) instrument, by means of a special holder. The sharpness of the beam is adjusted by means of two identical cones fixed on the camera (3) and on the stage, by shoving in the inner cone (5) with the sample holder (6). The sample (7) can be displaced vertically to the beam axis. When exactly focused, the axes of beam and the centering cone of the camera (3) coincide. After sharp focusing, the part of the microstructure to be examined is brought into the cross hairs of the eyepiece by means of the microscrews (8). (1) is the collimator, (2) the film, and (4) are screws for displacing the centering cone. Owing to the small distance between sample and film (maximum 5mm), the exposure time can be reduced to a few hours. Single granules of a polished section of transformer steel with an average size of 100μ were examined by means of the camera described. There are 1 figure and 1 Soviet-bloc reference.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

Card 2/2

S/129/62/000/011/001/007
E073/E535

AUTHORS: Skakov, Yu.A., Candidate of Technical Sciences and T'ien Shu-Sen, Engineer

TITLE: The mosaic structure of aluminium

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.11, 1962, 10-13

TEXT: The authors compared X-ray diffraction and electron microscope data on the internal structure of polycrystalline 99.9% aluminium specimens which were rolled at room temperature to a thickness of 0.17 mm and then annealed for one hour at 100, 200 and 350°C, respectively. For the electron microscope investigations, specimens thinned down to translucency by electrolytic etching as well as oxide replicas of etched polished surfaces were used. The X-ray investigations (on specimens annealed at 350°C) comprised estimation of the coherent scattering area and of the disorientation of the crystallite blocks. These investigations, as well as hardness measurements, confirmed that annealing at 350°C resulted in full recrystallization. Conclusions: The sub-structure of annealed aluminium is characterized by the

Card 1/2

MAKSIMOV, S.K.; SKAKOV, Yu.A.; ZHETVIN, N.P.; PAISOV, A.I.

Role of phase composition of precipitates in the magnetic aging of mild steel. Izv. vys. ucheb. zav.; chern. met. 5 no.3:122-124 '62. (MIRA 15:5)

1. Moskovskiy institut stali i zavod "Serp i molot".
(Steel--Hardening) (Case hardening)

S/126/62/013/001/014/018
E193/E383

18.1100

AUTHORS: Lozinskiy, M.G., Sokolkov, Yc.N., Varli, K.V. and Skakov, Yu.A.

TITLE: The effect of high-temperature thermomechanical treatment on the fine crystal structure of austenitic steels and alloys

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no. 1, 1962, 157 - 143

TEXT: In contrast to treatment which consists of plastic deformation of steel below the upper limit of the martensitic-transformation range (i.e. at 400 - 600 °C), followed by quenching and which, according to the present authors, should be referred to as "low-temperature thermomechanical treatment" (NTMO), the term "high-temperature thermomechanical treatment" (VTMO) is proposed for a similar treatment in which steel is deformed at a temperature above its recrystallization temperature before quenching. It has already been established that a substantial increase in the strength of steel can be brought about

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The effect of ....

by this treatment and it has been postulated that this effect is partly associated with changes in the fine crystal structure of the material, formation of stresses of the second type and texture. It was in order to check this postulate that the investigation described in the present paper was undertaken. Experiments were carried out on a Cr-Ni-Mn steel containing 0.36% C, 0.5% Si, 8.0% Mn, 12.2% Cr, 8.5% Ni, 1.5% V, 1.15% Mo, 0.3% Nb (alloy A) and on Nimonic type alloy containing 0.05% C, 0.5% Si, 0.3% Mn, 20.09% Cr, 0.6% Al and 2.4% Ti (alloy B). Test pieces (square rods measuring 11 x 11 x 60 mm) were heated in air in an electric furnace, hot-rolled, quenched and then aged, the various schedules employed being given in Table 1. In some cases, a higher rolling speed (5.7 m/min) or heavier reductions (56%) were used. At the same time, pilot test pieces were heat-treated in the conventional manner by quenching from temperatures given in column 4 of Table 1. The effect of each type of treatment was then studied by metallographic examination, measuring Vickers hardness and electrical resistivity at room temperature, determining the lattice parameters of the

The effect of ....

solid-solution matrix, block dimensions and the magnitude of microstresses, and by evaluation of the character of texture of the specimens. Some of the typical results are given in Table 2. Similar results were obtained for alloy B, which, however, requires supplementary study. The conclusions reached can be summarized as follows:

1) VTMO brings about substantial (in comparison with the conventional hardening treatment) changes in the shape of the grain boundaries and orientation of the grains, and markedly affects the condition of the solid-solution matrix.

2) VTMO promotes more complete dissolution of the second phase on heating and more complete precipitation of this phase during ageing than the conventional heat-treatment.

3) VTMO brings about a decrease in the dimensions of the mosaic blocks (down to 0.05 μ in the case of alloy A), this effect becoming less pronounced if higher temperatures or faster rolling speeds are employed.

