

S/133/62/000/009/005/009
A054/A127

AUTHORS: Kolmogorov, V.L., Candidate of Technical Sciences, Selishchev,
K.P., Engineer

TITLE: Cold drawing of tubes under improved lubricating conditions

PERIODICAL: Stal', no. 9. 1962, 830 - 831

TEXT: Tests were carried out to improve the lubrication in drawing tubes without using mandrels. For this purpose a simple device consisting of a sleeve and a finely dispersed clean high-viscosity sodium soap powder were used. Tubes of "20" and 1X18H9T (1Kh18N9T) grade steel were drawn with a wall-thickness-to-diameter ratio varying between 0.05 and 0.13, at drawing rates of 0.17 - 0.58 m/sec. The soap powder applied forms a dense, glassy, adhesive coating, 0.007 - 0.031 mm thick, on the tube surface, which is sufficient to prevent any direct contact between the drawing die and the tube surface. When this new lubrication method is applied, the service life of the drawing tool will be raised considerably; moreover, stainless steel tubes can be drawn by dies of 12X5MA (12Kh5MA) steel instead of "pobedit" (sintered carbon); the drawing power required will be reduced by 27 - 29%, and stainless steel tubes of a higher surface quality can be

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Cold drawing of....

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produced. An essential condition of using sodium soap powder as lubricant is that the tube surface must be dried carefully prior to drawing. There is 1 figure. -

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut chernykh metallov
(Ural Scientific Research Institute of Ferrous Metals)

V

Card 2/2

KOLMOGOROV, V.L.; ORLOV, S.I.; SELISHCHEV, K.P.; LEKARENKO, Ye.M. [deceased];
POKROVSKAYA, G.N.; TIKHONOV, D.Ya.; BOGOMOLOV, I.F.

Drawing wire of nonferrous metals and alloys in conditions of fluid
friction. TSvet. met. 36 no.12:65-67 " '63. (MIRA 17:2)

L 59481-65 EPF(c)/EWT(m)/EWP(k)/EWA(c)/EWF(b)/T/EWP(v)/EWP(t) Pr-4/Pf-4 DJ/

JW/JD/HW
ACCESSION NR: AR5015177

UR/0137/65/000/005/D035/D035

SOURCE: Ref. zh. Metallurgiya, Abs. 5D208

AUTHOR: Kolmogorov, V. L.; Selishchev, K. P.; Orlov, S. I.

104

TITLE: Drawing of tubes, rods, and wire under conditions of hydrodynamic friction

CITED SOURCE: Tr. Ural'skogo n.-i. in-ta chern. met., v. 3, 1964, 64-81

TOPIC TAGS: drawing, tube, rod, wire, hydrodynamics, friction, hydrodynamic friction, rheological property, lubricant

TRANSLATION: The article presents the results of an industrial test of drawing tubes and wires under conditions of hydrodynamic friction with the use of dies, the results of a study of the rheological properties of lubricants, and the development of a theory of drawing under conditions of hydrodynamic friction. Drawing under conditions of hydrodynamic friction permits increasing the speed of drawing, increasing the durability of the instrument by 11 times,

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L 59481-65

ACCESSION NR: AR5015177

Lowering the energy consumed in drawing by 30%, and eliminating preparation of the metal before drawing. 14 literature titles.
G. Svodtseva.

SUB CODE: 1E,MM

ENCL: 00

Card ¹⁴2/2

AUTHOR:

Selishchev, V.I.

3-7-10/29

TITLE:

On Some Possibilities of Improving Technical Training in Correspondence and Evening Courses (O nekotorykh vozmozhnykh uluchsheniya zaochnogo i vechernego tekhnicheskogo obrazovaniya)

PERIODICAL: Vestnik Vyshey Shkoly, 1957, # 7, pp 45-49 (USSR)

ABSTRACT:

The author states that a characteristic fact in the development of Soviet higher schools is the considerable increase in student training without interrupting the students' industrial work. As an example the author quotes the system of correspondence schooling used by the Ministry of Public Transport which includes the All-Union Correspondence Institute for Railway Transport Engineers (VZIIT), 4 correspondence sections in day vuzes and 26 consultation centers all serving about 20,000 students distributed among 120 railroad centers. The permanent teaching staff, which includes 17 professors and 69 dotsents, is concentrated primarily in the chairs of the VZIIT in Moscow, while about 1,000 part-time teachers - paid by the hour - are used. The author then mentions the shortage of laboratories and qualified teachers in the correspondence school system. He then suggests creating general engineering

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On Some Possibilities of Improving Technical Training in Correspondence and Evening Courses.

and general economics faculties in the existing vuzes for the first years of correspondence training. At the end of the third year, the assignment of the students to certain institutions should be made in accordance with their special ties.

The assignment to a specialized school after the third year should not mean a transfer to a remote institute of the special branch, since special faculties may be reorganized in any nearby related technical vuz. He mentions several vuzes where this has been done and several where it could be done and adds that it must be understood that the suggested reorganization should be applied also to methodical management. In this connection the vuz bases will play an important part. For many special ties one important vuz base would be sufficient; however, in some cases, methodical management could be assigned to vuzes situated in different economic areas.

Finally the author mentions some of his observations relating to evening courses in technical vuzes which are appropriate for workers in industrial enterprises but are not appropriate for students employed, for example, as travelling railroad

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On Some Possibilities of Improving Technical Training in Correspondence and Evening Courses.

workers.

Moreover, students who do not comply with the requirements of day courses, often take refuge in evening courses. As an example the author mentions the evening courses of the Moscow Transport Economics Institute where only 59 out of 720 students are actual transport workers while 398 do not work at all. These students reach the Vith year's course without any practical experience. As a result the institute often releases unqualified specialists.

AVAILABLE: Library of Congress

Card 3/3

AUTHOR: Selishchev, V.I.

SOV/3-58-11-11/38

TITLE: The Form of Industrial Training is Changing (Menyayetsya sodержaniye proizvodstvennogo obucheniya)

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 11, pp 30 - 34 (USSR)

ABSTRACT: In the near future, the number of higher school students will be reinforced by youth having professional and engineering skill. It will, therefore, not be necessary to begin industrial training with the rudiments. This does not mean that measures for improvement of industrial training should be postponed until the reorganization of the secondary school is completed. These two processes should take place simultaneously. The author sets forth his suggestions for the improvement of the industrial training of those students who have no experience. He begins with the on-the-job-training workshops established at the vuzes where the organization of work is poor. As an example of good organization of practical training, the author mentions the Moskovskiy institut inzhenerov zheleznodorozhnogo transporta (Moscow Institute of RR Engineers) and those in Rostov and Dnepropetrovsk, where the internal routine work has been brought close to production conditions. He speaks of the advisability of replacing the pre-diploma practice in the

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The Form of Industrial Training is Changing

SOV/3-58-11-11/38

curricula by an obligatory 6 months' industrial practice before submitting the graduation thesis. A change in the form of industrial practice is already taking place in such transport vuzes as the Leningrad Institute of RR Engineers, where 72 % of the entire number of probationers are working independently, and this is also the case at the Moscow, Tomsk, Novosibirsk and Tashkent institutes. Practical work was especially well organized at the locomotive and car manufacturing plants. He also speaks of the difficulty of finding plants where practical training could take place.

ASSOCIATION: GUUZ Ministerstva putey soobshcheniya SSSR (GUUZ, USSR Ministry of Transportation)

Card 2/2

SELISHCHEV, V. I., inzh.; LIDERS, G. V., dotsent

Track machinery station for student training. Put' i put. khoz.
6 no.9:25-26 '62. (MIRA 15:10)

(Railroads--Track)

(Railroad engineering--Study and teaching)

L 23571-66 EWT(a)/EWP(c)/T/EWP(v)/EWP(k)/EWP(h)/EWP(l)
ACC NR: AP6002600 (A) SOURCE CODE: UR/0286/65/000/023/0095/0095

AUTHORS: Selishchev, Ye. M.; Pashteyn-Sitnikov, N. V.; Volkernyuk, V. V. 35
B

ORG: none

TITLE: Distributive conveyer for automated lines.¹⁴ Class 81, No. 176825
/announced by Special Construction and Technological Bureau for Design of Metal-
Cutting Tools and Equipment (Spetsial'noye konstruktorskoye i tekhnologicheskoye
byuro proyektirovaniya metallovezhushchego instrumenta i oborudovaniya)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 95

TOPIC TAGS: conveying equipment, automation equipment

ABSTRACT: This Author Certificate presents a distributive conveyer for automated lines. Endless closed chains are mounted in the frame of the conveyer and are engaged with drive and tension sprocket wheels. To simplify the design and to increase the operation reliability with various technological handling processes, one of the chains carries pin-shaped push-rods on its outer edge (see Fig. 1). A chute with distributive ports for outlet branches is mounted under the push-rods in the frame of the conveyer. The ports are closed by double-armed spring-loaded

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UDC: 621.867.15 2

L 23571-66
 ACC NR: AP6002600

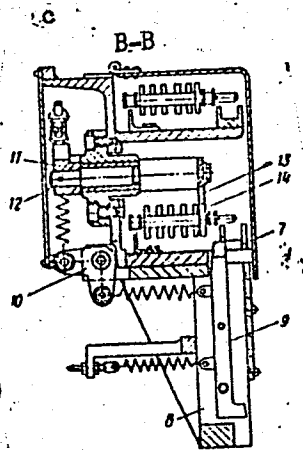
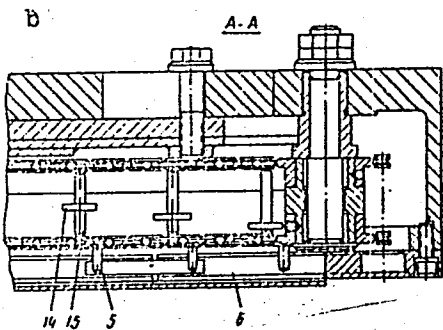
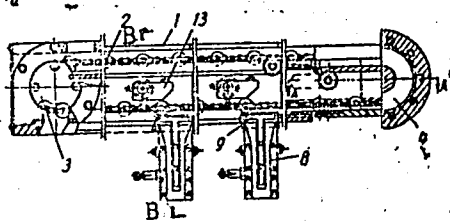


Fig. 1. 1 - distributive conveyer; 2 - end-
 less closed chains; 3 - drive sprocket wheel;
 4 - tension sprocket wheel; 5 - pin-shaped
 push-rods; 6 - chute; 7 - ports; 8 - out-
 let branches; 9 - double-armed spring-loaded
 interceptors; 10 - double-armed spring-
 loaded lever; 11 - lever; 12 - axle; 13 - pawl; 14 - roller;

Card 2/3 15 - axle.

