

U.S.S.R.

The 704-243 automatic centerless grinding machine for the
generatrix of barrel rollers. Izv. tekhn.-ekon. inform. ts.
nauch.-issl. inst. nauch. i tekhn. inform. 17 no. 8: 1-57
Ag 164.

ROGATNIKOV, L.R.

The LZ-52-type centerless-lapping machine. Biul. tekhn.-ekon.
inform. no.5:41-42 '59. (MIRA 12:8)
(Grinding machines)

ROGATOVSKIKH, G. M.: Master Med Sci (diss) -- "The effect of simultaneous helminthiases on the course of dysentery, and dehelminthization with oxygen". Ryazan', 1959. 14 pp (Ryazan' Med Inst im Acad I. P. Pavlov), 200 copies (KL, No 15, 1959, 120)

ROGATOVSKIKH, G.M.

Disturbance of the antitoxic function of the liver in typhoid.
Klin.med.,Moskva 18 no.11:95 Nov 50. (CML 20:5)

1. Of the Department of Infectious Diseases (Head--Prof.M.S.
Lifshits), Voronezh Medical Institute, Voronezh.

~~SECRET~~ A

178-N. The Influence of Ammonium Salts on the Corrosion of Powdered Copper. (In Russian.) A. V. Ponomov, T. N. Rogatkina, and A. I. Levin. Zhurnal Prikladnoi Khimii, v. 24, July 1961, p. 720-722.
Experimental study shows that the volatility of the acid forming the anion of the salt is the basic factor determining the corrosion activity of the salt. Data are tabulated.
(16, Cu)

ROGATNIKOV, L.B.

Introducing the VSh-300 automatic machine for grinding balls
before and after heat treatment. *Bud. tekhn.-ekon. inform. Gos. nauch.-
issl. inst. nauch. i tekhn. inform.* 18 no. 4:28-29 Ap '65.

(MIRA 18:6)

ROGATNIKOV, L.B.

The VSh-275 special semiautomatic centerless grinding machine.
Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform.
16 no.6:36-38 '63. (MIRA 16:8)

(Grinding machines)

ROGATNIKOV, L.B.

The ZG185 universal centerless grinding machine. Biul.tekh.-ekon.-
inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. no.4:38-40 '62.
(MIRA 15:7)

(Grinding machines)

ROGATNIKOV, L.B.

The VSh-178 machine for filing balls. Biul.tekh.-ekon.inform.-
Gos.nauch.-issl.inst.nauch. i tekhn.inform. no.6:27-29 '62.
(MIRA 15:7)

(Machine tools)

ROGATNIKOV, L.B.

The VSh-120 centerless lapping machine. Biul.tekh.-ekon.inform.
no.11:41-42 '61. (MIRA 14:12)
(Grinding machines)

ROGATNIKOV, L.B., inzh.

New machine tools designed by the Vitebsk Machine-Tool Plant.
Mash.Bel. no.6:17-28 '59. (MIRA 13:6)
(Vitebsk--Machine-tool industry)

ROGATNIKOV, L.B.

VSh-277 special semiautomatic centerless grinding machine. Biul.
tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform.
no.2:41-42 '63. (MIRA 16:2)

(Grinding machines)

ROGATNIKOV, L.B.

VSi-279 special semiautomatic centerless grinding machine. Bil.
tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekhn.inform.
no.2:42-43 '63. (MIRA 16:2)

(Grinding machines)

ROGATNIKOV, L. B.

ROGATNIKOV, L.B., inzh.; NANOS, M.I., inzh.

Twin-spindle head for the 6H82 horizontal milling machine. Mash.
Bel. no.6:168 '59. (MIRA 13:6)
(Milling machines--Attachments)

ROGATNIKOV, L.B.

The BSh-30% semiautomatic ball-roughing machine. Biul.tekh.ekon.inform.
17 no.10:46-47 0 '64. (MIRA 18:4)

ROGATSKIN, B.S., inzh.; SHUL'GINA, L.D., inzh.

Use of PPF-UNIIZ flame photometers in the regulation of water in
electric power plants. Elek. stat. 35 no.1:27-30 Ja '64.
(MIRA 17:6)

50641-111, 112.
VOYNITSKIY, V.Yu.; ROGATSKIN, B.S.

Determining concentrations of reagent solutions in chemical water
treatment. *Energetik* 5 no.4:16-17 Ap '57. (MLRA 10:6)
(Feed-water purification)

ROGATSKIN, B.S., inzhener; SIPUNOV, F.I., inzhener.

Effectiveness of periodic scavenging of boilers through the
lower points. Elek.sta. 28 no.3:88-90 Mr '57. (MLRA 10:5)
(Boilers)

ROGATSKIN, I.I., inzh.

Welding-up of iron castings for the removal of founding defects.
Svar. proizv. no.6:9-10 Je '63. (MIRA 16:12)

1. Moskovskiy zavod "Borets."

IPATOVA, N.N.; ROGATOVSKIKH, G.M.

Comparative clinical-morphological data on acute and chronic
dysenter. Sov.med. 26 no.10:61-67 0 '62. (MIRA 15:12)

1. Iz kafedry infektsionnykh bolezney (zav. - dotsent N.N.
Ipatova) Ryazanskogo meditsinskogo instituta imeni I.P.Pavlova.
(DYSENTERY)

BATENKO. V.F., inzh.; GVOZDEV, V.F., inzh.; VAKHLER. V.A., inzh.; PIL'SHCHIKOV,
A.P., inzh.; ROGATSKIN, B.S., inzh.; BELYAKOVA, L.F., inzh.; KATKOV,
G.S., inzh.

Ion-exchange filters with compound operation in power blocks with
300 Mw. ratings. Elek. sta. 36 no.10:8-15 0 '65.

(MIRA 18:10)

ARKHIPOV, A.M., inzh.; ZHDANOV, V.I., inzh.; ROGATSKIN, B.S., inzh.

Prestart cleaning of water and steam conduits of a 300 Mw. ~~12000~~ Elek.
sta. 36 no.11:14-20 N '65. (MIRA 18:10)

ROGATSKIN, B.S.

104-3-38/45

AUTHOR: Rogatskin, B.S. and Sipunov, F.I., Engineers.

TITLE: The effectiveness of periodic blowing down of boilers from low points. (Ob effektivnosti periodicheskoy produvki kotlov cherez nizniye tochki)

PERIODICAL: "Elektricheskiye Stantsii" (Power Stations), 1957, Vol.28, No.3, pp. 88 - 90 (U.S.S.R.)

ABSTRACT: At present periodic blow down from the low points of drum type boilers is widely used in power stations to remove sludge. There is a large number of low points on each boiler so the work is laborious and much heat and condensate are lost several times a week. Authors of earlier articles have doubted the need for blowing down in this way on medium pressure boilers. The question has now been studied experimentally in a high pressure boiler. Monthly water analysis figures are given for a period of nearly two years in a boiler type Tn-230 of 100 atm. Water circulation diagrams are given and the location of sludge deposits is described.

It is concluded that during normal operation of a boiler the sludge contained in the water is in a state of suspension and is uniformly distributed. Sludge is deposited only at places where the water is relatively still and then it is washed away as soon as the water speed rises. Sludge is not

Card 1/2

104-3-38/45

The effectiveness of periodic blowing down of boilers from low points. (Cont.)

deposited at the lower points of modern high pressure boilers and there is no point in blowing down periodically to remove sludge. When the boiler is shut down, blowing down from the lower points is an effective way of removing sludge. Blowing down from the lower points should only be applied when the boiler is being lit to remove sludge; to discharge water from the boiler; to stimulate circulation in some parts of the boiler during lighting-up periods. There are 3 figures and 3 Slavic references.

AVAILABLE: Library of Congress
Card 2/2

BRESLER, S.M.; MIKHAYLOV, A.N.; ROGATYKH, N.I.