4) Quite large (up to 1×10^{-3}) microstrains are set up in the alloy as a result of VTMO, ageing or quenching from relatively

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The effect of ....

high temperatures.
5) Materials subjected to VTMO have a texture close to axial, the [111] direction being the preferred orientation parallel to the direction of rolling.
6) A maximum increase in strength is attained after VTMO followed by ageing. The beneficial effect of this treatment is associated with the precipitation of a large quantity of the hardening-phase particles, with more favourable distribution of this precipitate and indirectly with the reduced size of the mosaic blocks. There are 2 tables.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals of the AS USSR)

SUBMITTED: September 18, 1961

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Table 1: Schedules of VTMO and subsequent heat-treatment of test pieces which were hot-rolled during VTMO to 25% reduction at a rolling speed of 1.5 m/min and then quenched in water.

Material	No. of treatment schedule	Temperature, °C and holding time, hrs	Rolling temperature, °C	Ageing conditions, °C
Alloy A	I	1150 - 1 hr	1100	750 - 4 hrs
	II	1175 - 1 hr	1000	750 - 4 hrs
	III	1200 - 1 hr	1200	750 - 4 hrs
Alloy B	I	1080 - 8 hrs	1080	700 -16 hrs
	II	1080 - 8 hrs	1000	700 - 16 hrs

The effect of ....

Table 2: Properties of Alloy A after VTMO carried out according to schedule I (as given in Table 1)

Type of Treatment	Lattice parameter, kX	resistivity, $\mu\Omega$-cm	Block dimensions D, μ	Micro-deformation, $\xi \cdot 10^4$	HV, kg/mm^2
Conventional hardening without ageing	3.595	62.7	≥ 0.2	0	220
Conventional hardening with ageing	3.592	61.2	$\frac{\geq 0.2}{\geq 0.2}$	$\frac{10}{8}$	290
VTMO (without ageing)	3.598	63.4	$\frac{0.06}{0.05}$	$\frac{4}{7}$	240
VTMO (with ageing)	3.590	59.4	$\frac{0.06}{0.05}$	$\frac{7}{10}$	330

$\geq$ in the numerator - results obtained by the approximation method; in the denominator - results of harmonic analysis.

Card 6/6

GORELIK, Semen Samuilovich; RASTORGUYEV, Leonid Nikolayevich; SKAKOV, Yuriy Aleksandrovich. Prinimali uchastiye: BELIKOV, A.T.; VISHNYAKOV, Ya.D.; LYUTSAU, V.G., red.; VLADIMIROV, Yu.V., red.izd-va; BEKKER, O.G., tekhn. red.

[X-ray and electron diffraction examination of metals; practical guide to X-ray analysis, electron diffraction examination and electron microscopy] Rentgenograficheskii i elektronograficheskii analiz metallov; prakticheskoe rukovodstvo po rentgenografii, elektronografii i elektronnoi mikroskopii. Moskva, Metallurgizdat, 1963. 256 p.
___[Supplement; calculation data tables and standard X-ray diffraction patterns] Prilozheniia; spravochno-raschetnye tablitsy i tipovye rentgenogrammy. 1963. 92 p.
(MIRA 17:1)

(Metallography) (Electron microscopy)
(Electron diffraction examination)

SKAKOV, Yu.A.; ASHMARIN, G.M.; KLEYNMIKHEL'-RIKHLING, U.

Kinetics of the initial stage in the quench-aging of commercial-grade iron. Izv. vys. ucheb. zav.; chern. met. 6 no.11:157-160 '63. (MIRA 17:3)

1. Moskovskiy institut stali i splavov.

S/126/63/015/002/020/033
E193/E383

AUTHORS: Skakov, Yu.A. and Mezhennyy, Yu.O.

TITLE: Stacking faults and segregation in Cobalt-base alloys

PERIODICAL: Fizika metallov i metallovedeniye, v. 15, no. 2, 1963, 280 - 284

TEXT: Two alloys of the К40НХМ (K40NKhM) type (approximately 40% Co, 20% Cr, 14% Fe, 16% Ni, 7% Mo) with a high (0.1%) and low (0.03%) carbon content were used as the experimental materials. The displacement of the peaks of the (111) and (200) lines, diffracted by a face-centered cubic lattice of the solid solution, was studied to determine the concentration of the stacking faults in filings produced at room temperature and then annealed at 400 - 700 °C. These experiments were supplemented by determining the position of the centre of gravity of the (111) line. Typical results obtained for the 0.1% C alloy are reproduced in Fig. 1, showing the profile of the (111) lines of specimens in the following condition: а) quenched; б) quenched and deformed (by filing); в, г, д) quenched, deformed and then

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S/126/63/015/002/020/033
E193/E383

Stacking faults ....