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ACC NR: AP6002600

interceptors which are linked through a system of spring-loaded levers to pawl axles fastened to the frame. During operation of the conveyer the pawls interact with rollers placed on axles mounted between the chains in front of the corresponding push-rods. Orig. art. has: 1 diagram.

SUB CODE: 13/

SUBM DATE: 06Apr64

Card 3/3

PB

ATANASIU, Al., ing.; SELISCHI, N., ing.; LUPSE, T., ing.

Present problems relating to road maintenance. Rev transport
9 no.5:219-221 My '62.

SELISKAR, Ruza

Mineral resources of Algeria. Geogr obz 8 no. 3/4:100 '61.

SELISKAR, S

Development of machine printing in Yugoslavia. p. 622.
TEKSTIL. Vol. 4. No. 6, June 1955. Beograd.

SOURCE: East European Accessions List (EEAL), Library of Congress,
Vol. 4, No. 12, December 1955.

SELISKO, O.

Country :GDR G
Category :Organic Chemistry. Synthetic Organic Chemistry
Abs. Jour : Ref Zhur - Khim., No 5, 1959, No. 15317
Author :Selisko, O.; Schubert, A.
Institut. :-
Title :On Substances with Anti-E-Action. Report III.
Certain New Compound Ethers of Phenols
Orig. Pub. :Ernaehrungsforschung, 1958, 3, No 2, 224-226
Abstract :In continuation of studies begun earlier (re-
port II, see Ref Zhur-Khim, 1958, 43281), a
series of compound ethers (CE) of phenols was
synthesized. 35 g. of o-(I), m-(II) or p-cresol,
12.5 g. of NaOH and 150 ml. of C_4H_9OH are
boiled for 30 minutes, the water is distilled
off, 44 g. of $ClCH_2COOC_2H_5$ are slowly added,
boiled for 15 minutes, 14 g. of NaOH in 150 ml.
of water are added as rapidly as possible,
boiled for another 15 minutes, evaporated, and

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Country : G
Category :
Jbs. Jour : Ref Zhur - Khim., No 5, 1959, No. 15317
Author :
Institut. :
Title :

Orig. Pub. :

Abstract : 2-, 3-, or 4-CH₃C₆H₄OCH₂COOH (III) is precipi-
cont'd. tated by HCl, with a yield of more than 70%.
17 g. of III, 11 g. of II and 8 g. of POCl₃ are
heated at 110-140° up to cessation of the separa-
tion of HCl, cooled to 40°, added to the ex-
cess of the solution of NaHCO₃, and x-CH₃C₆H₄O-
CH₂COOC₆H₄CH₃-y (IV) (x=3, y=2) (IVa), b.p.
175-176°/1 mm. are extracted with ether. Ana-
logously, other IV are obtained (x and y, tem-

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G

Country :
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Abs. Jour : Ref Zhur - Khim., No 5, 1959, No. 15317

Author :
Institnt. :
Title :

Orig Pub. :

Abstract cont'd. : perature of reaction, m.p. in °C. are given):
2, 4, 150-155, 56-57; 3, 2, 90-120, - (b.p. 178-180°/1 mm.); 3, 3, 130-140, - (b.p. 194-196°/1 mm.); 3, 4, 110-120, 59-60; 4, 2, 140-150, 37.5-38.5 (b.p. 168-170°/1 mm.); 4, 3, 135-140, 71-71.5; 4, 4, 130-140, 126-126.5. 40 g. of CH₃CH=CHCOCl (V, VI acid) and 35 g. of I are gradually heated to 120°, cooled and poured into a solution of NaHCO₃, and CH₃CH=CHCOOC₆H₄CH₃-2 is extracted with ether,

Card: 3/5

G

Country :
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Obs. Jour : Ref Zhur - Khim., No 5, 1959, No. 15317

Author :
Institut. :
Title :

Orig. Pub. :

Abstract cont'd. : b.p. 125-127°/12 mm. Analogously, from 22 g. of V, CE of VI are obtained (original phenol, its quantity in g., reaction temperature in °C., b.p. in °C./mm. of corresponding CE of VI are given); thymol, 30, 35-125, 118-120/4; carvacol, 30, 25-125, 116-118/3; $C_5H_{11}COOC_6H_4OCH_3$ -2, b.p. 167°/14 mm., is also obtained from 40 g. of $C_5H_{11}COCl$ and 35 g. of guaiacol (VII) with a reaction temperature from 50 to 140°. 12 g.

Card: 4/5

2 - 11

SELISSKAYA, Ye.A.; OSTRAYA, S.S.

Blackheads and pimples in infants. Vest. dermat. i ven. 33 no.2:
82-83 Mr-Apr '59. (MIRA 12:7)

1. Iz Kozhno-venerologicheskogo dispansera Moskvyy.
(SKIN--DISEASES)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

17

New ointment base for external medication. A. H. Seliskil, *Formations* 1940, No. 9-10, 25-8.—A new ointment base is described which has drying properties and prevents the spread of infection without bandages and without soiling clothing or bedding. It is made of sal: 250, starch 175, glycerol 150, petrolatum 60, fish (or sunflower-seed) oil 50, H₂O 400, gelatin 20 and H₂BO₃ 15 parts.
Julian F. Smith

COMMON ELEMENTS

COMMON VARIABLES INDEX

INTERNAL INDEX

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLES INDEX

INTERNAL INDEX

COMMON ELEMENTS

COMMON VARIABLES INDEX

INTERNAL INDEX

17

CA

Dry concentrates of medicinal pastes. A. H. Seliskil. *Farmatsiya* 8, No. 2, 25-8(1945). Kaolin (I); powd. althea root (II), and mineral oil (III) are useful for making dry concentrates which yield pastes in water or glycerol. In addn. to its gelation capacity, II acts as stabilizer and homogenizer. A concentrate of ZnO paste contains ZnO 15, III 12, II 15, and I 60%; for ichthyol paste, ichthyol 20, II 10, and I 70%. Concentrates keep well, lessen wastage, and save transportation costs. Julian F. Smith

PROCESSES AND PROPERTIES INDEX

100 AND 110 CROSSL

117 AND 110 CROSSL

COMMON VARIABLES INDEX

OPEN MATERIALS INDEX

ASM-31A METALLURGICAL LITERATURE CLASSIFICATION

130-054109

111117 ONE ONE 111

100 AND 110 CROSSL

COMMON VARIABLES INDEX

OPEN MATERIALS INDEX

ASM-31A METALLURGICAL LITERATURE CLASSIFICATION

130-054109

111117 ONE ONE 111

WELLSKY, Prof. A. B.

Mem., Clinic Skin Diseases, Central Syphilodermatological Inst., Min. Health, -1947-.
"Penicillin Salve for the Treatment of Some Skin Diseases," Vest. Venerol. i Dermatol.,
No. 5, 1947; "Penicillin Ointment for Treating Skin Diseases," Fol'isher i Akusher.,
No. 1, 1948.

SELISSEKIY. A. B. Prof

FA 41T65

USSR/Medicine - Skin Diseases
Medicine - Penicillin

Jan 1948

"Penicillin Ointment for Treating Skin Diseases,"
Prof A. B. Selisskiy, 3 pp

"Fel'dsher i Akusherka" No 1

Penicillin ointment is very effective in coping with pyococcus infection of the skin. In some instances (furuncles, carbuncles, etc.) treatment required a combined form, i.e., penicillin ointments on the skin surface and penicillin injections.

41T65

PA 18/49T79

SELISKIY, A. B. PROF

USSR/Medicine - Penicillin
Medicine - Ointments

May/June 48

"The Effectiveness of Penicillin Ointments,
Depending on the Base and its Ingredients,"
Prof A. B. Seliskiy, G. Ya. Sherepova, B. M.
Lybedev, 3 pp

"Vest Venerol i Dermatol" No 3

Effectiveness of penicillin in ointments depends
on its base and ingredients. Penicillin in vase-
line ointments has practically no bacteriostatic
effect against staphylococcus aureus (on peptone
agar). Activity of ointments on emulsion bases
is higher. Ointments on anhydrous bases of
18/49T79

USSR/Medicine - Penicillin (Contd) May/June 48

stearin or wax with vaseline or vegetable oil
are effective. Glycerine used as an ointment
component does not affect penicillin.

18/49T79

SELISKII, A. B.

LEBEDEV, B. N., SELISSKII, A. B.