Increased resistance to the washing out of leather fixed
chromium compounds. Nauch.-issl. trudy TSNIKP no.20:33-36
'63 (MIRA 18:1)

ROGAVSKAYA, N. A.

581 FANDEEV, B. V., DERBINA, K. A. i ROGAVSKAYA, N. A.
Kholmogorskiy skot. Pod red. M. S. Blomkvist. M., Sevkhogiz,
1954. 78 s. s ill.; 1 l. kart. 20 sm. 20.000 ekz. 1 r. 5 k.
-54-55225/ p 636.2.082 (47.21)

SO: Knizhnaya Letopis, Vol. 1, 1955

BAYMURADOV, K.; ROGAYEVSKIY, Ya.; TSVETKOVA, S.V., tekhn.red.

[Turkmen S.S.R.; a concise account of its economy and culture]
Turkmenskaia SSR; kratkii ocherk ekonomiki i kul'tury. Moskva,
Izd-vo vostochnoi lit-ry, 1958. 22 p. (MIRA 12:4)
(Turkmenistan--Economic conditions)

ROGAYLIN, G. I. (Moskva)

Neurodermatitis and its treatment. Fel'd. i akush. 21 no.7:7-10
J1 '56. (MIRA 9:10)
(SKIN--DISEASES)

ARUTYUNOV, V.A., prof.; SHUBLADZE, A.K.; BERENBEYN, B.A.; MAYEVSKAYA, T.N.;
ROGAYLIN, G.I.

Marrow-Brooke's contagious follicular seratosiis. Vest. dermat. i ven.
38 no.11 26 34 N '64. (MIRA 18'4)

1. Klinika kozhnykh i venericheskikh bolezney Moskovskogo oblastnogo
nauchno-issledovatel'skogo klinicheskogo instituta imeni Vladimirovskogo
(dir. P.M.Leonenko) i Institut virusologii imeni D.I.Ivanovskogo (dir. -
deystvitel'nyy chlen AMN SSSR prof. V.M.Zhdanov) AMN SSSR.

DERMAN, B.M., kand. tekhn. nauk; ROGAYLIN, M.I.; FERBEROV, I.L. doktor
tekhn. nauk.

Investigating the vapor decomposition process in coal channels.
Podzem. gaz. ugl. no.4:7-9 '58. (MIRA 11:12)

1. Institut goryuchikh iskepayemykh im. G.M. Krzhizhanevskogo
AN SSSR.

(Coal gasification, Underground)

DERMAN, B.M.; ROGAYLIN, M.I.; FARBEROV, I.L.

Study of the relation between the concentration of water vapor and
the rate of its reaction with carbon. Trudy IGI 13:33-38 '60.

(MIRA 14:5)

(Coal gasification) (Water vapor)

DERMAN, B.M.; ROGAYLIN, M.I.; FARBEROV, I.L.

Kinetics of the process of interaction of carbon with steam. Trudy
IGI 16:151-155 '61. (MIRA 16:7)
(Carbon) (Steam) (Chemical reaction, Rate of)

DERMAN, B.M.; ROGAYLIN, M.I.; FARBEROV, I.L.

Change of the internal surface of electrode carbon during its reaction
with steam. Trudy IGI 16:156-158 '61. (MIRA 16:7)
(Electrodes, Carbon) (Steam)

CHEN LU-SHEN; ROGAYLIN, M.I.; FARBEROV, I.L.

Interaction of steam with coke obtained from Lisichansk coal.
Trudy IGI 16:159-163 '61. (MIRA 16:7)
(Coal gasification, Underground) (Steam)

ROGAYLIN, V., vrach

Skin care of the face and hands. Okhr. truda i sots. strakh.
6 no.5:22 My '63. (MIRA 16:8)

(Skin--Care and hygiene)

ROGAYLIN, V.I.

Citral therapy of males with trichomonal urethritis. Urologia
no.6:41-44 '64. (MIRA 18:11)

1. Urologicheskoye otdeleniye (zav. V.I.Rogaylin, nauchnyy
rukovoditel' - dotsent A.A.Pomerantsev [deceased]) polikliniki
No.2, Moskva.

ROGAYLIN, V.I.

Skin surface pH changes under the influence of acetone, benzine and white spirit. Vest. dermat. i ven. 37 no.5:20-25 My '63.

(MIRA 17:5)

1. Dermatologicheskoye otdeleniye (zav. - prof. A.P. Dolgov)
Instituta gigiyeny truda i professional'nykh zabolevaniy (dir. -
deystvitel'nyy chlen AMN prof. A.A. Letavet) AMN SSSR.

ROGAYLIN, V.I.

Compound therapy of males infected with trichomoniasis. Urologiia no.6:36-40'62. (MIRA 16:7)

1. Iz urologicheskogo otdeleniya (zav. V.I.Rogaylin) polikliniki no.2, Moskva.
(TRICHOMONIASIS) (URETHRA--DISEASES)

ROGAYLIN, V.I. (Moskva)

Treatment of trichomoniasis in men. Fel'd. i akush. 27 no.3:17-18
Mr '62. (MIRA 15:4)

(TRICHOMONIASIS)

ROGOVIN, Z.A., red.; ROGAYLINA, A.A., red.; SHPAK, Ye.G., tekhn.red.

[Progress in the chemistry and technology of polymers; collected works] Uspekhi khimii i tekhnologii' volimerov; sbornik. Pod red. Z.A.Rogovina. Moskva, Gos.nauchno-te. kn.izd-vo khim.lit-ry, 1960. Vol.3. 1960. 210 p. (MIRA 14:7)

1. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I.Mendeleeva.
(Polymers)

TSURUTA, Teydzi [TSuruta, Teiji], dots.; OVECHKIN, M.K. [translator];
SERGEYEV, A.P., red.; ROGAYLINA, A.A., red.; KOGAN, V.V.,
tekhn. red.

[Preparation of synthetic polymers] Reaktsii polucheniia
sinteticheskikh polimerov. Pod red. A.P.Sergeeva. Moskva,
Goskhimizdat, 1963. 196 p. Translated from the Japanese.
(MIRA 17:1)

1. Inzhenerno-tekhnicheskii fakul'tet Kiotskogo universiteta,
Chlen Obshchestva po issledovaniyu polimerov i chlen Yapon-
skogo knimicheskogo obshchestva (for TSuruta).
(Polymers) (Chemistry, Organic--Synthesis)

TAGER, Anna Aleksandrovna. Prinimali uchastiye: TSVANKIN, D.Ya.;
BORISOVA, T.I.; BURSHEYN, L.L.; SLINKIN, A.A.; DULOV, A.A.;
MIKHAYLOV, G.P., red.; ROGAYLINA, A.A., red.; SHPAK, Ye.G.,
tekh. red.

[Physical chemistry of polymers. Fiziko-khimiia polimerov.
Moskva, Goskhimizdat, 1963. 528 p. (MIRA 16:12)
(Polymers)]

PIK, Iosif Shepshelovich; PORZHITSKIY, I.I., red.; ROGAYLINA,
A.A., red.

[Press-moulded cast and formed plastics; a handbook]
Pressovochnye, lit'evye i podelochnye plasticheskie
massy; spravochnoe posobie. Moskva, Khimiia, 1964.
379 p. (MIRA 18:1)

LOSEV, Ivan Platonovich [deceased]; TROSTYANSKAYA, Yelena Borisovna;
ROGAYLINA, A.A., red.

[Chemistry of synthetic polymers] Khimiia sinteticheskikh
polimerov. 2. izd. Moskva, Izd-vo "Khimia," 1964. 640 p.
(MIRA 17:7)

STREPIKHEYEV, Aleksandr Aleksandrovich [deceased]; DEREVITSKAYA,
Varvara Andreyevna; ROGAYLINA, A.A., red.; KOGAN, V.V.,
tekhn.red.