annealed at 400, 500 and 600 °C, respectively; P and G indicate, respectively, the position of the peak and the centre of gravity of the line. Conclusions: 1) plastic deformation of alloys of the K40NMhM type at room temperature brings about the formation of a large quantity (up to 7%) of stacking faults. The carbon content of the alloy has no significant effect on the probability of the formation of the stacking faults which is, however, increased in the presence of Mo and Cr. 2) The hardness of specimens deformed at room temperature increases after annealing at low (up to 500 °C) temperatures. This effect has been attributed to the segregation in the vicinity of the stacking faults; thus, for instance, in the case of an alloy with a nominal Mo content of 7%, the concentration of this element in the region of hexagonal stacking has sometimes been found to be 20%. 3) After high-temperature annealing accompanied by the precipitation of carbides, stacking faults disappear, the alloy becomes homogeneous and its hardness decreases. There are 2 figures and 1 table.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

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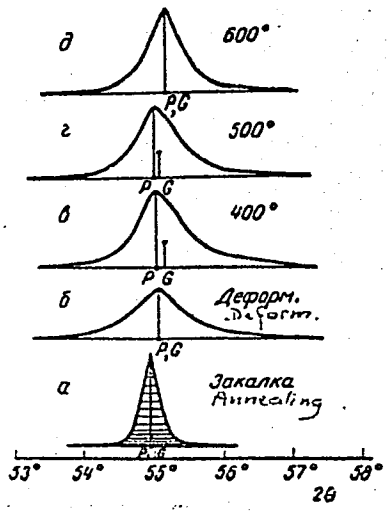
S/126/63/015/002/020/033
E193/E383

Stacking faults ....

Fig. 1:



Card 3/3

L 15563-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3004590 S/0126/63/016/001/0051/0056

AUTHORS: Skakov, Yu. A.; Kleynmikhel', U.

TITLE: Kinetics of the aging process of commercial iron and the nature of structural changes at various aging stages

SOURCE: Fizika metallov i metallovodeniye, v. 16, no. 1, 1963, 51-56

TOPIC TAGS: commercial iron, aging, structure change, aging stage

ABSTRACT: The influence exerted by the admixture content (C+N) and the quantity of defects on the kinetics of the primary and secondary hardening stages has been investigated. The aging of four iron samples of different compositions was studied at 100C after annealing, after natural aging, after hardening at temperatures 700-940C, and after the deformation (7.4% stretching). Because the solution still contained a considerable part of admixtures after the secondary hardening maximum, the variations of hardness in the result of a protracted aging were investigated. Finally, the compositions of phases separated in boiling open hearth and Bessemer steels (after hardening and aging during various time intervals at 100C) have been studied by electron diffraction analysis. Three maxima in the variation of a low carbon steel have been established. The kinetics of the first aging stage

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L 15563-63
ACCESSION NR: AP3004590

varied little with the degree of oversaturation in the solid solution, with the composition and mode of steel melting, and with the concentration of defects (vacancies and dislocations). The kinetics of the subsequent stages varied considerably with the above factors and, possibly, with the relation between the content of dissolved nitrogen and carbon. The electron diffraction pattern showed the separation of the α'' phase ($Fe_{16}N_2$) at the second stage. The third stage was the formation of the γ' -phase (Fe_4N). Orig. art. has: 1 table and 5 figures.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 27Nov62 DATE ACQ: 27Aug63 ENCL: 00

SUB CODE: ML NO REF SOV: 006 OTHER: 003

Card 2/2

SPIRIDONOV, V.B.; SKAKOV, Yu.A.; IORDANSKIY, V.N.

Use of the method of thin metallic foils for studying the morphology of martensite. Zav.lab. 29 no.8:955-956 '63. (MIRA 16:9)
(Martensite—Metallography) (Metal foils)

IORDANSKIY, V. N.; SKAKOV, Yu. A.; SPIRIDONOV, V. B.

"Structural changes during aging of martensite in chromium-nickel steel."

report submitted for 3rd European Regional Conf, Electron Microscopy, Prague, 26 Aug-3 Sep 64.

VARLI, K. V.; SKAKOV, Yu. A.; UMANSKIY, Yu. S.

"Some morphological peculiarities of decompsotion of supersaturated solid solutions in copper-base alloys."

report submitted for 3rd European Regional Conf, Electron Microscopy, Prague, 26 Aug-3 Sep 64.

POPOV, N.M.; SKAKOV, Yu.A.

Investigating the structure of the K4ONKhM alloy by transmission electron microscopy. Izv. vys. uchet. zav.; chern. met. 7 no.3: 143-147 '64. (MIRA 17:4)

1. Moskovskiy institut stali i splavov.

L 9068-65 EWT(m)/EPR/EWP(k)/EWP(b) Pf-4/Ps-4 ASD(f)/ASD(m)-3/AFMDC
JD/HW
ACCESSION NR: AP4030658 S/0129/64/000/004/0002/0005

AUTHOR: Varli, K. V.; Skakov, Yu. A.; Sokolova, N. G.; Shpitsberg, A. L.