Selebin, a new preparation for treatment of eczema. Vest. vener.
No. 4, July-Aug. 50. p. 41

1. Of the Skin Clinic (Head—Prof. L. N. Mashkilleyson), Central
Skin-Venerological Institute (Director—Candidate Medical Sciences
N. M. Turanov) of the Ministry of Public Health USSR.

GLML 19, 5, Nov., 1950

SELISSKIY, A.B.

[Treating skin diseases and prescribing for them; manual for
physicians] Lechenie zabolevanii kozhi i retseptura; spra-
vochnik dlia vrachei. Minsk, Izd.-vo Akademii nauk BSSR, 1955.
271 p. (MLRA 8:11)

(SKIN--DISEASES)

SELISSKIY, A.B.

Cutaneous nerves in eczema. Arkh.pat. 17 no.1:68 Ja-Mr '55
(ECZEMA, physiology, skin nerves) (MLRA 8:10)
(SKIN, innervation,
in eczema)

SELISSKIY, A.B.

[Skin diseases in children and adolescents] Bolezni kozhi u detei
i podrostkov. Minsk, Izd-vo Akademii nauk BSSR, 1957. 269 p.
(SKIN--DISEASES) (MLRA 10:7)

SELISSKIY, Aleksandr Borisovich

[Manual on skin diseases; clinical aspects and treatment of skin diseases, prescription writing, homeotherapy] Spravochnik po kozhnym bolezniam; klinika i lechenie zabolevanii kozhi, retseptura, gomeoterapiia. Minsk, Gos.izd-vo BSSR, 1959. 410 p.
(SKIN--DISEASES) (MIRA 13:9)

SELISSKIY, A.B.

Dermabrasion; survey of the literature. Vest.derm.i ven. 34
no.10:35-39 '60. (MIRA 13:11)
(SKIN--SURGERY)

SELISSKIY, Aleksandr Borisovich, prof.; PAVLOV, N.F., dots., red.;
ZAYTSEVA, T., red. izd-va; VOLOKHANOVICH, I., tekhn. red.

[A guide to skin diseases; clinical aspects and treatment of
diseases of the skin, pharmacotherapy and prescription fil-
ling] Spravochnik po kozhnym bolezniam; klinika i lechenie za-
bolevanii kozhi, farmakoterapiia i retseptura. Izd.2., perer.
i dop. Minsk, Izd-vo Akad.nauk BSSR, 1961. 412 p.
(MIRA 15:1)

(SKIN—DISEASES)

SELISSKIY, Aleksandr Borisovich, prof.; POTEYENKO, M., red.;
VARENIKOVA, V., tekhn. red.

[Manual on skin diseases; clinical aspects and treatment
of skin diseases, pharmacotherapy and prescription] Spra-
vochnik po kozhnym bolezniam; klinika i lechenie zabolevanii
kozhi, farmakoterapiia i retseptura. Izd.3., perer. i dop.
Minsk, Gosizdat BSSR, 1963. 475 p. (MIRA 17:2)

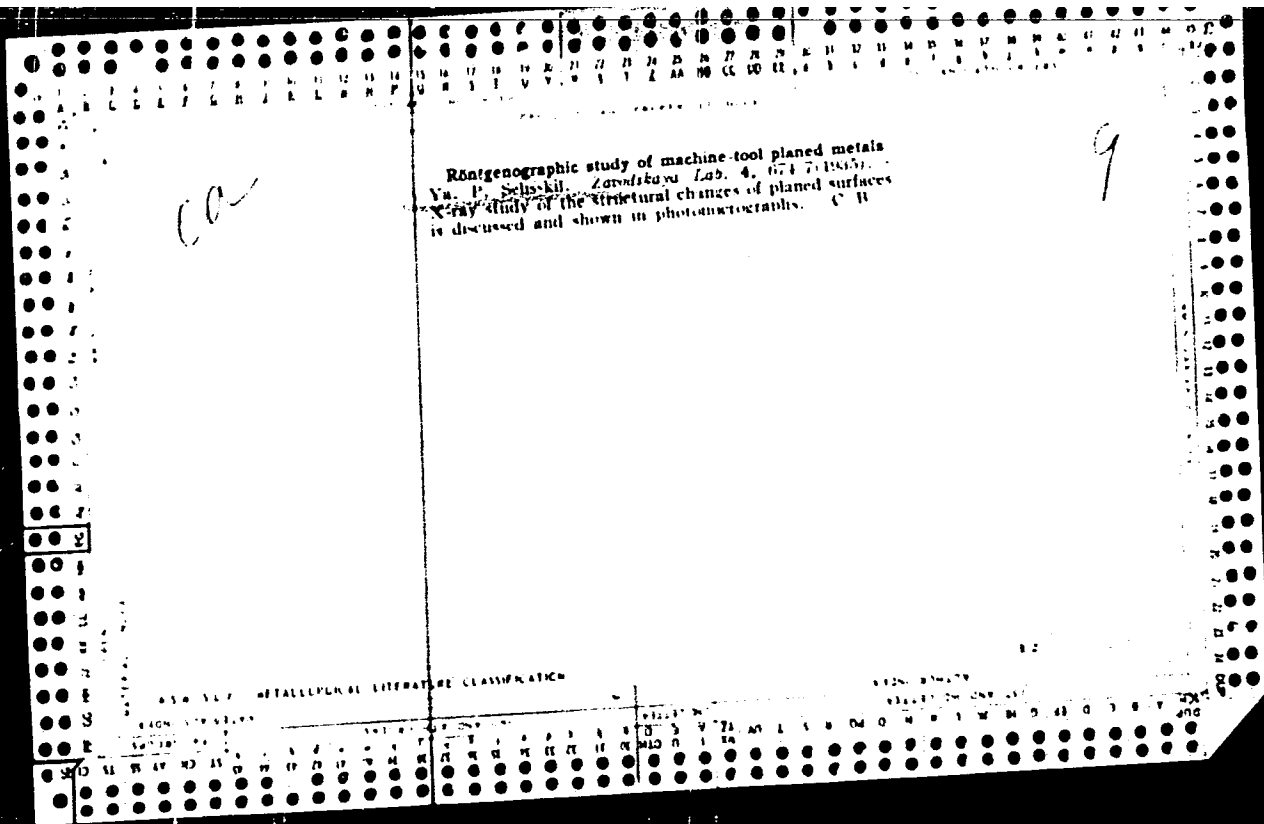
SELISKIY, YA. P.
CU

9

The broadening of the Debye-Scherrer lines on the röntgenograms of metals after cold working and annealing. S. Konochevskit and I. Seliskit. *Physik Z. Sowjetunion* 4, 439-80(1933) — This phenomenon was studied with Cu, Fe, Al, Zn, Mg and the Al-Zn-Mg alloy "Electron AZM." For Mg, the width of the line is an exponential function of the annealing time for temps. below recrystn. For "Electron," a triplet instead of the K_{α} doublet is found for high-order lines; this is explained by diffusion of the Al and Zn atoms in the deformed solid-soln. lattice. It is theoretically shown that, in certain temp. intervals, elastic strains can be relieved through a redistribution of the atoms of the components of the solid soln.

Victor Hicks

A 30-51A METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 3RD AND 4TH ORDERS

BC *2*

Cameras for X-ray analysis by the inverse-ray method. J. P. SZLUSKI (Zavod. Lab., 1936, 5, 779—782). R. T.

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

OPEN
COMMON ELEMENTS
MATERIALS INDEX
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1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

2

***X-Ray Investigation of Work-Hardening Produced in the Machining of Brass.** N. A. Kravchenko, J. P. Selinski, and V. N. Tiukneva (*Zavodskaya Laboratoriya (Works' Lab.)*, 1936, 5, (9), 1085-1094).—[In Russian.] The broadening of X-ray interference lines obtained in back reflection diagrams of brass (50:40 + 1% lead) was studied. The surface of the test-pieces was etched away in steps of 0.04-0.01 mm. using 50% nitric acid. The cutting speed was varied from 4 to 265 m./minute, the advance of the cutting tool from 0.1 to 0.9 mm./rev., and the cutting depth from 0.5 to 2 mm. Cutting was carried out with both sharp and blunt tools. Increase in advance and depth of cut increased the depth of work-hardening. A threefold increase in the advance from 0.26 to 0.72 mm./rev. increased the depth of work-hardening from 115 to 220 μ . A threefold increase in the cutting depth from 1 to 3 mm. increased the depth of work-hardening from 170 to 195 μ . Increase in the cutting speed decreased work-hardening which was also greater with a blunt than with a sharp tool. The curve giving the connection between depth of work-hardening and cutting speed is a straight line up to 200 m./minute, after which it becomes parallel to the speed axis. The decrease in the depth of work-hardening with increase in cutting speed is explained by the increase in temperature of the test-piece when machined at high speeds.—D. N. S.

METALLURGICAL LITERATURE CLASSIFICATION

E-277777-2-2000

GROUP	SUBGROUP	SECTION	SUBSECTION	LETTER	SUBLETTER	CLASSIFICATION	SUBCLASSIFICATION	SUBSUBCLASSIFICATION	SUBSUBSUBCLASSIFICATION
A	B	C	D	E	F	G	H	I	J

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

LIST AND PROPERTIES INDEX

Some peculiarities of the fine structure in chromium ball-bearing steel. Ya. P. Seliskii. *Kachestvennaya Stal* 5, No. 12, 317 (1937); *Chem. Zentr.* 1938, II, 932.

In ball bearing steels contg 1% C and 1.5% Cr local regions of carbide enrichment were detected which prevent the transition of the austenite. The strains so caused result in various flaws in the finished bearing.