[Principles of the chemistry of macromolecular compounds]
Osnovy khimii vysokomolekuliarnykh soedinenii. Moskva,
Gos.nauchno-tekhn.izd-vo khim. lit-ry, 1961. 354 p.
(MIRA 14:5)

(Macromolecular compounds)

ROOB, D. [Boquet, D.]

Why did the scientists die who entered the Tutankhamen tomb. Nauka
i tekhnolozhiya no.8:16-18 Ag '57.

ROGECZY, S.

New method of surgery in the treatment of urinary incontinence
in women: "sella plastica". Cesk. gyn. 28 no.5:332-336 Je '63.

Por.-gyn. odd. OUNZ v Dum. Strede, veduci MUDr. S. Rogeczy.
(URINARY INCONTINENCE, STRESS) (FASCIA)
(TRANSPLANTATION) (GYNECOLOGY)

ACCESSION NR: AP4034051

S/0126/64/017/004/0527/0535

AUTHORS: Gil'dengorn, I. S.; Rogel'berg, I. L.

TITLE: The study of high-temperature oxidation of nickel-silicon alloys

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 4, 1964, 527-535

TOPIC TAGS: nickel silicon alloy, high temperature oxidation, electronography, oxide formation, thermocouple, adhesion/ H1 brand nickel, KrO brand silicon, URS 50I radiographic apparatus, ADV 200 balance

ABSTRACT: In this work the kinetics of oxidation of alloys of Ni with 0.9-6.4% by wt of Si were studied at temperatures of 1000, 1100, and 1200C. On the basis of electronographic and radiographic investigations of the phase properties of the oxide layers it is shown that alloying of Ni with Si increases the cinder resistance of Ni and that this is due to the formation of SiO₂ in the suboxide layer. The alloy was prepared from H1 brand nickel (Ni > 99.94%) and KrO silicon (Si > 90%) in a high-frequency induction furnace in magnesite crucibles using argon at a pressure 1 atm. The ingot (450 g wt) was rolled to a thickness of 0.4 mm. From these cold rolled bands specimens 25 x 60 mm were cut. These specimens were then polished with a paper No. 2/0, degreased in benzene and in acetone, and

Card 1/2

ACCESSION NR: AP4034051

stored in a dessicator until tested. The rate of oxidation in the process of isothermal exposure was determined by periodically weighing the specimen, using a balance of the type ADV-200. The temperature during oxidation was maintained to an accuracy of $\pm 5^{\circ}\text{C}$. The oxidation proceeded in air at atmospheric pressure for 10 hrs at 1000 and 1100C and for 10 and 50 hrs at 1200C. The phase properties of the oxide layer were studied with the aid of radiographic apparatus of the type URS-501 and by electronographic methods. The results of the experiments showed that the addition of silicon increased the cinder resistance of Ni in the process of oxidation at temperatures of 1000-1200C. The cinder resistance of alloys with 5-7% Si was considerably higher than that of pure Ni. The kinetics of oxidation in the majority of cases obeyed an approximately parabolic law. The basic factor influencing the oxidation appeared to be the formation of a surface of NiO-SiO₂ alloy. The adhesion properties of the oxide film on alloys with 2.6 to 6.4% Si were less than the adhesion properties of the film on pure Ni or low-alloyed Ni. With increased time of exposure, the adhesion of the oxide layer had a tendency to increase. Orig. art. has: 6 figures and 4 tables.

ASSOCIATION: Institut giprotsvetmetobrabotka (Institute of Nonferrous Metallurgy)

SUBMITTED: 01Mar63

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 009

Card 2/2

ACCESSION NR: AP4040499

S/0136/64/000/006/0066/0071

AUTHOR: Volkogon, G. M.; Rogel'berg, I. L.

TITLE: Effect of certain elements on nickel ductility at high temperatures

SOURCE: Tsvetny*ye metally*, no. 6, 1964, 66-71

TOPIC TAGS: nickel, nickel hot shortness, alloyed nickel, nickel ductility, alloyed nickel ductility, nickel alloy, alloy hot shortness, alloy hot ductility, alloy ductility, nickel magnesium alloy, nickel calcium alloy, nickel strontium alloy, nickel titanium alloy, nickel zirconium alloy, nickel hafnium alloy, nickel boron alloy, nickel lanthanum alloy, nickel cerium alloy

ABSTRACT: The effect of alloying elements on nickel ductility at temperatures of 20—550C, 550—950C, and 1000—1100C has been investigated. Unalloyed nickel is brittle at 400—950C, and especially at 800C. Alloying with lithium increases ductility at 400—800C; reduction of area reaches 30% at 0.1% Li. At 1000—1100C the ductility of nickel alloyed with Li is very high, and the reduction of area is 90—100%. Magnesium, calcium, and strontium at low contents increase
Card 1/3

ACCESSION NR: AP4040499

the ductility at 550—950C, but at contents of 0.2—0.3% Mg or 0.1% Ca or Sr have an adverse effect. Beryllium has no effect on ductility at 500—900C, but has a beneficial effect at high temperature. Boron, in the amount of 0.02—0.05%, increases the ductility, especially at 550—950C. However, beryllium at contents over 0.05% makes nickel brittle at all temperatures. Aluminum worsens hot shortness of nickel, especially at higher contents. Lanthanum-group metals (La, Ce, Pr) improve ductility at all temperatures, provided their content is below 0.053—0.072%. Titanium, zirconium, and hafnium have a beneficial effect at 500—900C. Titanium has a weaker effect than zirconium and hafnium, and an excess of it does not affect the ductility. Vanadium, tantalum, phosphorus, chromium, molybdenum, and tungsten decrease the ductility, especially at low temperatures. Manganese and rhenium have no beneficial effect, even if added in considerable quantity. Rhenium, at low contents, widens the range of hot shortness. It follows, therefore, that Li, Mg, Ca, Sr, B, Ce, Ti, Zr, and Hf increase the ductility and eventually eliminate hot shortness in nickel completely. The above elements apparently have a high affinity to sulfur (which is the main cause of nickel brittleness) and their sulfides have a high melting point. Lithium is the strongest modifier; it eliminates columnar

Card 2/3

ACCESSION NR: AP4040499

structure and substantially reduces grain size. Ti, Ce, Ca, Zr, and Mg have much weaker grain-refining effect. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 06Jul64

ENCL: 00

SUB CODE: MK

NO REF SOV: 009

OTHER: 004

ATD PRESS: 3041

Card 3/3

BEZEKOVICH-KHANDROS, S.A.; NOVIKOV, I.I.; ROGEL'BERG, I.L.

Effect of initial structure on grain growth during the collective
recrystallization of brass. Trudy Giprotsvetmetobrabotka no.18:
124-126 '60. (MIRA 13:10)
(Brass--Metallography) (Crystallization)

ROGEL'BERG, I.L.; SHPICHINETSKIY, Ye.S.; BARANOVA, L.M.; PUCHKOV, B.I.

Technology of manufacturing and properties of nickel-tungsten alloys
in connection with their use for the manufacture of filamentary-
cathode tubes. Trudy Giprotsvetmetobrabotka no.18:233-242 '60.

(MIRA 13:10)

(Nickel-tungsten alloys)

(Electron tubes)

ROGEL'BERG, I.L.; SHPICHINETSKIY, Ye.S.; AGAFONOV, A.K.; PUCHKOV, B.P.