TITLE: Work-hardening of chromium-nickel stainless steels with aluminum and titanium during heat treatment

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 4, 1964, 2-5 and top half of insert facing p. 24

TOPIC TAGS: steel, stainless steel, chromium nickel steel, chromium nickel stainless steel, heat treatment, steel work hardening aluminum, titanium, steel aging

ABSTRACT: The changes in the structure, phase composition and some properties resulting from the aging of chromium-nickel stainless steels were studied. The test specimens were water quenched from 950C and squeeze rolled by 20 and 80%. The aging was carried out at 500 and 600C after hardening or after hardening and deformation. Holding up to 3000 hours was effected at 500C. The x-ray phase analysis of the alloy was carried out on wire type specimens of 0.7 to 0.8 diameter and on powders. The separation phase compostion was determined by

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L 9068-65
ACCESSION NR: AP4030658

electrolytic dissolution of the test samples after aging for 1000 and 3000 hours at 500C and for 100 to 400 hours at 600C. Hardness was determined by Vickers hardness number with a 1 kg load. The amount of residual austenite was determined by comparing the intensity of the lines of the α-phase and of the γ-phase, as well as by measurement of the amount of magnetic saturation. Five different heats were tested this way. The basic growth of hardness as a result of aging at 500C in the case of heat 1, 3, and 5 occurs at holding up to 30 minutes. The hardness does not change too much at more prolonged aging up to 100-200 and even 1000 hours. The hardness lowers after aging for 1000-3000 hours. The amount of austenite is reduced somewhat with short-duration holdings. Hence, work hardening as the result of aging is not directly associated with martensitic transformation. Its work hardening proceeds in the martensitic component, however. The capability of martensite to work harden during annealing is associated with the presence of Al or Ti; the ratio of the chromium and nickel content does not have an essential significance. The electrical resistance is greatly reduced as the result of aging, especially in the first 30 minutes. The change in the alloy's properties as a function of aging time corresponds to the ordinary changes during the decomposition of the supersaturated solid solutions.

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L 9068-65
ACCESSION NR: AP4030658

The hardness values attain maximums and then diminish; the electric resistance continually lowers. X-ray and microstructural analyses of the given alloys did not confirm the fact that precipitation hardening occurs. Chemical analysis of the precipitate from heat showed the ratio of nickel to the sum of Ti and Al (in atomic fractions) to be:

$$\frac{0.71}{0.23 + 0.06} = 2.4$$

The work hardening of the heats in question occurs on account of the α-component, which is formed as the result of martensitic transformation. The martensitic structure obviously has such lattice defects that impurities (Ti and Al atoms in this case) interact with them at an elevated temperature. It is quite possible that this interaction also causes work hardening and has a vital effect upon the aging kinetics. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute for Steel and Alloys)

SUBMITTED: 00 ENCL: 00
SUB CODE: MM NO REF SOV: 004 OTHER: 000

Card 3/3

L 19478-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(b) ASD(m)-3 MJW/JD

ACCESSION NR: AP4047511 S/0129/64/000/010/0049/0051

AUTHOR: Spiridonov, V. B.; Skakov, Yu. A.; Iordanskiy, V. N.

TITLE: Microstructure of martensite in chromium-nickel steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1964, 49-51

TOPIC TAGS: chromium nickel steel, Kh17N4M2D steel, austenitic martensitic steel, precipitation hardenable steel, steel martensite, martensite structure, martensite strength

ABSTRACT: The structure of martensite in Kh17N4M2D precipitation-hardenable steel (0.09%C, 16.65% Cr, 4.29% Ni, 2.25% Mo, 1.34% Cu) has been studied with a transmission electron microscope. It was found that the structure of martensite depends upon the conditions of formation. Subzero treatment at -70C for 2 hr transformed 80—85% of the austenite into martensite consisting of a mixture of needles and lamellos with twin crystals 100—2000 Å wide. In wider twins, some dislocations were observed. Needles contained no twins, but a considerable number of dislocations. High tempering at 750C for 1.5 hr and

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L 19478-65
ACCESSION NR: AP4047511

Subsequent cooling to room temperature transformed practically all the austenite into acicular martensite without twins but with a significant number of dislocations. The tensile and yield strengths of martensite obtained by subzero treatment were 140—150 kg/mm^2 and 100 kg/mm^2. Those of martensite obtained by tempering were lower: 105—110 kg/mm^2 and 80 kg/mm^2. Individual crystals of martensite observed in residual austenite containing stacking faults confirmed the assumption about the nucleation action of stacking faults which otherwise appear to limit the growth of martensite crystals. Orig. art. has: 3 figures.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 003 ATD PRESS: 3159

Card 2/2

L 15025-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ASD(m)-3/AFETR JD
ACCESSION NR: AP4049106 S/0129/64/000/011/0019/0024

AUTHOR: Spiridonov, V. B.; Skakov, Yu. A.; Iordanskiy, V. N. B

TITLE: Changes with aging in the properties of martensite of chromium-nickel steels