M. G. Moore

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

REGIONAL DIVISIONS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 3RD AND 4TH ORDERS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

m /

***Ageing of Duralumin Under High Pressure. J. P. Seliskiy and V. G. Kuznezov (*Metallurg* (*Metallurgist*), 1937, (9/10), 130-132).—(In Russian.) Duralumin quenched from 500° C. (copper 4-47, magnesium 0-78, manganese 0-83, silicon 0-55%, rest aluminium) aged at 100° C. under a pressure of 10,000 kg./cm.² increases in hardness more slowly than it does under atmospheric pressure, because of the impeded motion of the atoms in the lattice. A description of the high pressure apparatus is given.—N. A.**

COMMON SUBJECTS COMMON SUBJECTS INDEX

MATERIALS INDEX MATERIALS INDEX

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION 5-2

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS 5TH AND 6TH ORDERS 7TH AND 8TH ORDERS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

BC *a-1*

Indirect observation of structural changes at high temperatures, using the electron microscope. J. P. SALMARI (Zavod. Lab., 1938, 7, 114-115).—Transformation of α - into γ -Fe, or the reverse change, may be followed with the aid of an electron microscope. R. T.

COMMON ELEMENTS
OPEN MATERIALS INDEX
A 58-51A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PROCESSES AND PROPERTIES INDEX

18

On the Cause of High Permeability of Alloys Fe-Si-Al ("Sensidust"). A. S. Zaimovsky and I. P. Selinsky. (Journal of Physics, U.S.S.R., 1941, vol. 4, No. 6, pp. 563-565). The authors determined the magnetic permeability of ninety iron-silicon-aluminum alloys with compositions in the range silicon 2% to 15% and aluminum 2% to 13% and found that their high permeability was closely related to low magnetostriction and low magnetic anisotropy constants.

75M-51A METALLURGICAL LITERATURE CLASSIFICATION

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

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A18-31A METALLURGICAL LITERATURE CLASSIFICATION

EQUINOX MONTH

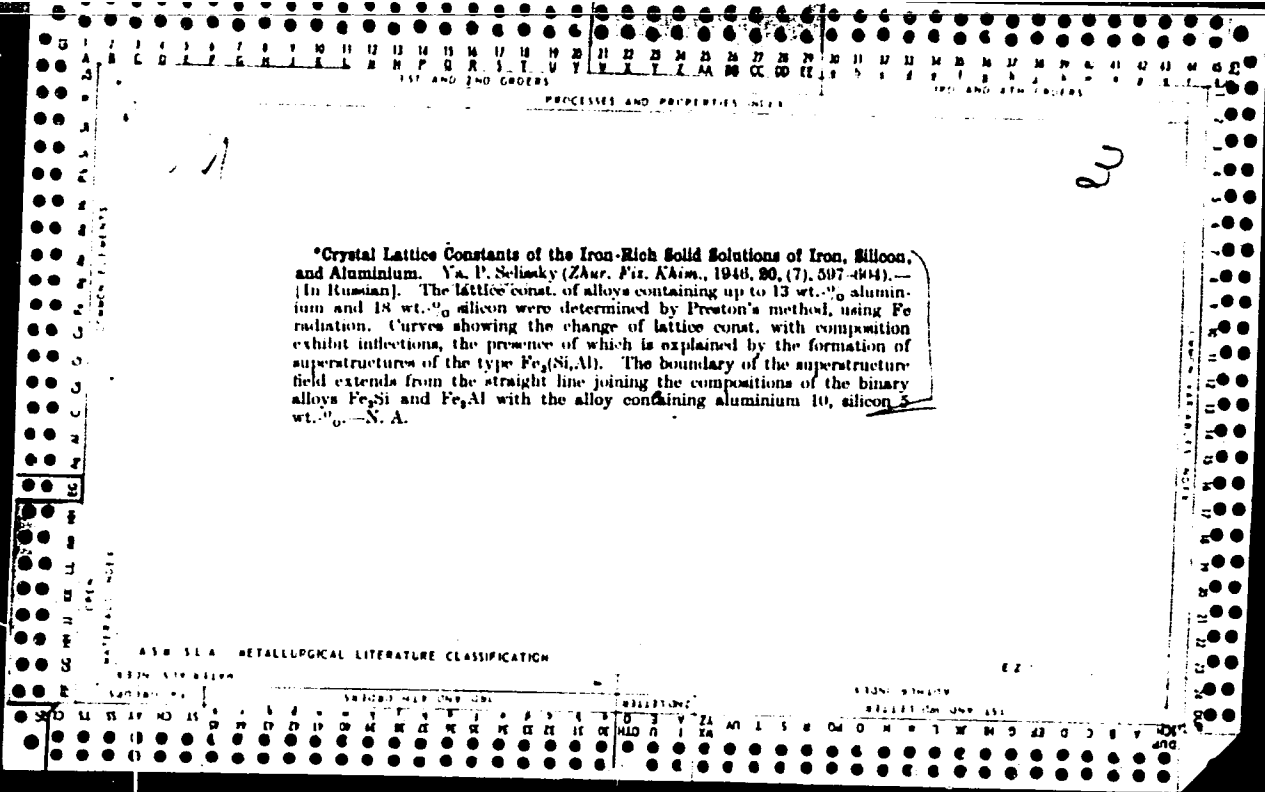
1ST AND 2ND ORDERS

1ST AND 2ND ORDERS

High Permeability and Superstructure in Fe-Si-Al Alloys "Standard" Type. I. P. Selsky. (Journal of Physics, U.S.S.R., 1941, vol. 4, No. 6, pp. 567-568). The author investigated the influence of heat treatment on the magnetic properties of two iron-silicon-aluminium alloys (aluminium 5.03% and 5.43%, silicon 9.8% and 9.38% respectively). These alloys probably contain superstructures of the type $Fe_3(Al, Si)$. Rapid cooling caused a partial disorder which promoted an increase in the magnetic permeability.

SELISSKIY, Ya. P.

"Magnetic Materials in the Technics of Communications," Nauchno-Tekhnicheskiy
Bulleted', MIISSV, 7, 1, 1946



*Crystal Lattice Constants of the Iron-Rich Solid Solutions of Iron, Silicon, and Aluminium. Ya. P. Selitsky (Zhur. Fiz. Khim., 1948, 20, (7), 507-504). — [In Russian]. The lattice const. of alloys containing up to 13 wt.-% aluminium and 18 wt.-% silicon were determined by Preston's method, using Fe radiation. Curves showing the change of lattice const. with composition exhibit inflections, the presence of which is explained by the formation of superstructures of the type Fe₃(Si,Al). The boundary of the superstructure field extends from the straight line joining the compositions of the binary alloys Fe₃Si and Fe₃Al with the alloy containing aluminium 10, silicon 5 wt.-%.—N. A.

3/8 9

Stabilizing the structure of hardened bearing steel
Ya. P. Seliskil and A. S. Shelin. *Voprosy Mashinostroyeniya* 27, No. 2, 31-8 (1947).—It was observed that bearing races expanded their dimensions before and even after they were assembled into bearings. The expansion was irregular as to direction. The cause of expansion was traced to the thermal treatment of the steel, particularly to treatment which caused an increase of residual austenite after hardening and tempering. Extensive expts. on the cooling cycle showed that intensification of cooling in the hardening process lowers the residual austenite content and stabilizes the structure of the steel and the dimensions of the work piece. However, lowering the temp. of the cooling medium to intensify the cooling increased the rate of cooling particularly in the region below the beginning of martensitic transformation and caused surface cracking. Slowing down the rate of cooling in the region of the martensite point produced the desired results and prevented cracking. Thus, specimens kept for 10 min. at 80° and then cooled to 20° expanded only 3 μ. Similar results were obtained by keeping at 80° for 2-6 hrs. M. Hosen

PROCESSES AND PROPERTIES INDEX

18

MAGNETIC PERMEABILITY OF CERTAIN MATERIALS WITH WEAK AUDIO AND SUPERSONIC FREQUENCY FIELDS. Y. P. Selisaki and G. A. Matvcev. (Elektrichestvo, 1948, Sept., pp. 60-62 (in Russian); Electrical Engineering Abstracts, 1949, vol. 52, Sept., p. 348). Graphs showing variation in permeability are given for various standard hot and cold rolled transformer steels up to 14 kcs. The relation is also given between effective permeability and frequency for varying strip thickness of strip-wound toroidal cores. Figures are given for 78% and 4% nickel Permalloy. The figures given for initial permeability enable the approximate values of magnetic properties to be calculated at higher field intensities by methods outlined in a previous paper (Elektrichestvo, 1948, Feb., p. 38). The data enable the correct material and strip thickness to be chosen for particular applications.

ASB-35A METALLURGICAL LITERATURE CLASSIFICATION

SELISSKIY, YA. P.

PA 20/49T23

USSR/Electricity
Transformers - Cores
Coils, Choke

Dec. 48

"Materials and Some Features of Belt Transformer
Cores," Ya. P. Selisskiy, Cand Tech Sci, Sci Res
Testing Inst for Communications of the Armed Forces
imeni Voroshilov, 3 pp

"Elektrichestvo" No 12

Recent increases in demands for high-frequency trans-
formers and choke coils have led to use of new
materials for manufacture of cores and use of belt
cores. Shows properties of materials and features
of these cores.

20/49T23

SELISSKIY, Ya. P.
Ya. P. Selisskii and A. S. Shein, Stabilization of Structure of Quenched Bearing Steel
VESTNIK MASHINOSTROENIYA, Vol. 27, 1949, No. 2, pp. 33-38; 2600 words.

SELISSKIY, Ya. P.