Some properties of oxygen and sulfur-bearing nickel for anodes.
Trudy Giprotsvetmetobrabotka no.18:243-253 '60. (MIRA 13:10)
(Nickel--Metallography) (Electrodes, Nickel)

18.1215,18.7100

77592
SOV/129-60-2-5/13

AUTHORS: Rakhshtadt, A. G., Rogel'berg, I. L. (Candidates of Technical Sciences), Vorob'yeva, L. P., Puchkov, B. I. (Engineers)

TITLE: Effect of Heat Treatment on Properties and Structure of Beryllium Bronze

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, Nr 2 pp 20-31 (USSR)

ABSTRACT: Beryllium bronze possesses elastic properties, high corrosion resistance, and adequate electric conductivity. It is used for the elastic elements of instruments and devices. Inasmuch as previous works failed to study the elastic properties of this bronze, the authors investigated elastic and relaxation properties of the bronze prepared in the form of thin strip. The modulus of elasticity was determined by the dynamic method according to the frequency of resonant-type vibration of a cantilever

Card 1/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

specimen. Elastic limit was determined by means of longitudinal bending of the specimen according to the method described in Rakhshadt, A. G., and Shtremel', M. A., Collection MVTU imeni Bauman, Physical Metallurgy and Heat Treatment, Mashgiz, 1955. Residual elongation of the external fiber was calculated by formulas of Ye. P. Popov (Popov, Ye. P., Theory and Calculation of Flexible Elastic Parts, Publishing House LKVVIA, 1947). Permissible residual deformation in determining elastic limit amounted to 0.001 to 0.01%. Relaxation characteristic was determined on the strip bend around mandrels of various diameters. The following types of bronze were investigated: (1) Br B2 (Be, 2.07; Ni, 0.2%); (2) Br B2.5 (Be, 2.56; Ni, 0.31%); (3) Br BNT (Be, 1.9 to 2.02; Ni, 0.32; T, 0.19%). For this purpose, 10-kg ingots 40 mm thick were hot-rolled at 600-800° C into 4.5 mm thick strip with maximal reduction of 20-30%

Card 2/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

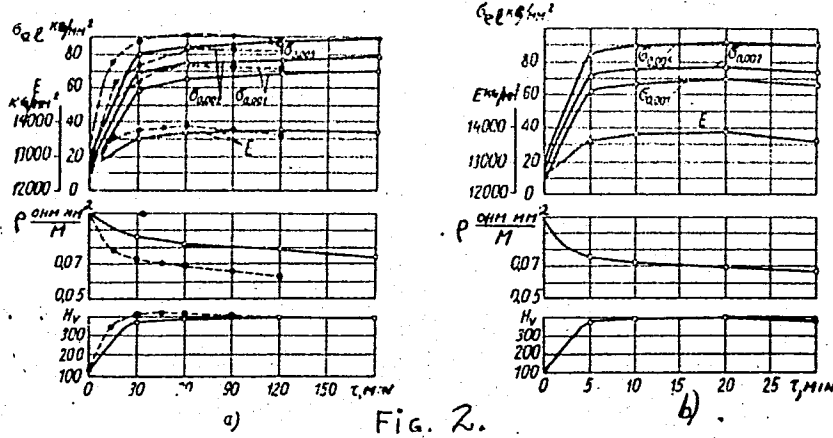
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SOV/129-60-2-5/13

per pass. Rolled strip was hardened from 800° C (holding time 1 hr and water quenching). After pickling, specimens were cold-rolled and hardened according to the above rates at strip thicknesses of 3, 1.5, and 0.7 mm. Then, the strip was rolled to 0.6, 0.43, 0.33, and 0.30 mm thickness. Subsequently, the specimens were hardened in water from 780 to 790° C and rolled to an identical thickness of 0.3 mm; i.e., with reductions of 50, 30, and 10% and without deformation. Hardening from 780 to 790° C (holding for 10 min and water-cooling at 20° C) was done, since such heating brings about a sufficient concentration of beryllium in alpha-solution and fine grain structure (10-15 μ grains). Mechanical and physical properties of the above bronze specimens corresponded to those given in literature for bronzes containing 2 and 2.5% Be. Figure 2 shows changes of elastic properties, hardness, and electrical resistance of bronze Br B2.5 under the effect of tempering. Similar figures are given in the paper for the other two types of bronze.

Card 3/ 10

Effect of Heat Treatment on Properties and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13



See Card 5/10 for caption.

Card 4/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

Caption to Fig. 2 on Card 4/10

Fig. 2. Change of elastic properties, hardness, and electrical resistance of beryllium bronze Br B2.5 after tempering. (a) — at 320° C; ----- at 350° C; (b) at 370° C. σ_{el} , elastic limit; E, modulus of elasticity; ρ , electrical resistance, ohm \cdot mm²; H_v , Vickers hardness; subscripts at m

$\sigma_{0.005}$, $\sigma_{0.002}$, $\sigma_{0.01}$, residual deformation.

Bronze Br BNT 1.9 has a higher elastic limit than the other two types of bronze. It also exceeds that indicated in Richards, J., Materials and Methods, Vol 31, Nr 4, 1950, and in some Soviet references. This may be ascribed not only to a different method of investiga-

Card 5/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

tion but also to the use of thin strip with a highly homogeneous structure. The rate of relaxation at the initial stress equal to elastic limit (at $\sigma_{0.005}$) is higher after tempering at 320° C for 3 hours than that after tempering at 350° C for 1 hour or at 370° C for 20 minutes (see Fig. 7).

Card 6/10

Effect of Heat Treatment on Properties and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

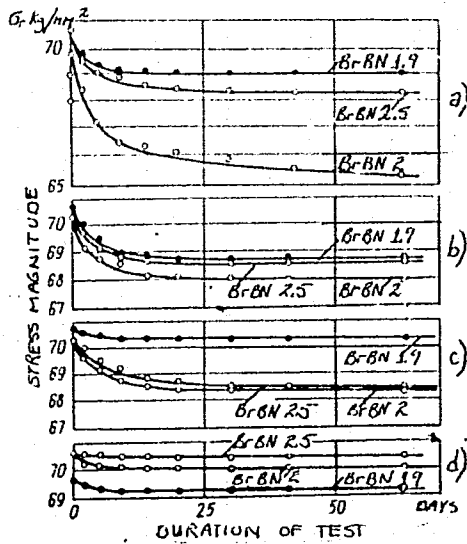


Fig. 7. Change of stresses as the result of relaxation of beryllium bronze at 20° C after hardening and tempering. (a) 320° C, 3 hr; (b) 350° C, 1 hr; (c) 370° C, 20 min; (d) 350° C after reduction of 30%.

Card 7/10

Effect of Heat Treatment on Properties and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

Plastic deformation following hardening strengthens the bronze and increases its elastic limit and hardness, but affects the modulus of elasticity only slightly (see Fig. 9).

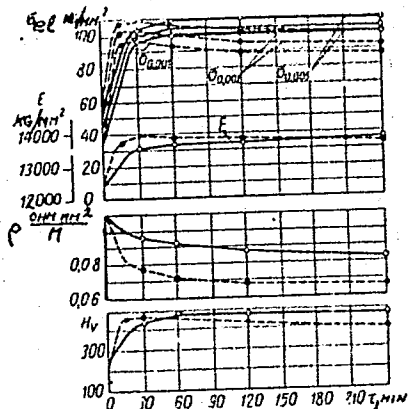


Fig. 9. Change of elastic properties, hardness, and electrical resistance of beryllium bronze Br 2.5 after hardening, cold plastic deformation (reduction 30%), and tempering: at 300° C; ---- at 350° C.