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1964, 19-24

TOPIC TAGS: chromium nickel steel, cold treatment, straining, heat treatment, martensite, aging

ABSTRACT: The dependence of the aging effect on the structure of martensite, i.e., on the method of obtaining martensite, in stainless, austenitic-ferritic, Cr-Ni steels has been investigated. In four semiaustenitic stainless steels containing 0.07—0.09% C, 15.03—16.65% Cr, and 4.29—9.53% Ni alloyed with Al, Mo, Mo and Cu, or Mo and Al, martensite was formed by subzero treatment at -70C for 2 hr, by cold rolling with a 15—17% reduction, or by cooling after tempering for 1.5 hr at 750C. Changes in the mechanical properties and electrical resistivity were studied in the steels aged for up to 3 hr at temperatures ranging from 400 to 550C. Rapid and slow stages in the changes caused by aging in the properties of Cr-Ni steels with a martensitic structure were observed. The two stages were particularly noticeable in steels alloyed with Cu or Al. In steels alloyed with Mo, the main change in

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L 15025-65
ACCESSION NR: AP4049106

properties occured in the first minutes of aging. In both stages, aging is determined by diffusion. In the first stage of aging, the diffusion consists mainly in a "drift" of dissolved atoms toward dislocations under the action of the stress field, while in the second stage, a normal diffusion caused by chemical gradients takes place. The strengthening with aging probably occurs in the initial stage of martensite decomposition when the dislocations are pinned. The nature and concentration of the structure defects affect the kinetics of strengthening and weakening with aging. The structure defects of martensite formed by cold treatment are more stable than the defects of martensite formed by straining or heat treatment. As a result, cold-treated steels get higher mechanical properties with aging, and are less susceptible to weakening with overaging than the steels with a martensitic structure formed by straining or heat treatment. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 007 OTHER: 001 ATD PRESS: 3143

Card 2/2

SKAKOV, Yu.A.; MEZHENNYY, Yu.O.; YEDNERAL, N.V.

Defects of packing and segregation in cobalt-base alloys.
Fiz. met. i metalloved. 17 no.5:773-774 My '64.
(MIRA 17:9)

1. Moskovskiy institut stali i splavov.

L 22544-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b) Pf-4 MJW/JD/HW

ACCESSION NR: AP5002352 S/0126/64/018/006/0929/0930

AUTHOR: Spiridonov, V. B.; Skakov, Yu. A.; Iordanskiy, V. N.

TITLE: Morphology of martensite in Kh17N4M2D steel

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 6, 1964, 929-930

TOPIC TAGS: Kh17N4M2D steel, martensite formation, steel deformation, martensite morphology

ABSTRACT: The morphology of martensite obtained by 10-15% deformation of steel at room temperature was investigated. The martensite consisted of 1-2 micron long needles with no internal twinning; the density of dislocations was above 10^{11} cm^{-2}. The hexagonal ϵ-phase was not present. The strength of the martensite formed by deformation was similar to that of martensite obtained by cooling after tempering. Martensite by the latter method could not be really compared with martensite obtained at low temperatures due to the diffferences in carbon content. But comparison of the martensites formed by cold working and by deform-

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L 22544-65
ACCESSION NR: AP5002352

ation led to the conclusion that the morphology of martensite is determined primarily by the temperature of its formation. Orig. art. has: 1 figure and 1 table

ASSOCIATION: None

SUBMITTED: 10Dec63 ENCL: 00 SUB CODE: MM

NR REF SOV: 002 OTHER: 002

Card 2/2

L 17074-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ASD(m)-3/AFETR MJW/JD/JW

ACCESSION NR: AP4049919 S/0020/64/159/003/0544/0547

AUTHOR: Spiridonov, V. B.; Skakov, Yu. A.; Iordanskiy, V. N.

TITLE: Changes in the structure and properties with aging of martensite in chromium nickel steels

SOURCE: AN SSSR. Doklady*, v. 159, no. 3, 1964, 544-547

TOPIC TAGS: chromium nickel steel, maraging steel, martensite, subzero treatment, straining, heat treatment, aging, property, structure

ABSTRACT: The kinetics of aging and the effect of aging on the fine structure of martensite have been investigated in three precipitation-hardenable steels: Kh15N9Yo (15.03% Cr, 8.53% Ni, 1.40% Al); Kh16N5M3 (16.20% Cr, 4.78% Ni; 3.30% Mo); and Kh17N4M2D (16.65% Cr, 4.29% Ni; 2.25% Mo, 1.35% Cu). The martensite was formed by the subzero treatment (at -70C for 2 hr), by cold working, or by annealing at 750C for 1.5 hr followed by cooling. The aging-induced change in the properties of steels of this type occurred rapidly in the initial stage and at a rate about two orders slower in the second stage. In a steel alloyed with Mo, the difference in the rate of change was still higher. The activation energy of aging, which ranged from 40 to 57 kcal/g·at, depending on the steel composition and preliminary