USSR •

Roentgen-structural investigation of powder compositions of system nickel-iron, obtained by the carbonyl method. Ya. P. Selisskii, V. D. Krylov, and V. L. Volkov. *Zhur. Tekh. Fiz.* 22, 1728-9(1952).—Powder binary compns. of the system Ni-Fe in the interval of 30-84 atom % Ni, obtained by simultaneous decompn. of carbonyls of Fe and Ni, have a cubic face-centered lattice and do not differ in structure from γ -phase binary alloys of Ni-Fe obtained by usual means. Change of lattice spacing in relation to chem. compn. is the same. Immediately after the carbonyl process a powder is obtained which is chemically heterogeneous between particles but roentgeno-structural differences are not apparent. The internal heterogeneity disappears on annealing at 1000°. V. N. Bednarski

RUMYANTSEV, S.V.; GRIGOROVICH, Yu.A.; SELISSKIY, Ya.P., redaktor;
VAYNSHTEYN, Ya.B., tekhnicheskiiy redaktor.

[Quality control of metals through the use of gamma rays]
Kontrol' kachestva metallov gamma-luchami. Moskva, Gos.
nauchno-tekhn. izd-vo literatury po chernoi i tsvetnoi me-
tallurgii, 1954. 248 p. (MIRA 7:8)
(Metals--Analysis) (Gamma rays)

HUME-ROTHERY, William; LYUBOV, B.Ya., redaktor [translator]; SELISSKIY,
Ya.P., redaktor [translator].

[Atomic theory for students of metallurgy. Translated from the
English] Atomnaya teoriya dlia metallurgov. Perevod s angliiskogo
i redaktsiia B.IA.Liubova i IA.P.Selisskogo. Moskva, Gos.nauchno-
tekhn.izd-vo lit-ry po cherno i tsvetnoi metallurgii, 1955. 332 p.
(MLBA 9:4)

(Atomic theory) (Electrons) (Metals)

HUME-ROTHERY, W.; CHRISTIAN, I.W.; PEARSON, W.B.; KADYKOVA, G.N. [translator];
KRASNOPEVTSEVA, T.V. [translator]; RAVDEL', M.P. [translator];
~~SRISSKIY, Ya. P.~~, redaktor; GOL'DENBERG, A.A., redaktor; ARKHANGEL'-
SKAYA, M.S., redaktor izdatel'stva; EVENSON, I.M., tekhnicheskiy
redaktor

[Metallurgical equilibrium diagrams. Translated from the English]
Diagrammy ravnovesiia metallicheskih sistem. Perevod s angliiskogo
B.N.Kadykovo i dr. Pod red. IA.P.Selisskogo. Moskva, Gos. nauchno-
tekhn. izd-vo lit-ry po cherno i tsvetnoi metallurgii, 1956. 399 p.
(Phase rule and equilibrium) (MIRA 10:4)
(Alloys) (Solutions, Solid)

SELISSKIY, YA. P.

G-4

USSR/Electricity - Conductors

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12239

Author : Gutovskiy, I.G., Selisskiy, Ya.P.

Inst : -

Title : Anomaly of Electric Resistance in the Fe₃Si Alloy.

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 2, 375-376

Abstract : Measurement was made of the electric resistivity (R) of an alloy Fe₃Si at high temperatures (T) to determine the temperature region of the disordering of this alloy. As the critical temperature of ordering was approached, there should have appeared, in connection with the reduced degree of order, an additional resistance with a break on the R vs. T curve at the critical point. Measurements have shown a strictly linear course of the R vs. T curve up to 600°, where a sharp break in the curve was observed and a subsequent slight reduction in the electric resistivity as the temperature was increased to

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001547720011-3

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Abs Jour : Ref Zhur - Fizika, No 5, 1957, 12239

1100°. The linear course of the R vs. T curve in the region from 20 to 600° indicates that in this region there is no disordering process, and this indeed explains the absence of an additional increase in R above that due to the scattering of conduction electrons by the thermal vibrations of the lattice.

Card 2/2

SECRET
KADYKOVA, G.N.; SELISSKIY, Ya.P.

Ordering process in iron-cobalt alloys. Fiz.met. i metalloved. 3
no.3:486-496 '56. (MIRA 10:3)

1. Institut pretsizionnykh splavov Tsentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Iron-cobalt alloys--Metallography)

SELISSKIY, Ya.P.

KADYKOVA, G.N.; SELISSKIY, Ya.P.

Ordering rate in FeCo alloys. Fiz.met. i metalloved. 3 no.3:497-
502 '56. (MIRA 10:3)

1. Institut pretsizionnykh splavov Tsentral'nogo nauchno-issledovatel'
skogo instituta chernoy metallurgii.
(Iron-cobalt alloys--Metallography)

SELISSKIY, YA.P.

ARTSISHEVSKIY, M.A. [translator]; SELISSKIY, Ya.P., red.; GRYAZNOV, I.M.,
red.; ARKHANGEL'SKAYA, M.S., red. izdatel'stva; KARASEV, A.I., tekhn.red.

[Effect of nuclear irradiation on structure and properties of metals
and alloys. Translations.] Deistvie iadernykh izluchenii na
strukturu i svoistva metallov i splavov. Perevod M.A.Artsishevskogo,
pod red.IA.P.Selisskogo. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry
po chernoi i tsvetnoi metallurgii, 1957. 171 p. (MIRA 11:1)
(Nuclear reactors--Materials)

134

AUTHOR: Belisskiy, Ya.P.
TITLE: On the process of ordering in Fe₃Al alloys.
(O protsesse yaporyadocheniya v splase Fe₃Al.)
PERIODICAL: "Fizika Metallov i Metallovedenie" (Physics of Metals and Metallurgy), 1957, Vol.IV, No.1 (10), pp.191-192, (U.S.S.R.)
ABSTRACT: The process of ordering in the alloy Fe₃Al was investigated by measuring the volume changes caused by the formation or the breaking up of a super-structure, and on the basis of thermo-magnetic curves. The volume effects were investigated dilatometrically and by X-rays (measurement of the period of the lattice of powders hardened from various temperatures after step-wise annealing by means of a Preston chamber). On heating specimens hardened from 700 and 850 °C an appreciable reduction in volume occurs due to ordering from 180 °C onwards; it is most pronounced between 260 and 285 °C and changes sign at higher temperatures due to the beginning of disordering. The Curie point was measured at 610 °C and at that temperature the dilatometric curves show a bend. 1 graph, 1 Russian and 3 English references.
Ferrous Metallurgy Research Institute. Recd.Oct.1, 1956.

SSR ISSA-11.11.11

RAVDEL', M.P.; SELISSKIY, Ya.P.

Transformations in ternary Ni₃Fe-base solid solutions. Dokl.
AN SSSR 115 no.2:319-321 Л '57. (MIRA 10:12)

1. Institut pretsizionnykh splavov Tsentral'nogo nauchno-issledovatel'-
skogo instituta chernoy metallurgii. Predstavleno Akademikom I.P.
Bardinyam.

(Iron-nickel alloys)

SELISSKIY YA.P.

20-2-34/62

AUTHOR
TITLE

RAVDEL, M.P. and Selisskiy, Ya.P.
Transformations in Ternary solid Solutions with Ni₃Mo
as Primer.
(Prevrashcheniya v troynnykh tverdykh rastvorakh na
osnove Ni₃Fe.- Russian)
Doklady Akademii Nauk SSSR 1957, Vol 115 Nr 5,
pp 319-321 (U.S.S.R.)

PERIODICAL

ABSTRACT

In the first four papers quoted the special influence by molybdenum on the arranging alloys of a composition close to Ni₃Fe was emphasized. It was found that alloying with molybdenum fundamentally changes the transformation character in the annealing of these alloys. This shows in an anomaly of electric resistance and in effects of volume deviating from the arrangement. In the present paper the influence of various elements - Mn, Si, Cu, Mo, V, and W - on the process of arrangement of the Ni₃Fe alloy was investigated. Ill. 1 shows the change of the Velectroresistance of alloys with various alloying additions as dependent on the quenching temperature in the course of gradual cooling. The initial state of all alloys was obtained after quenching from 900°C in water. The duration was varied from 24 to 120 hours according to the quenching temperature.

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20-2-34/62

Transformations in Ternary Solid Solutions with Ni_3Fe
as Primer.

Alloying with 3 % Mn considerably intensifies the effect of arrangement in non-alloyed Ni_3Fe and markedly raises the temperature of the transformation "order-disorder". Alloying with 5% Cu reduces this effect. It acts in the same way as the deviation from the stoichiometric composition in a binary alloy Fe-Ni (e.g. 79 % Ni). In the alloys with 45 % Cr, 4 % V and 4 % W an abnormal increase in electric resistance develops after a long-lasting gradual heat-treatment (6,5 % in Cr, 12 % in Mo, 20 % in Va). In the W-alloy it is comparatively small (2,5 %). In the Si-alloy it is 3 %. This alloy also shows the same anomaly. The curve here has a maximum at 450°C. Above that the resistance in Si increases more intensively than in other elements. Ill. 2 records the curves of change of the coefficient of thermal expansions α as dependent on temperature. The initial state was reached in like manner as above, but between 250 and 550°C. Ill. 3 gives the thermomagnetic curves characteristic for alloys with only one element which latter exhibits an anomaly of electroresistance. Ill. 4 gives a comparison of the same curves of the arranging alloys Ni_3Fe and $Ni_3(Fe,Mn)$.

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20-2-34/62

Transformations in Ternary Solid Solutions with Ni_3Fe
as Primer.