Card 8/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

As a result of this study the following conclusions have been made: (1) heat treatment and plastic deformation drastically affect elastic properties and structure of beryllium bronze; (2) tempering at 350-370° C increases elastic limit and modulus of elasticity of hardened bronze which reaches its maximum with a holding time of 1 hour at 350° C and 20 minutes at 370° C; (3) bronzes containing 2 or 2.5% Be behave identically in regard to strengthening. Additions of Ti bring about a further increase of the elastic limit; (4) bronzes with 2.5 and, particularly, with 2% Be are characterized by nonuniform microscopic decomposition in tempering with higher rates of decomposition along grain boundaries; (5) deformation of hardened bronze changes the state of initially hardened solid solution only with high reduction (30 and 50%); (6) tempering of hardened beryllium bronze subjected to plastic deformation promotes the value of elastic limit ($\sigma_{0.001} =$

Card 9/10

Effect of Heat Treatment on Properties
and Structure of Beryllium Bronze

77592
SOV/129-60-2-5/13

100 kg/mm²). There are 10 figures; 4 tables; and 38 references, 22 Soviet, 12 U.S., 2 German, 1 U.K., 1 French. The 5 most recent U.S. and U.K. references are: Kelly, A., Acta Metallurgica, Nr 8, 1958; Richards, J., ASTM, Spec. Tech. Publication, Nr 129, 1952; Richards, J., Materials and Methods, Vol 31, Nr 4, 1950; Beck, P., Journ. Appl. Physics, Vol 20, Nr 7, 1949; Friedel, J., Phil. Magazine, Vol 44, Nr 351, 1953.

ASSOCIATION: Moscow Higher Technical School imeni Bauman (MVTU imeni Baumana), State Design and Planning Scientific Research Institute for Working of Nonferrous Metals (Giprotsvetmetobrabotka)

Card 10/10

PUCHKOV, B.I.; RAKHSHTADT, A.G.; ROGEL'BERG, I.L.; SOKOLOVA, I.M.

Effect of plastic deformations and heat treatment on the
anisotropy of beryllium bronze hardening and recovery.

Issl. splav. tsvet. met. no.4:224-232 '63.

(MIRA 16:8)

(Beryllium bronze--Hardening)
(Deformations (Mechanics))

L 32263-65 EPR/EWT(m)/EWP(b)/I/EWA(d)/EWP(w)/EWP(t) Ps-4/Pad IJP(c) MJN/

JD/HW

ACCESSION NR: AT4045674

S/2680/64/000/022/0115/0128

AUTHORS: Nuzhnov, A.G. (deceased); Pokrovskaya, G.N.; Puchkov, B.I.; Rogel'berg, I.L.; Tarasova, T.F.

TITLE: Investigation of the effect of composition on the thermo-electromotive force of an "NK" alloy

38
36
31

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i pro-yektnyy institut splavov i obrabotki tsvetnykh metallov. Trudy*, no. 22, 1964. Issledovaniye splavov dlya termopar (Studying alloys for thermocouples), 115-128

TOPIC TAGS: alloy composition, NK alloy, Co, Mn, Al, Si, Ni, Fe, Mg, Cu, thermoelectromotive force

ABSTRACT: The investigated NK alloy contained 15 to 20% Co, approx-imately 2% Mn and Al, 1% Si and Ni. Serious difficulties arose in melting this alloy in industrial furnaces because of an inability to control its electromotive properties. The authors continued experiments on the basis of earlier findings. The effect of the basic components as well as of Fe, Cu and Mg was observed within the 100 to 1000 C range. Al and Si additions proved beneficial for
Card 1/2

L 32263-65

ACCESSION NR: AT4045674

2

thermoelectromotive control of the specimens during melting while the Mn and Co content was maintained on a constant level. At high temperatures, an increase in the Co contents enhanced the thermoelectromotive force. The suggested optimal composition is 1.8 to 2.1% Al, 0.9 to 1.1% Si, 16.5 to 17.5% Co and 1.9 to 2.1% Mn. The orig. art. has: 13 figures and 2 tables.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut splavov i obrabotki tsvetnykh metallov, Moscow (State Scientific Research and Design Institute for Alloys and Processing of Nonferrous Metals)

L 32262-65 EPF(n)-2/EPR/EPA(s)-2/EWT(m)/EPA(bb)-2/EWP(b)/EWA(d)/EWP(t) Ps-4/
Pt-10/Pu-4/Pad IJP(c) WW/JD/HW/JG/WB
ACCESSION NR: AT4045672 S/2680/64/000/022/0062/0071

AUTHOR: Nuzhnov, A.G. (Deceased); Pokrovskaya, G.N.; Puchkov, B.I.; Rogel'berg, I.L.; Tarasova, T.F.

TITLE: Thermoelectromotive force of binary solid solutions on a cobalt base

SOURCE: Moscow. Gosudarstvenny*y nauchno-issledovatel'skiy i proyektny*y institut splavov i obrabotki tsvetny*kh metallov. Trudy*, no. 22, 1964. Issledovaniye splavov dlya termopar (Studying alloys for thermocouples) 62-71

TOPIC TAGS: cobalt, aluminum, beryllium, chromium, copper, iron, germanium, manganese, niobium, nickel, silicon, tantalum, titanium, vanadium, tungsten, molybdenum, zirconium, binary solid solution, thermoelectromotive force, cobalt based solution

ABSTRACT: The authors investigate the thermoelectromotive force of Co solid solutions in the quest for alloys that would be suitable for the production of thermocouples. Specimens contained up to 4% Co and Al, 1.5% Be, 25% Cr, 5% Cu,

Card 1/2

L 32262-65

ACCESSION NR: AT4045672

40% Fe, 5% Ge, 40% Mn, 5% Nb, 10% Ni, 20% Re, 5% Si, 10% Ta, 6% Ti, 15% Va, 13% W, 10% Mo and 2% Zr. Testing temperatures varied between 100 and 1200 C.

The changes in the thermoelectromotive force were found to become increasingly complex as the concentration of the dissolved component was increased and that accurate observations required the measurement of the thermoelectric properties in a state of equilibrium. With heightened concentration of the solid solution, the thermoelectromotive force was observed to decline. In Co alloys having low solubility components such as Cu, Zr and Be, the increased concentration of the alloying element brought about an initial decrease and subsequently a slight increase of the thermoelectromotive force. Only Co-Cr alloys containing over 20% Cr were found suitable for the positive electrode. These alloys possess a satisfactory thermoelectromotive force and earlier investigations show them to be sufficiently oxidation-resistant. (Orig. art. has: 16 figures

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut splavov i obrabotki tsvetnykh metallov, Moscow (State Scientific Research and Design Institute for Alloys and Processing of Nonferrous Metals)

SUBMITTED: 00
NO REF SOV: 000
Card 2/2

ENCLOSURE: 00
OTHER: 005

SUB CODE: MM

L 34482-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) Pad IJP(c) JD/HW/JG/WB

ACCESSION NR: AP5002355

S/0126/64/018/006/0935/0938

21
20
B

AUTHOR: Gil'dengorn, I. S.; Rogel'berg, I. L.

TITLE: The effect of silicon additions on the oxidation of nickel alloy containing 10% Cr

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 6, 1964, 935-938

TOPIC TAGS: nickel chromium alloy, nickel chromium silicon alloy, oxidation, scale formation, oxidation/kinetics

ABSTRACT: The effect of adding up to 4% Si to a Ni-Cr alloy containing 10% Cr on the kinetics of the growth of oxide scales and their structure was investigated.

Card 1/2

L. 34482-65

ACCESSION NR: AP5002355

oxidation zone was reduced by one order. Upon increasing the Si content this in-
oxidation zone was further reduced. α -Cr₂O₃ was formed in addition to

Orig. art. has: 3 figures.

ASSOCIATION: Institut "Giprotsvetmetobrabotka" (State Design and Planning
Scientific Research Institute for the Processing of Nonferrous Metals)

SUBMITTED: 02Mar64

ENCL: 00

SUB CODE: MM

NR REF SOV: 003

OTHER: 007

Card 2/2

SHPICHINETSKIY, Ye.S.; ROGEL'BERG, I.L.; LUZENBERG, A.A.; GOLOMOLZINA, Yu.A.
AGAFONOV, A.K.; Prinimali uchastiye: MIZONOV, V.M.; GALAKTIONOVA,
G.A.; GAVRILOVA, N.G.; SAMSONOV, I.P.; KOPEYKA, E.I.; GLEBOV, V.P.