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L 17074-65
ACCESSION NR: AP4049919

treatment, remained constant during the entire aging process. This showed that aging is controlled by diffusion in both stages: by a "drift" of the solute atoms toward dislocations during the first stage; and by the diffusion resulting from chemical gradients in the second stage. The kinetics of aging and structural changes occurring in martensite during aging are very similar in steels alloyed with different elements. The differences in the nature of alloying elements promoting the aging and in the final structure of precitated secondary phase appear during later stages of aging. The main changes in the martensite properties appear to occur in the initial stage of aging and to be associated with the formation of segregations and coherent formations. Hence, aging of martensite is a particular case of aging when the matrix has a very high dislocation density, and strengthening takes place during the decomposition stage which precedes the formation of particles of the stable phase and which is different in different steels. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 008 OTHER: 004 ATD PRESS: 3149

Card 2/2

PANCHENKO, Yelena Vasil'yevna, dots.; SKAKOV, Yuriy Aleksandrovich, dots.; KRIMER, Boris Isaakovich, dots.; ARSENT'YEV, Petr Pavlovich, dots.; TSVILING, Mira Yakovlevna, assistent; POPOV, Konstantin Viktorovich, dots.; Prinimala uchastiye SHARSHATKINA, A.V.; LIVSHITS, B.G., doktor tekhn. nauk, prof., red.

[Metallographic laboratory] Laboratoriia metallografii. Moskva, Metallurgiia, 1965. 439 p. (MIRA 18:9)

L 45380-65 EWT(m)/EWP(w)/EWA(d)/EPR/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4/Ps-4
IJP(c) MJW/JD/HW

ACCESSION NR: AP5007008 S/0129/65/000/003/0047/0049

AUTHOR: Spiridonov, V. B.; Skakov, Yu. A.; Iordanskiy, V. N. 38 35 B

TITLE: Electron microscopic study of Kh21N5T steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1965, 47-49

TOPIC TAGS: brittleness, steel hardening, metal mechanical property, heat treatment, metal foil

ABSTRACT: The authors report the results of an electron microscopic study of Kh21N5T steel foil subjected to heat treatment used for massive samples. Mechanical tests of laboratory samples in the hardened state (quenched from 1050°C, 30-min aging, cooling in water) and after additional heating indicate that the steel has a tendency toward embrittlement in the presence of titanium (in excess of amounts necessary for fixing carbon) and aluminum. The embrittlement after tempering at about 500°C is due to separation processes. The tendency toward separation at dislocation-type defects is particularly noticeable at higher aging temperatures (600°C for 8 hr, cooling in air). Diffraction patterns of the same character were

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L 45380-65

3

ACCESSION NR: AP5007008

obtained at 550 and 600°C; this shows that heating to 600-650°C causes solidification of the segregations and an accompanying increase in impact strength. To prevent the embrittlement of Kh21N5T steel, it is necessary to restrict the content of aluminum, titanium, and possibly silicon. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 001 OTHER: 000

Card 2/2

L 57584-65 EWT(l)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c) Pi-4 IJP(c)
JD/GG

ACCESSION NR: AP5013713 UR/0070/65/010/003/0317/0323
548.4

40
39
B

AUTHOR: Maksimov, S. K.; Skakov, Yu. A.

TITLE: The combined effect of packing errors and Suzuki atmospheres on the position and profile of the x-ray line in the face-centered cubic lattice

SOURCE: Kristallografiya, v. 10, no. 3, 1965, 317-323

TOPIC TAGS: atomic physics, crystallography, atomic packing, Suzuki atmosphere

ABSTRACT: The effect of Suzuki atmospheres on the parameters of the x-ray line was considered analytically for small concentrations of packing defects. For simplicity the effect associated with the difference in the scattering capacity and the average atomic radius of the Suzuki atmospheres and of the matrix are considered to be independent and are examined separately. In the case considered the principal contribution is due to the difference in the average atomic scattering capacities of the Suzuki atmospheres and of the matrix. By assuming that the alloy consists of two types of atoms, an expression is derived for this difference. It follows from this expression that for a definite concentration of packing errors this dif-

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ACCESSION NR: AP5013713

ference is determined as a single-valued distribution of the corresponding atoms between the matrix and the segregation. The final expressions for the intensity of scattering are analyzed to show that the occurrence of domains with a different average scattering capacity compared with the matrix causes the line to be asymmetric and that this asymmetry is described by equations which characterize the effect of twinned packing errors. An experimental method is proposed to determine the concentrations of packing errors in the case of Suzuki atmospheres. Orig. art. has: 22 formulas.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 18Nov64 ENCL: 00 SUB CODE: SS, NP

NO REF SOV: 002 OTHER: 007

Card 2/2

SPIRIDONOV, V.B.; SKAKOV, Yu.A.; IORDANSKIY, V.N.