The thermomagnetic curves of the alloys which show the anomaly of resistance and the abnormal course of the coefficient of thermal expansion, are similar and characterized by an indistinct magnetic transformation on heating and cooling. The latter may be explained by the local chemical heterogeneity of the solid solution. Chemical complexes distinguished by a higher Curie point apparently form around the atoms of admixture at a certain temperature due to their chemical relationship with the atoms of the chief components. The more the alloying element differs from the chief elements the stronger is the chemical relationship and the stabler the developing complexes. The peculiar influence of Mn is apparently connected with the fact that, in a solid solution which possesses an incompletely built 3d-shell, Mn participates in the magnetic interaction. In an orderly arrangement the magnetic saturation of the $Ni_3(Fe, Mn)$ -alloy is much higher than in Ni_3Fe , whereas

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20-2-34/62

Transformations in Ternary Solid Solutions with Ni_3Fe as Primer.

Mn after hardening reduces the magnetic saturation of Ni_3Fe just as the other elements. An additional reduction of the electric resistance in annealing is therefore connected with the increase of magnetic saturation in the arrangement of the $Ni_3(Va, Mn)$ -alloy.

(4 Illustrations, 2 Slides references)

ASSOCIATION:

Institute of Precision Alloys of the Central Scientific Research Institute of Heavy Metallurgy.
(Institut presizionnykh splavov i central'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii)

PRESENTED BY:

Bardin, I.P., Academician, March 13, 1957

SUBMITTED:

12.3. 57

AVAILABLE:

Library of Congress.

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SELISSKIY Ya. P.

SOV-3-58-9-25/36

reports of an Inter-vuz Conference on
Relaxation Phenomena in Pure Metals and Alloys

2-4 Apr 1958, Moscow Inst. of Steels.
Institute)

covered the resilient reaction of spring alloys,
various physical and technological effects on it and the
methods of its measurement. Ya. P. Selisskiy (Institute of
Precision Alloys TsNIICHM) told of subsiding oscillations
of ultrasonic frequency in some ferromagnetic solid solutions.
R.I. Garber and A.I. Kovalev (Physico-Technical Institute
UkrSSR AS in Khar'kov) spoke of the temperature dependency
of moduli of elasticity of iron.

Vest. Vysshe Shkoly, 9, 72-3, 1958
(Piguzov, Yu. V.)

~~Card 4/4.~~

SELISSKIY YA.P.

SOV/126-7-1-7/28
Koshelyayev, O.V.

AUTHORS: Artishavskiy, M.A., Vasil'yev, G.S.,
and Selisskiy, Ya.P.

TITLE: The Effect of Deuteron-Bombardment on Electrical Resistance
of the Ordering Alloy Ni₃Fe, Fe₃Al and the Aging Alloy
Fe-Ni-Ti (Deystviye bombardirovki deytronami na elektro-
soprotivleniye uporyadchivayushchikhsya splavov Ni₃Fe,
Fe₃Al i staruyushchego splava Fe-Ni-Ti)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1989, Vol. 7, Nr 1,
pp 53-56 (USSR)

ABSTRACT: The authors studied the effect of irradiation with 4 MeV
deuterons on electrical resistance of the ordering alloy
Ni₃Fe, Fe₃Al and the aging alloy Fe-Ni-Ti, thickness which
samples were of 20-50 μ. The lattice atoms
changed interaction of deuterium with the lattice atoms
throughout the whole sample. Before measurement, samples
were subjected to various forms of heat treatment. The
ordered state of the Ni₃Fe alloy was obtained by slow
ordered state for a fortnight from 550°C. The Fe₃Al alloy was

Card 1/4 cooling for a fortnight from 550°C. The Fe₃Al alloy was

ordered by cooling at the rate of 250°C/hour from 550-250°C.
The disordered state of the Ni₃Fe, Fe₃Al alloys were pro-
duced by quenching from 850°C. Aged and cold-deformed samples at
was achieved by four-hour heating of cold-deformed samples at
700°C. The latter alloy was also heated after quenching from
1000°C. For irradiation the samples were placed in a cassette
cooled by running water, and the temperature of the sample during
irradiation did not rise above 40°C. Electrical resistance
was measured by means of a potentiometer before and after
irradiation. The results are shown in Tables 1-3. Irradiation
increased, in general, the electrical resistance of the quenched
annealed (ordered) Fe₃Al and decreased that of the aged and
Fe₃Al. The electrical resistance of Ni₃Fe fell with increase of the
the annealed (ordered) Ni₃Fe. Low intensities of irradiation,
up to 5 x 10¹⁸ deuterons/cm², decreased the electrical
resistance of both Fe₃Al and Ni₃Fe. In the case of the

Card 2/4 Fe-Ni-Ti alloy the changes on irradiation were hardly

larger than the experimental error, but their sign was
positive in quenched samples and negative in aged samples.
The authors conclude that deuteron bombardment produces
further ordering of the Ni₃Fe alloy. In the Fe₃Al alloy
deuteron irradiation produces a state intermediate between
the disordered and ordered states. After irradiation the
samples were subjected to tempering at various temperatures.
In the case of Fe₃Al the shape of the electrical resistance
curves (Fig.1) of irradiated samples after deuteron irradiation does
tempered at 250°C, confirmed the state of ordering. When
in fact produce an intermediate state of ordering. When
the irradiated Ni₃Fe samples were tempered the durations
of tempering were insufficient to reach a state of equilibrium
(Fig.2). No noticeable difference was observed between the
behaviour of irradiated and the non-irradiated Fe-Ni-Ti
samples after tempering. There are 2 figures, 5 tables and
Card 3/4 4 English references.

ASSOCIATION: Institut pretsionnykh splavov Tselikhin (Institute of
Precision Alloys Tselikhin); 2-y nauchno-issledovatel'skiy
fiziicheskiy in-tit MUU (Second Scientific-Research Physics
Institute, Moscow State University).

SUBMITTED: May 27, 1987

SOV/126-7-2-9/39

24(2), 18(3), 18(7)

AUTHORS: Borodkina, M. M., Detlaf, Ye. I. and Selisskiy, Ya.P.

TITLE: Recovery and Recrystallisation in the Ordering Alloys Fe-Co (Vozvrat i rekristallizatsiya v uporyadochivayushchikhsya splavakh Fe-Co)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 2, pp 214-224 + 1 plate (USSR)

ABSTRACT: The results of an investigation carried out with the aim of elucidating the characteristics of recovery of the initial stage of recrystallisation of Fe-Co alloys in relation to cobalt content are described in this paper. Alloys, the compositions of which are shown in Table 1, were cast from Armco iron and cobalt K-1 into ingots weighing 1 kg. These were forged at 1180°C into billets and subsequently rolled at 1100 to 1150°C into strip of 3 mm thickness. The hot rolled strip was cut into squares which were water quenched from 900°C and cold rolled to thicknesses of 0.5 and 0.1 mm. Square specimens 20 x 20 mm were cut from the cold rolled strip. These were sealed in evacuated quartz ampules and annealed at temperatures of: 150, 300, 400, 450, 500, 550, 600, 700 and 750°C,

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Recovery and Recrystallisation in the Ordering Alloys Fe-Co

at which they were soaked for 5, 10 and 15 mins, 1 and 2 hours. In special cases the soaking time was 8 hours. Cooling was carried out in air. Specimens of 0.5 mm thickness were used for hardness tests on a Vickers machine using a load of 5 kg and for an X-ray investigation in a RKE camera for rapid exposure (Ref 2) and in a KROS camera. Exposure in this case was carried out in a Co irradiation, both the adaptor and the specimen were rotated. The distances between the object and the film was 100 mm. In the X-ray photographs the K_{α} -doublet lines from the plane (013) were visible which in the case of deformed specimens appeared diffuse and merged into the background of the X-ray picture. An increase in Co content of Fe-Co alloys above 25% is associated with a decrease in lattice parameter (Ref 3), as a result of which the doublet of (013) shifts in the direction of large Bragg angles - for a 25% Co alloy $\theta = 81^{\circ}$, for a 75% Co alloy $\theta = 86^{\circ}$. For this reason the sensitivity of the method to change in line width was great and increased with increasing Co content. In order to estimate the

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Recovery and Recrystallisation in the Ordering Alloys Fe-Co

changes in width and intensity of the doublet line during annealing, the X-ray films were photometered in the micro-photometer MF-4. The beginning of recrystallisation was indicated by the appearance of separate interference spots in the doublet line on exposure to the KROS camera with a rigid specimen and adaptor. Besides, specimens of 0.1 mm thickness were investigated in a Mo irradiation in a camera with a flat adaptor in order to obtain textural X-ray pictures at an object-film distance of 60 mm. Here the interference rings of the (011), (002) and (112) planes were clearly apparent, from which the nature of the texture obtained could be established and the progress of recrystallisation could be seen. In Fig 1 the annealing temperature and minimum soaking time required for the appearance of the maxima $K_{\alpha 1}$ and $K_{\alpha 2}$ in the photometric curve is shown in relation to the Co content of the alloy. Fig 2 shows micro-photometric curves for alloys with different Co content which have been annealed at 400°C for 30 mins. Figs 3 and 4 show micro-photometric curves for 65% Co and

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Recovery and Recrystallisation in the Ordering Alloys Fe-Co

35% Co alloys respectively which had been annealed at various temperatures and for various soaking times. Fig 5 shows micro-photometric curves for a 42% Co alloy which had been annealed at various temperatures for 2 hours. Fig 6 shows the temperature ranges of recovery and recrystallisation of alloys with differing Co contents: I - $K_{\alpha 1}$ and $K_{\alpha 2}$ maxima; II - sharp $K_{\alpha 1}$ and $K_{\alpha 2}$ maxima; III-appearance of separate interference spots in the ring; IV - complete disappearance of the continuity of the ring. The region of supplementary diffuseness of the interference lines is indicated by brackets. On the basis of their experiments, the authors arrived at the following conclusions:

1) A relationship between the temperature range of recovery and the composition of the Fe-Co alloys investigated has been established. The beginning of the breaking up of the K_{α} doublet in X-ray photographs, characterising the initial stage of recovery, is observed at very low temperatures in alloys of the stoichiometric compositions Fe_3Co , $FeCo$ and $FeCo_3$. This

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Recovery and Recrystallisation in the Ordering Alloys Fe-Co
is due to the fact that in a number of solid solutions,
the ordering alloys after deformation are thermo-

dynamically least stable.