Investigating the darkening of nickel strips during annealing.
Trudy Giprotsvetmetobrabotka no.20:125-135 '61. (MIRA 15:2)
(Nickel--Heat treatment) (Annealing of metals)

PUCHKOV, B.I.; RAKHSHTADT, A.G.; ROGEL'BERG, I.L.

Characteristics of the hardening and recovery of nickel on the results of cold plastic deformation and annealing. Fiz. met. i metalloved. 16 no.5:781-786 N '63. (MIRA 17:2)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut obrabotki tsvetnykh metallov i Moskovskoye vyssheye tekhnicheskoye uchilishche im. Baumana.

S/136/62/000/006/001/005
E073/E435

AUTHORS: Puchkov, B.I., Rakhshadt, A.G., Rogel'berg, I.L.
TITLE: Anisotropy of the limit of elasticity of commercial copper spring alloys

PERIODICAL: Tsvetnyye metally, no.6, 1962, 67-70

TEXT: The results are given of measured values of anisotropy of the elasticity limit of 0.35 mm thick sheets of bronzes, brasses and German silver of the following compositions:

- Sp.A7 (Br.A7): 7.68% Al, 92.20% Cu, 0.05% Fe;
- Sp.OЦ 4-3 (Br.OTs 4-3): 4.14% Sn, 3.02% Zn, 92.74% Cu, 0.02% Fe;
- Л85 (L85): 14.96% Zn, 84.78% Cu, 0.04% Fe;
- МЦ65-15-20 (MNTs 65-15-20): 19.80% Zn, 15.10% Ni, 64.71% Cu, 0.08% Fe.

All the alloys were investigated after work hardening (rolling with a reduction of 57%) and after annealing at a temperature below the recrystallization temperature. The limit of elasticity was measured by cyclic loading during longitudinal bending. In the work hardened state there is a pronounced anisotropy of the limit of elasticity, the magnitude of which is much higher in the
Card 1/3

S/136/62/000/006/001/005
E073/E435

Anisotropy of the limit ...

direction transverse to rolling (σ'_{el}) than in the direction of rolling (σ''_{el}). The ratio $\sigma'_{el}/\sigma''_{el}$ varied between 1.10 and 1.90. The respective values of the ratio of the moduli of elasticity varied between 1.0 and 1.2; no correlation was detected between the limit of elasticity and the modulus of elasticity. After low temperature annealing (below recrystallization) the increase in the modulus of elasticity of the investigated materials (with the exception of tin bronze) increased appreciably whereby the increase was greatest in the direction of rolling and least transverse to the direction of rolling. Thus, the anisotropy of the limit of elasticity diminished after low temperature annealing. In the tin bronze, low temperature annealing did not reduce the anisotropy of the limit of elasticity. Thus, low temperature annealing does not only improve the elastic properties of tinless bronzes, brasses and German silver but also reduces the anisotropy of their elastic properties. The authors attribute the anisotropy to the distribution of dislocations and the associated field of oriented microstress. The relatively small change in the anisotropy of the limit of elasticity of tin bronzes as a result of low temperature annealing is probably

Card 2/3

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S/126/62/013/005/013/031
E193/E483

AUTHORS:

Puchkov, B.I., Rakhshadt, A.G., Rogel'berg, I.L.

TITLE:

A study of the effect of deformation and annealing
on the anisotropy of the elastic limit of the
7% aluminium copper alloy

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.5, 1962,
728-734

TEXT: In continuation of an earlier investigation carried out
by B.I.Puchkov and I.L.Rogel'berg (FMM, v.10, 1960, 302) the
present authors conducted a systematic study of anisotropy of
the elastic limit (or, more precisely, of the 0.005% proof stress)
of a copper-base alloy containing 7.1% Al, with particular
reference to the effect of both plastic deformation and
annealing temperature as well as the effect of repeated
deformation and annealing. The experimental material was
prepared by hot rolling 40 mm thick billets to 4 mm sheet which
was then reduced cold to 0.35 mm with intermediate annealing at
700°C. The method described in Ref.4 (A.G.Rakhshadt and
Card 1/64

S/126/62/013/005/013/031
E193/E483

A study of the effect ...

M.A.Shtremel'. Zavodskaya laboratoriya, v.30, no.6, 1960, 744; Metallovedeniye i termicheskaya obrabotka metallov, sb.41, MVTU im. Baumana, 1955, 219) was used to determine $\sigma_{0.005}$ of specimens, cut from the cold-rolled sheet at an angle of 30, 45, 60 or 90° to the direction of rolling. The effect of the degree of plastic deformation (in rolling) on the anisotropy of the elastic limit is demonstrated in Fig.1 where $\sigma_{0.005}$ (kg/mm²) is plotted as a function of the orientation of the test piece in relation to direction of rolling, the vertical and horizontal axes representing respectively, directions parallel and normal to the direction of rolling; the degree of plastic deformation is indicated by each curve. The effect of annealing temperature is demonstrated in Fig.3, where $\sigma_{0.005}$ (kg/mm²) of specimens given 50% reduction is plotted against the annealing temperature (°C), curves 1 and 2 relating to values of $\sigma_{0.005}$ in the direction normal and parallel to the direction of rolling, respectively. The effect of some other factors on the anisotropy of the elastic limit is shown in Fig.7, where the vertical and horizontal axes represent again the directions

Card 2/4

A study of the effect ...

S/126/62/013/005/013/031
E193/E483

parallel and normal to the direction of rolling and the various curves, showing the variation of $\sigma_{0.005}$, relate to specimens which had been given the following treatment:

- 1 - rolling to 50% reduction; 2 - rolling to 50% reduction followed by rolling in the transverse direction to 8% reduction;
 - 3 - as in 2, plus 30 min at 280°C; 4 - rolling to 92% reduction;
 - 5 - rolling to 92% reduction followed by rolling in the transverse direction to 8% reduction; 6 - as in 5, plus 30 min at 280°C.
- Several conclusions were reached. 1. The plastic deformation-induced structural changes, causing anisotropy of the elastic limit of the alloy studied, can be fully eliminated by annealing the material below the recrystallization temperature.
2. Anisotropy of the alloy annealed below the recrystallization temperature can be fully restored by light plastic deformation.
 3. Anisotropy of plastically deformed material can be substantially altered by rolling the material in the direction normal to the direction of the first rolling operation, even if only a small reduction (7%) is given in the second rolling operation.
 4. Work-hardening of the alloy studied is very non-uniform, and

Card 3/6

A study of the effect ...

S/126/62/013/005/013/031
E193/E483

even after very heavy reductions some of the slip system show no resistance to further deformation. The deformation- and annealing-induced changes in the anisotropy of the elastic limit of the 7% Al-Cu alloy are associated with a change in the magnitude and mode of distribution of oriented micro-stresses caused by redistribution of the dislocations. There are 7 figures and 1 table.

ASSOCIATION: "Giprotsvetmetobrabotka" MVTU im. Baumana.

SUBMITTED: February 8, 1961 (initially)
December 11, 1961 (after revision)

Card 4/4

PUCHKOV, B.I.; RAKHSHTADT, A.G.; ROGEL'BERG, I.I.

Investigating the effect of deformation and annealing on the anisotropy of the elasticity limit in an alloy of copper with 7-percent aluminum. Fiz. met. i metalloved. 13 no.5:728-734 My '62. (MIRA 15:6)

1. "Giprotsvetmetobrabotka", i Moskovskoye vyssheye tekhnicheskoye uchilishche imeni Baumana.
(Copper-aluminum alloys--Testing)
(Elasticity)

S/680/61/000/020/007/013
D258/D302

AUTHORS: Rogel'berg, I. L., Shpichinetskiy, Ye. S., Puchkov, B.I.
and Titova, A. S.