Electron microscopy of Kh21N5T steel. Metalloved. i term. obr. met. no.3:47-49 Mr '65. (MIRA 18:10)

L 09163-67 EWT(m)/EWP(t)/ETI IJP(c) JD/HW/JG

ACC NR: AP7002310 SOURCE CODE: UR/0126/66/021/005/0779/0781

VARLI, K. V. SKAKOV, Yu. A., UMANSKIY, Ya. S., Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

33

"Anomalous Variation in the x-ray Interference Pattern During Aging of Nickel-Beryllium Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 21, No 5, May 66, pp 779-781

TOPIC TAGS: x ray scattering, beryllium alloy, nickel alloy

ABSTRACT: The authors studied anomalous two-dimensional effects in x-ray scattering during aging of nicket-beryllium alloy specimens with two compositions: 1) with 1.32 wt % Be, and 2) with 2.2 wt % Be. The alloys were annealed for maximum hardness. Interference curves are given for the solid solution after various aging periods. Considerable changes are observed in the interference pattern after aging for only 1 or 2 minutes. These changes consist of an anomalous shift in lines (111) and (200) toward one another, the appearance of asymmetry in line (111) toward smaller angles, and a reduction in the intergal intensity of line (200). These changes are all stronger in the alloy with higher beryllium concentration (alloy 2). Lines (111) and (200) begin to move away from one another with longer aging and the intergal intensity of line (200) increases while the asymmetry of line (111) disappears. The line shift may be due to packing defects with or without other structural changes which take place during decomposition of the solid solution. Among the other structural changes which may lead to anomalous line shift are oriented stresses and concentration nonhomogeneity, elastic lattice distortions of a complex type (e.g. monoclinic distortions), and the formation of metastable segregations in the form of thin layers with a hexagonal structure. Orig. art. has: 1 figure. [JPRS: 37,415]

UDC: 546.3-74'45:539.26

0925 0583

Card 1/2

L 09163-67

ACC NR: AP7002310

TOPIC TAGS: x ray scattering, beryllium alloy, nickel alloy

SUB CODE: 11,20 / SUBM DATE: 08Jul65 / ORIG REF: 004 /

Card 2/2 nat

ACC NR: AP6032052 SOURCE CODE: UR/0148/66/000/009/0115/0119

AUTHOR: Varli, K. V.; Skakov, Yu. A.; Umanskiy, Ya. S.; Shpitsberg, A. L.

ORG: Moscow Steel and Alloys Institute (Moskovskiy institut stali i splavov)

TITLE: Effect of molybdenum on the phase composition and microstructure of chromium-nickel steels

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1966, 115-119

TOPIC TAGS: chromium nickel alloy, molybdenum containing alloy, titanium containing alloy, alloy structure, alloy property, alloy heat treatment, PHASE COMPOSITION, STEEL MICROSTRUCTURE, CHROMIUM STEEL, NICKEL STEEL

ABSTRACT: The effect of molybdenum (from 0 to 9%) on structural changes in chromium-nickel steels (17% Cr, 7.5% Ni) has been investigated. The hardness of steels containing 4.3% or more molybdenum significantly increased after water quenching from 1200C and aging in the range 500—900C; the structure of this steel consisted of α- and γ-phases. The x phase was formed after quenching from 1000C, and the amount of α-phase decreased sharply. In steels containing up to 2.3% molybdenum, quenched from 900C, the content of α-phase increased, that of γ-phase decreased, and the steels became magnetic. In steels with 4.3—5.9% molybdenum, quenching from 900C reduced the content of α-phase but caused the formation of x-phase, the amount of which increased with increasing molybdenum content. However, with molybdenum content increased to the content of x-phase decreased and the structure consisted mainly of

Card 1/2 UDC: 669.15-194:669.26'24.046.51:669.28.620.183:541.412

ACC NR: AP6032052

γ-phase. An increase of molybdenum from 2.3 to 5.9% increased the amount of δ-ferrite from 30 to 70%. Maximum hardness (400 HV) was obtained in steels containing 8—9% molybdenum after aging at 850C. No hardness increase was observed in steels with 4% molybdenum or less aged at the same temperatures. An increase of molybdenum content and hardness brings about embrittlement in the range 600—1100C. Orig. art. has: 4 figures. [AZ]

SUB CODE: 11, 13/ SUBM DATE: 20Oct65/ ORIG REF: 004/ OTH REF: 002

Card 2/2

L 34159-65 EEC(b)-2/EWA(c)/EWT(1)/EWT(m)/EWP(b)/T/EWP(t) IJP(c) JD

ACCESSION NR: AP5008137 S/0286/65/000/005/0013/0013

AUTHOR: Tuzovskiy, A. M.; Skakovskiy, I. I.; Pesotskiy, G. S.; Aleshin, A. M.; Shniger, V. E.; Dmitriyev, N. V. 34 B

TITLE: Crucible for growing crystals from a melt. Class 12, No. 168639

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 5, 1965, 13

TOPIC TAGS: crystal growing, crucible, semiconductor, single crystal 21

ABSTRACT: This Author Certificate introduces a crucible in which the oxide layer is separated from the melt by a centrally located chamber (see Fig. 1 of the Enclosure). [VS]

ASSOCIATION: none

SUBMITTED: 20Jan64 ENCL: 01 SUB CODE: IE, SS

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3212

Card 1/2

SNARSKI, Stanislaw, kpt. lek. (Warsaw)

Certain designing problems of ship engines. Bud. okrętowe Warszawa
10 no.1:25-[illegible] Ja '[illegible].