2) All cold deformed Fe-Co alloys containing between 25 and 75% Co can harden on low temperature annealing. The hardening takes place at annealing temperatures which are not high enough to give a broken up doublet. This hardness is due to ordering in the non-uniformly stressed lattice and formation of mixed regions of a different degree of ordering. In spite of some increase in stress in the distortion of the lattice at various intervals of the ordering process which brings about hardening, the process on the whole must lead to a decrease in free energy.

3) In alloys containing 35 and 42% Co the repeated diffuseness of the doublet coincides in temperature with a retardation in the fall of hardness after attaining a maximum in hardness-annealing temperature curves (35% Co) or even with the appearance of a second maximum (42% Co). The effect described takes place in the transformation range which was found by Masumoto,

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SOV/126-7-2-9/39

Recovery and Recrystallisation in the Ordering Alloys Fe-Co

Saito and Shinozaki (Ref 4) by means of thermal capacity measurements.

4) Recrystallisation in the ordering Fe-Co alloys commences at order-disorder transformation temperatures. Recrystallisation commences at the highest temperature in an alloy of the stoichiometric composition FeCo. There are 9 figures, 2 tables and 6 references, 2 of which are Soviet, 4 English.

ASSOCIATION: Institut pretsizionnykh splavov TsNIICHM
(Institute of Precision Alloys TsNIICHM)

SUBMITTED: May 14, 1957

Card 6/6

SOV/126-7-4-7/26

AUTHOR: Selisskiy, Ya.P.

TITLE: On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 4, pp 534-543 (USSR)

ABSTRACT: It has been proved by Rhines et al (Ref 1 and 2) that the order \rightleftharpoons disorder transformations in alloys whose composition is given by the formulae Cu₃Au and CuAu are, in fact, classical phase transformations, i.e. first-order phase changes. These findings, however, do not necessarily apply to all alloys in which the order \rightleftharpoons disorder transformation occur and the object of the investigation described in the present paper was to determine the character of the transformation taking place in the Fe₃Al alloy. X-ray and dilatometric measurements were used for this purpose, the experimental alloy containing (in weight %) 13.2 Al, 0.07 Mn, 0.11 Si, 0.025 C, the remainder Fe. The dilatometer specimens (50 mm long, 3 mm diameter) were machined from 8 mm diameter rods obtained by hot forging the cast ingots and annealed (in hydrogen) at 1100°C for 3 hours.

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SOV/126-7-4-7/26

On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

The same rods were used for the preparation of filings used for the X-ray analysis. (The particle size of the filings used in the experiments did not exceed $5 \cdot 10^{-3}$ mm.) Heat treatment of the X-ray specimens was carried out in a vacuum quenching furnace shown schematically in Fig 1. The filings were contained in a small quartz boat (1) which was suspended inside a quartz tube (2) on nichrome wires (3) attached to a permalloy, arc-shaped anchor (4). On the completion of the heat treatment, the permalloy anchor (4) was lifted from its holder (5) with the aid of a magnet, and the quartz boat with the filings was dropped into the quenching tank (6). Oil D-2 (used generally in diffusion pumps and characterized by low vapour pressure) was used as the quenching medium. No sintering of the iron-aluminium filings heat treated in vacuum of $5 \cdot 10^{-4}$ mm Hg occurred at the highest temperature employed (850°C). On falling into the quenching oil, the filings formed a suspension; this ensured that all particles were cooled at sufficiently fast and uniform rates. In the first series of experiments all X-ray specimens were heated to

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700°C, held at this temperature for 1 hour and then heated or cooled to the quenching temperature. The heat treating cycles are listed in column 1 of Table 1; the numbers following the temperatures denote the holding time (in hours, except the first cycle where the holding time at 800°C was 20 min) at the temperature; the last temperature in each cycle is that from which the X-ray specimen was quenched. The second column gives the values of the lattice parameter, a , of the corresponding specimens. The symbols $I(111)_\alpha$ and $I(220)_\beta$ in the expression the values of which are listed in column 3, denote the intensities of lines $(111)_\alpha$ of the superstructure of the Fe₃Al alloy and lines $(220)_\beta$ of the normal crystal lattice. The values of S listed in the last column of Table 1 were calculated from the data listed in column 3 using the formula at the bottom of p 537; these values give the relative measure of the degree of the long-range order at various temperatures. The temperature dependence of the lattice parameter of Fe₃Al (plotted from the data in Table 1) is shown

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graphically in Fig 2a. The rate at which the lattice parameter attains the equilibrium value is characterized by data given in Table 2. The heat treating cycles are given in column 1: all specimens were heated to 750°C and held at this temperature for 2 hours; the first 4 specimens were then cooled in 10 min to 410°C and quenched immediately or after 1, 4 and 7.5 hours' holding at this temperature; the last 4 specimens were cooled in 15 min to 350°C and then quenched immediately or after 1, 2.5 and 3 hours at this temperature. In the next stage of the investigation the order-disorder transformation was studied by means of dilatometric measurements, in which two series of specimens were used. All the specimens in the first series were subjected to the same preliminary heat treatment which consisted of 2 hours at 750°C followed by 30 min at 800°C and quenching in water. The dilatometric measurements were taken during both the heating and cooling cycles, the rate of heating being 300°C per hour; for the cooling cycle the dilatometer heater was switched off. The typical

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results of these measurements are reproduced in Fig 2b in the form of differential dilatometer curves showing the difference (in mm) between the expansion or contraction of the investigated specimen and that of a standard specimen in which no solid state transformation took place. From the data reproduced in Fig 2b the temperature dependence of the coefficients of thermal expansion was plotted ($10^{-6}/^{\circ}\text{C}$ versus $^{\circ}\text{C}$) for both the investigated and standard specimen (Fig 2v, curves 1 and 2 respectively). The dilatometer specimens of the second series were all quenched from different temperatures, having been first heated to 700°C and held at this temperature for 2 hours; while being cooled to its quenching temperature, each specimen was subjected to one or more (depending on the quenching temperature) isothermal treatments (each of 2 hours duration) at the following temperatures: 550, 500, 450, 350, 300 and 250°C . During the dilatometric measurements these specimens were heated at a rate of $200^{\circ}\text{C}/\text{h}$; on cooling, the specimens were held for one hour at each of the following

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On the Evidence of the Transformation in the Fe Al₃ Alloy being a Second-Order Phase Change

temperatures: 700, 550, 500, 450, 400, 350, 300 and 250°C; the rate of cooling between each of these temperatures was not faster than 5°C/min. The dilatometer curves of the specimens of the second series, quenched at 700, 550, 500, 450, 400, 350, 300 and 250°C are shown in Fig 3a, b, v, g, d, e, zh and z respectively. It was observed in the course of these experiments that on cooling, when the specimens were held at constant temperatures, the dilatometer reading was also constant which indicated that the volume changes occurring in the specimens due to the disorder-order transformation took place rapidly and that the state of equilibrium was already attained at the beginning of each isothermal treatment. The dilatometer curves of the specimen quenched from 700°C (Fig 3a) are similar to those shown in Fig 2b. Regarding the curves of other specimens, quenched from progressively lower temperatures, it will be seen that the lower the quenching temperature, the less pronounced is the minimum on the heating part of the dilatometer curve;

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On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

this is associated with the fact that the lower the quenching temperature, the higher was the degree of the long range order in a given specimen at the beginning of the experiment. This effect is shown also by the variation of the coefficients of thermal expansion calculated from the heating parts of the dilatometer curves in Fig 3, for three temperatures - 250, 275 and 300°C; the relationship between the expansion coefficients and the quenching temperature is shown in Fig 4. It will be seen that while the expansion coefficient of specimens quenched from 700°C is quite small (becoming negative at 275°C as a result of the large volume change due to ordering), it becomes larger as the quenching temperature decreases; specimens quenched from 250 to 400°C have the expansion coefficients practically the same at the three selected temperatures. The various temperatures indicated in Fig 2 and 3 are given the following interpretation: $T_1 = 180^\circ\text{C}$ is the beginning of the non-linear expansion of the (quenched i.e. disordered) alloy on heating and of the decrease of

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On the Evidence of the Transformation in the Fe₃Al Alloy being a
Second-Order Phase Change

the expansion coefficient; $T_2 = 260^\circ\text{C}$ marks the beginning of rapid contraction of the alloy on heating and the change of the sign of the expansion coefficient from positive to negative; $T_{PH} = 270^\circ\text{C}$ is the temperature at which the order-disorder transformation begins in the heated alloy; $T_3 = 280^\circ\text{C}$ marks the end of rapid contraction of the heated alloy and the change of the sign of the expansion coefficient from negative to positive; $T_4 = 370^\circ\text{C}$ is the temperature at which both the standard and the investigated specimens have the same thermal expansion coefficients; $T_{KN1} = 545^\circ\text{C}$ marks a deflection on the heating portion of the dilometer curve, a sharp maximum on the graph of the temperature dependence of the expansion coefficient and disappearance of the long range order; $T_c = 610$ to 615°C marks the magnetic transformation; T_{K01} - deflection point on the cooling portion of the dilatometer curve whose position depends on the rate of cooling and which indicates the appearance of the long range order; $T_{yo} = 300^\circ\text{C}$ marks the beginning of the linear contraction