TITLE: Nickel alloys of high electrical resistivity for cathode
filament bases in radio tubes

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i pro-
sektnyy institut obrabotki tsvetnykh metallov. Sbornik
nauchnykh trudov. no. 20, 1961, Metallovedeniye i obra-
botka tsvetnykh metallov i splavov, 117-124

TEXT: The present work was aimed at developing Ni alloys suitable
for the manufacture of filament bases in the so-called 'economical'
radio tubes. Suitable alloys were required to possess electrical
resistivities, of 42 microhms-cm at room temperature and of 114
microhm-cm (at least) at 850°C. 84 different alloys were prepared
by quickly melting the charges in a high-frequency furnace. The
products were subsequently reduced with C and Mg, poured in gra-
phite forms, water-quenched from 1100°C, then rolled, annealed at

Card 1/3

S/680/61/000/020/007/013
D258/D302

Nickel alloys of ...

800 - 850°C and finally drawn, with softening, into 0.5 mm and 2 mm wires. After a heat-treatment at 800°C, the wires were tested for tensile strength (on 2 mm wire, at room temperature and at 850°C) and electrical resistivity (on 0.5 mm wire, at 20 - 950°C). The resistivity at high temperatures was measured under a pressure of

10^{-4} mmHg on electrically heated sample spirals, 5 mm in diameter, made from 1-meter wires. The following systems were investigated: Ni-Co; Ni-Fe (with up to 8% Fe); Ni-Ti; Ni-Fe-Ti; Ni-Co-Ti; Ni-Co-Fe-Ti, with and without additions of either Al, Si, Mg or Mo; and Ni-Fe (with 40 to 50% Fe) with small amounts of either Ti, Al or Si. Only the last series was found to satisfy both electrical and mechanical requirements. A survey of the other systems showed that the electrical resistivity of Ni at high temperatures is greatly enhanced by the addition of up to 5% Ti; the addition of Mo enhances the low-temperature resistivity only. The Ni-Fe-Ti alloys are recommended for use in cathode bases, in view of their good electro-resistivity and mechanical strength and also because of

Card 2/3

Nickel alloys of ...

S/680/61/000/020/007/013
D258/D302

their marked plasticity. There are 3 figures, 2 tables and 2 Soviet-bloc references.



Card 3/3

GU'BYNGON, I.S.; RYB'BYNG, I.S.

Investigating high-temperature oxidation of nickel-chromium alloys. Fiz. met. i metallurg. 17 no.4:527-535 1964.

(MIRA 17:8)

1. Gosudarstvenny nauchno-issledovatel'skiy i proyektnyy institut splavov i obrabotki tsvalaykh metallov.

S/680/61/000/020/008/013
D258/D302

AUTHORS: Shpichinetskiy, Ye. S., Rogel'berg, I. I., Luzenberg,
A. A., Golomolzina, Yu. A. and Agafonov, A. K.

TITLE: Investigating the darkening of nickel strip due to an-
nealing

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i pro-
yektnyy institut obrabotki tsvetnykh metallov. Sbornik
nauchnykh trudov. no. 20, 1961. Metallovedeniye i obra-
botka tsvetnykh metallov i splavov, 125-135

TEXT: The authors investigated the effect of composition and of
various technological factors on the occasional darkening of nickel
strip (grades HR2 (NP2) and HK02 (NK02)), occurring after heating
for 4 hours up to 780 - 800°C, annealing for 3 hours and cooling
to room temperature over 8 - 10 hours. Darkening was due to the
formation of a strongly adhering 10^{-5} - 10^{-6} cm thick film which
was found to consist of carbon. The effect of composition on dar-

Card 1/4

S/680/61/000/020/008/013
D258/D302

Investigating the darkening ...

Darkening was investigated on thinly rolled samples of darkened strip; the specimens were electropolished and reheated in vacuo. They were then slowly cooled or quenched from 780°C. Films were formed on all slowly cooled specimens with more than 0.04% C and 0.04% Si, but not on quenched specimens. Microscopic study showed that graphitization usually started from the crystal boundaries. The individual effect of C and Si on darkening was studied with samples annealed in vacuo and containing 0.02 - 0.2% of C, Si, Mg and other reducing agents. With samples containing C alone, the darkening occurred at 0.07% C and more; the presence of Si raised the concentration limit by 0.01%. The effect of lubrication on darkening was studied by coating samples with transformer oil prior to annealing. The presence of oil enhanced darkening in samples containing more than 0.04% C, while it had no adverse effect on samples with lesser concentrations. The chemical analysis of 253 plant-annealed rolls showed that no darkening occurred in rolls containing 0.02 - 0.03% C, while 0.06% C caused intense darkening; the total concentration of reducing agents was, qualitatively en-

Card 2/4

Investigating the darkening ...

S/680/61/000/020/008/013
D258/D302

ly, related to the extent of darkening. Application of various oils in plant conditions always resulted in darkening; yet the removal of these oils, prior to annealing, had little effect on preventing it. No dependence could be established between the composition of furnace gases and the extent of darkening. No change was observed, on substituting hydrogen or water vapor to air in the furnace space, or on annealing in vacuo at 10^{-3} mmHg. The latter treatment even enhanced darkening. The laboratory treatment of quenching showed equally good results when applied in plant practice. Thus, rolls of nickel strip were cleaned, thinned, packed in Ni and Cu foils, heated for 3 hours at 780°C , and quenched in water. Only two out of ten quenched rolls showed traces of darkening in their middle portions. Finally, Ni strip was annealed by continuously passing it through an electrical furnace, under hydrogen, at 850°C , at a rate of 3 - 5 m/min. This treatment completely prevented the occurrence of darkening, provided the strip was quenched immediately on leaving the furnace. The film is assumed to be formed as a result of the decomposition of a supersaturated Ni-C solid solution. The authors assume that in the course of annealing, carbonized oil

Card 3/4

Investigating the darkening ...

S/680/61/000/020/008/013
D258/D302

diffuses into the metal and is taken up to the limit of C-content in the solid solution at 800°C (0.13% C). There are 4 tables, 5 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: Metals Handbook, Nickel-Carbon, p. 1183, (1948); J. J. Lander, H. E. Kern and A. L. Beach, J. Appl. Phys., 23, 12, (1952).

Card 4/4

33469

S/129/62/000/001/010/011

E193/E383

18-1220

AUTHORS: Rakhshadt, A.G., Rogel'berg, I.L., Candidates of Technical Sciences and Puchkov, B.I., Sveshnikova, G.A., Engineers

TITLE: A study of methods of increasing the strength of copper-base spring alloys

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1962, 45 - 56

TEXT: The object of the investigation described in the present paper was to carry out a systematic study of the effect of mechanical and thermal treatment on the mechanical properties of several copper-base alloys. These included:

Л85 (L85) (84.67% Cu, remainder Zn); Л80 (L80) (79.18% Cu, remainder Zn); Л68 (L68) (67.26% Cu, remainder Zn); Бр.ОФ6.5-0.15 (Br.OF6.5-0.15) (6.4% Sn, 0.20% P); Бр.ОФ4-0.25 (Br.OF4-0.25) (3.56% Sn, 0.28% P); Бр.ОЦ4-3 (Br.OTs4-3) (3.94% Sn, 3.1% Zn); Бр.А7 (Br.A7) (7.63% Al); Бр.КМЦ3-1 (Br.KMts3-1) (2.82% Si, 1.15% Mn); МЦЦ15-20 (MNTs15-20)

Card 1/10₇

33467

S/129/62/000/001/010/011

E193/E383

A study of methods of

(65.19% Cu, 14.75% Ni, remainder Zn). The alloys were melted in an induction furnace and the ingots, after two hot-rolling operations, were cold-rolled with intermediate anneals, the last anneal being carried out on sheet 1.5 mm thick. This was cold-rolled to the final thickness of 0.75, 0.5 or 0.375 mm. The mechanical properties were measured both on cold-rolled material and on specimens subsequently heat-treated. All the tests were carried out two months after the completion of thermal and mechanical treatment. The results can be summarized as follows. 1) Cold plastic deformation increases the hardness, elastic limit, elastic modulus and electrical resistance of all the alloys studied; this effect increases with increasing degree of cold-working and is associated with an increase in the dislocation density, formation of stacking faults and a change in the atomic structure of the alloys. Regarding the effect of alloying additions on the work-hardening characteristic of copper, tin has been found to be more effective than aluminium, silicon or zinc.