Skakul

U.S.S.R. / Human and Animal Physiology. Liver. T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 22269.

Author : ~~Skakul, N. P.,~~ Sereda A. Y.
Inst : Not given.
Title : The Effect of Tetamon-I on Bile Secretion of the Liver.

Orig Pub: Bul eksperim. biol. i meditsiny, 1957, No 1, prilozhenic, 99-101.

Abstract: Tetzamon-1(T) (Tetraethyl ammonium iodide) was injected intramuscularly in 4 dogs with permanent gall bladder fistulae, and ligated common ducts. The volume of bile salts was determined at hourly intervals for a period of 4 hours. Injection of T under conditions of spontaneous bile secretion and also during digestion

Card 1/2

SKAKUN, A.D., master-povar (Khar'kov).

From my experience. Zdorov'e 4 no.12:28 D '58 (MIRA 11:12)
(VITAMINS)

ACC NR: AP6014704 (A) SOURCE CODE: UR/0360/65/000/004/0064/0072

AUTHOR: Khasanova, N. F.; Skakun, A. I.; Gladyshev, G. P.

ORG: none

TITLE: Kinetics of photopolymerization of styrene at low temperature

SOURCE: AN KazSSR. Izvestiya. Seriya khimicheskikh nauk, no. 4, 1965, 64-72

TOPIC TAGS: styrene, polymerization kinetics, low temperature phenomenon, quinone, chemical reaction kinetics, photopolymerization

ABSTRACT: Purified and vacuum distilled styrene (b.p. 38C at 25 mm Hg) was photopolymerized with diacetyl (b.p. 84C at 700 mm Hg) in the range of +40 to -25C. Rate of initiation was controlled by a quinone retardant. A mercury lamp served as the light source. The results are plotted graphically and indicate significant deviations from the Arrhenius equation. Activation energy calculated from initial reaction rate values decreased from 12.5 kcal/mol at 30C to 3.8 kcal/mol at -25C. Molecular weights were derived from the synthesized polymers. Their decrease in the low temperature range proved abnormally severe. Activation energy of the initiation reaction was calculated for the entire temperature range and varied from 8.0 to

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CZECHOSLOVAKIA

SKALA, J.; Psychiatric Clinic, Faculty of General Medicine, Charles University (Psychiatricka Klinika Fakulty Vseobecneho Lekarstvi KU), Prague.

"Application of a Regime Treatment of Alcoholics under Conditions of a Tent Camp."

Prague, Ceskoslovenska Psychiatrie, Vol 62, No 3, Jun 66, pp 186 - 188

Abstract [Author's English summary modified 7: 37 patients, some voluntary, and some directed for the treatment by the authorities, were treated for 14 days in a tent camp. A complex therapeutic treatment was administered at the camp by paramedical personnel and by 6 former patients who became abstinents after a course of treatment. Good results in psychotherapy were achieved. No references. (Manuscript received Nov 63).

1/1

SKAKUN, G. F.

"Technology of Spot Welding of Some Chrome-Nickel Steels and Alloys." Sub 14 Jun 51, Moscow Aviation Technological Inst **Candidate of Technical Sciences**

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

ACCESSION NR: AP4040698 S/0135/64/000/006/0016/0019

AUTHOR: Chakalev, A. A. (Engineer); Zaytsev, V. I. (Engineer); Skakun, G. F. (Candidate of technical sciences); Mel'nikov, Yu. V. (Engineer)

TITLE: Vacuum-tight seam welding of MA8 alloy

SOURCE: Svarochnoye proizvodstvo, no. 6 (630), 1964, 16-19

TOPIC TAGS: magnesium manganese cerium system, magnesium manganese alloy, cerium containing alloy, MA8 alloy, alloy welding, seam welding, alloy weld, vacuum tight weld, airtight weld

ABSTRACT: The conditions for obtaining airtight seam-welded joints in sheets of MA8 magnesium alloy (1.5—2.5% Mn; 0.3% each Al and Zn; 0.15—0.35% Ce; 0.05% each Cu and Fe; 0.02% Be; 0.15% Si; 0.01% Ni) have been determined. Flat specimens, assembled from sheets of the same or different thickness which varied from 1 to 4 mm, and shells 400, 800, and 1500 mm in diameter, made from 1.5-mm sheets and reinforced with outside ribs 1.8-mm thick, were seam welded. To compensate

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