Card 2/10
7

33467
S/129/62/000/001/010/011
E193/E383

A study of methods of

2) An additional increase in the mechanical properties, affected by cold plastic deformation, can be obtained by a low-temperature treatment carried out below the recrystallization temperature. The higher the degree of work-hardening, the more pronounced is the effect of this treatment. The changes brought about by cold-working alone or combined with low-temperature annealing are exemplified by the results obtained on aluminium bronze (alloy A7). These are reproduced in Fig. 15, where the increment of the elastic modulus (ΔE , kg/mm^2), elastic limit (σ_{upr} , kg/mm^2), Vickers hardness (HV) and electrical resistivity (ρ , $\Omega\text{mm}^2/\text{m}$) are plotted against the degree of cold deformation (%) without and with subsequent low-temperature annealing (continuous and broken curves, respectively); instead of the true elastic limit, the values of 0.002, 0.005 and 0.01% proof stress ($\sigma_{0.002}$, $\sigma_{0.005}$ and $\sigma_{0.1}$, respectively) are plotted. The increase in the elastic limit brought about by low-temperature annealing can be attributed to the resultant

Card 3/10₇

33467

S/129/62/000/001/010/011
E193/E383

A study of methods of

relief of localized stresses, elimination of point defects, diffusion processes associated with atomic displacements, and redistribution of dislocations. X

3) All the alloys studied in work-hardened condition are anisotropic in respect of their elastic properties. This effect is evidently associated with anisotropic distribution of dislocations on the active slip systems. Since the increase in the elastic limit brought about by low-temperature annealing is not the same in all directions, anisotropy of elastic properties in material subjected to this treatment is practically non-existent. This is demonstrated in Fig. 2, showing the magnitude of $\sigma_{0.005}$ (kg/mm²) in various directions, the vertical and horizontal directions corresponding to directions parallel and normal to the direction of rolling; graph a relates to specimens cold-worked to 60% reduction, graph b to specimens subsequently annealed under optimum conditions, as shown in Table 3; Curves 1 - 4 relate to 1 - L68, 2 - Br. OF6.5-0.15, 3 - Br. KMts3-1 and 4 - MNTs 15-20.

Card 4/10

7

33467

S/129/62/000/001/010/011
E193/E383

A study of methods of

4) None of the alloys studied is in a stable condition after plastic deformation. Brasses, in particular, if loaded under conditions of stress different from those obtaining during the initial cold-working operation, suffer a decrease in strength. This effect is attributed to the destruction of atomic segregation brought about by the first plastic-deformation process.

5) The low-temperature treatment of work-hardened specimens of the alloys studied does not significantly increase their resistance to heavy plastic deformation, which indicates that the combined mechanical and thermal treatment does not bring about effective blocking of dislocations. It is for this reason that a sharp decrease in the elastic limit of brass and bronze A7 is produced when, after plastic deformation followed by low-temperature annealing, they are again plastically deformed even to a very small degree. Consequently, parts made of these alloys and treated in the manner described should not be stressed in service beyond the elastic limit. X

Card 5/10
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E193/E383

A study of methods of

6) Low-temperature treatment of work-hardened alloys increases their relaxation stability. This is demonstrated by the relaxation (stress σ_r , kg/mm² versus time, hours) curves reproduced in Fig. 4 for a - L68, b - L80, c - L85, d - Br.OF4-0.25, e - Br.OF4-3, f - Br.OF6.5-0:15, g - Br.A7, h - Br.KMts 3-1, u - MNTs15-20, Curves 1 relating to specimens cold-rolled to 60% reduction and Curves 2 to specimens subsequently annealed according to the schedules shown in Table 3. In addition, low-temperature treatment increases the stability of elastic properties of the alloys under conditions of cyclic loading. For instance, in the case of a cold-rolled specimen of MNTs alloy, subjected to 10⁵ cycles under a stress of 22.8 kg/mm², the relaxation stress decreased after 360 hours from 57.5 to 26.2 kg/mm²; in the case of specimens which after cold-working were annealed at

Card 6/10

33467

S/129/62/000/001/010/011
E193/E383

A study of methods of

300 °C for 3 hours, the relaxation stress decreased under the same conditions to 38.0 kg/mm² only; the elastic limit decreased by 5% in the former and remained constant in the latter case. There are 9 figures, 3 tables and 36 references: 30 Soviet-bloc and 6 non-Soviet-bloc. The four latest English-language references mentioned are: Ref. 14: O. Izumi - Journal of the Japan Institute of Metals, v.23, 1959; Ref. 34: R. Feder, A. Novick, D.B. Rosenblat - Journal Appl. Phys., v.29, 1958; Ref. 35: Le-Claire, D., Lomer, M.M., Acta metallurgica, v.2, no. 11, 1954; Ref. 36: A. Cottrell, R.G. Stoks - Proc. Royal Soc., v.A233, 1955.

ASSOCIATIONS: MVTU im. Bauman
Giprotsvetmetobrabotka

Card 7/10
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X

L 23843-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) Pad IJP(c) JD/HW/WB

ACCESSION NR: AT4045678

S/2680/64/000/022/0180/0192

AUTHOR: Gil'dengorn, I. S.; Rogel'berg, I. L.

TITLE: Comments on the mechanism of high-temperature oxidation of Ni-Si alloys 15 BH
27 27

SOURCE: Moscow. Gosudarstvenny*y nauchno-issledovatel'skiy i proyektny*y institut splavov i obrabotki tsvetny*kh metallov. Trudy*, no. 22, 1964.

Issledovaniye splavov dlya termopar (Studying alloys for thermocouples), 180-192

TOPIC TAGS: nickel, silicon, oxidation resistance, high temperature oxidation, nickel silicon alloy

ABSTRACT: The investigation concerns the resistance of Ni alloys with 0.9, 1.8, 2.6, 3.6, 4.7, 5.6 and 6.4% (by weight) of silicon melted by method of induction in Argon atmosphere and in magnesite crucibles. Air cast specimens

~5 to 7% Si enhance the oxidation resistance of Ni and lower the rate of oxidation.

Card 1/2

L 23813-65

ACCESSION NR: AT4045678

The kinetics of oxidation of most specimens are described by a law approximating the parabolic law. The heightened oxidation resistance of Ni-Si alloys is attributed to the formation of SiO_2 . Metallographic analysis of scale fractures and oxi-

and the ratio of the outer coarse-grained layer to the inner fine-grained layer was 1:1. Microstructural analysis revealed inner oxidation of specimens containing up to 4% Si with an oxidation zone that increased after the Si contents was lowered, temperatures rose and oxidation time was extended. The increased scale formation on the specimens was attributed to the diffusion of Ni^{2+} and Si^{4+} ions and the counterdiffusion of O^{2-} ions. Orig. art. has: 8 figures and 3 tables

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut obrabotki tsvetnykh metallov, Moscow (State Scientific Research and Planning Institute for the Processing of Nonferrous Metals)

~~SUBMITTED: 00~~

~~ENCL: 00~~

SUB CODE: MM

NR REF SOV: 001

OTHER: 004

Card 2/2