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On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

of the alloy during cooling. Thus, when the Fe₃Al alloy in which the disordered structure has been retained by quenching is heated, the disorder-order transformation begins at a comparatively low temperature ($T_1 = 180^\circ\text{C}$) and takes place within a comparatively narrow temperature range ($180\text{-}270^\circ\text{C}$) while the order-disorder change occurs (on heating) within a wider temperature range ($270\text{-}545^\circ\text{C}$). The disorder-order transformation in a specimen cooled from high temperature occurs between 545 and 300°C . The values of the lattice parameter (a) measured in the $550\text{-}250^\circ\text{C}$ temperature interval (see Table 1) were used for the determination of the value of relative compression, $\delta a/\Delta a$, brought about by the disorder-order transformation. (Δa is the total reduction of the lattice parameter of alloy cooled slowly between 550 and 250°C ; δa is the reduction of the lattice parameter cooled slowly from 550°C to a given quenching temperature) The relationship between $\delta a/\Delta a$ and T/T_k (where T is the absolute quenching temperature and T_k corresponds to absolute T_{KN1}) is shown in Fig 5, both for the Fe₃Al alloy (curve 1) and for the Cu₃Au

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On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

alloy (curve 3). Curve 2 in Fig 5 represents the variation of S (the magnitude of which is proportional to the degree of the long range order) with T/T_K. It will be seen that while there is a sudden change of volume of the Cu₃Au alloy at the Kurnakov point (T_K), this being one of the characteristics of a first-order phase change, the volume of the Fe₃Al alloy changes monotonically. The divergence between the S and $\delta a/\Delta a$ curves for the Fe₃Al alloy is attributed to the fact that, according to Owen and MacArthur (Ref 6), the volume changes are associated with the initial stages of the disorder-order transformation and take place in a short time interval, while the variation of the intensity of the superlattice lines is associated with the growth of the anti-phase domains which is a slower process. It is stated in the concluding remarks that the absence of any discontinuities in the variation of the studied properties of the Fe₃Al alloy during the disorder-order transformation, taken in conjunction with other published data, is a convincing proof that this transformation is a

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SOV/126-7-4-7/26

On the Evidence of the Transformation in the Fe₃Al Alloy being a Second-Order Phase Change

second-order phase change. There are 5 figures, 2 tables and 10 references, 9 of which are English and 1 Soviet.

ASSOCIATION: Institut pretsizionnykh splavov Tsentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii
(The Precision Alloys Institute of the Central Ferrous Metallurgy Research Institute)

SUBMITTED: June 11, 1957

Card 11/11

AUTHORS: Ravdel', M.P. and Selisskiy, Ya. P. SOV/126-7-6-13/24

TITLE: Investigation of Transformations in Alloyed Permalloy

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6,
pp 885-892 (USSR)

ABSTRACT: The authors have carried out a systematic investigation of hardening of Ni₃Fe-base alloys. The alloying elements used were Mo, Cr, Cu, V, W, Si and Mn and were added to the Ni₃Fe alloy at the expense of iron. The chemical composition of the alloys investigated is shown in a table, p 886. The alloys were melted in a high-frequency induction furnace and cast into ingots of 5 kg, homogenized in hydrogen at 1100°C and subsequently forged partly into billets and partly into rods of 8-9 mm. Specimens for dilatometric and thermomagnetic study ($l = 50$ mm, $d = 3$ mm and $l = 25$ mm, $d = 3$ mm, respectively) and wire of 1 mm diameter were produced from the rods. All electrical resistance measurements were carried out at room temperature on specimens of 1 mm diameter by a potentiometric method. The dilatometric study was carried out on a differential dilatometer of the Shevenar type which was provided with a special device to enable isothermal soaking

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SOV/126-7-6-13/24

Investigation of Transformations in Alloyed Permalloy

to be carried out. The thermomagnetic study was carried out on an Akulov system anizometer. All specimens of the alloys investigated were subjected to stepwise heat treatment (heating to 900°C followed by stepwise cooling, with lengthy soaking at the following temperatures: 550, 500, 450, 400, 350, 300 and 250°C). After soaking, the duration of which varied between 24 and 120 hours depending on temperature, the specimens were immediately quenched in water. Such heat treatment ensured different degrees of order in the specimens in relation to the temperature of quenching. In Fig 1 the change in electrical resistance of a specimen quenched from 900°C in relation to the quenching temperature is shown. In Fig 2 dilatometric heating and cooling curves of a non-alloyed Ni₃Fe alloy, converted to the ordered state by stepwise heat treatment, are shown. In Fig 3 curves are plotted for the dependence of thermal expansion on temperature. Fig 4 shows the change in volume of alloyed Fe-Ni alloys during isothermal tempering in the dilatometer furnace. The tempering temperature was 450°C and the soaking time 5 hours. Fig 5 shows thermomagnetic heating and

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Investigation of Transformations in Alloyed Permalloy

cooling curves. In Fig 6 similar curves are shown for the alloy $Ni_3(Fe,V)$, containing 4% V. The authors arrive at the following conclusions: the introduction of 3% Mn at the expense of iron brings about a considerable intensification of ordering effects in a Ni_3Fe alloy. This is shown by a considerably increased drop in the electrical resistance after stepwise heat treatment. A greater volume effect can be observed in this alloy than in the selected one during disordering and isothermal tempering. The order-disorder transformation temperature of this alloy is higher than that of the Ni_3Fe alloy. The magnetic saturation of the ordered $Ni_3(Fe,Mn)$ alloy is considerably greater than that of the Ni_3Fe alloy, whereas Mn lowers the magnetic saturation of a disordered Ni_3Fe alloy. Such peculiar influence of Mn is due to the structure of its 3d-shell. Other solid solutions, which also contain Mn, become ferromagnetic after ordering. It appears that Mn in the ordered lattice also participates in a magnetic reaction, as a result of which magnetic saturation increases strongly. A supplementary fall in electrical resistance on tempering is associated

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SOV/126-7-6-13/24

Investigation of Transformations in Alloyed Permalloy

with an increase in saturation of the ordered alloy $Ni_3(Fe,Mn)$. Copper brings about a concentration disorder in the Ni_3Fe alloy. Additions of Cr, W and V act on the ordering process of the Ni_3Fe alloy in the same way as Mo (Ref 3), changing the nature of the effects. An anomaly in electrical resistance has been found to exist in Mo permalloy as well as in alloys containing Cr, V and W, i.e. an increase in the electrical resistance after heat treatment in the temperature range at which ordering takes place. All these alloys exhibit identical dilatometric and thermomagnetic anomalies. No lattice contraction, characteristic for the ordered state, occurs in these alloys. Also there is no sharp volume increase on disorder establishment. The dilatometric peculiarities of these alloys are characterized only by a change in the thermal expansion coefficient at the transformation temperature. In all these alloys a temperature range is observed for the ferromagnetic transformation instead of a sharply defined Curie point. Such an effect of Mo, Cr, W and V is due to the fact that complexes are formed in a one-phase solid solution at definite temperatures the

SOV/126-7-6-13/24

Investigation of Transformations in Alloyed Permalloy

Curie points of which differs from that of the basic solid solution. This can be seen even more convincingly in alloys containing Si which forms very stable complexes. There are 6 figures, 1 table and 8 references, 1 of which is Soviet, 2 English, 3 German and 2 French.

ASSOCIATION: TsNIICChM

SUBMITTED: May 15, 1957 (Initially)
June 9, 1958 (After revision)

Card 5/5

36440
S/137/62/000/003/105/191
A060/A101

12.8100
AUTHORS: Artsishevskiy, M. A., Vasil'yev. S. S., Koshelyayev, G. V.,
Selisskiy, Ya. P.

TITLE: Action of deuteron irradiation upon the electric resistance of
alloys undergoing ordering and aging

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 6, abstract 3138
("Sb. tr. Tsent. n.-i. in-t chernoy metallurgii", 1959, no. 22,
168-176)

TEXT: The effect of deuteron irradiation upon the electric resistance R
of alloys Ni₃Fe, Fe₃Al undergoing ordering and of an alloy of Fe with 35% Ni
and 4.5% Ti undergoing aging was investigated. The specimens were irradiated in
a cyclotron with deuterons having an energy of 4 Mev. The thickness of the
specimens constituted 20 - 30 μ. The R measurement was carried out by the
potentiometric method. Because of the small dimensions of the specimens the
voltage and the current leads constituted a single whole with the working part.
The specimens of Ni₃Fe and of Fe₃Al were investigated in the ordered and the
unordered states; the specimens of Fe-Ni-Ti - in the aged and hardened states.

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Action of deuteron irradiation ...

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A060/A101

It was established that when the ordered Fe₃Al alloy is irradiated its R is increased considerably, and the R of the hardened alloy - drops. The bombarding of the Ni₃Fe alloy in the ordered and unordered states causes a considerable decrease in R. In all cases irradiation in fluxes up to $5 \cdot 10^{17}$ deuterons per 1 cm^2 causes a sharp change in R, at a further increase of the total flux the rate of change of R drops. The effects uncovered in the Fe-Ni-Ti alloy do not exceed the limits of experimental errors. It is considered that the most probable process causing the reduction in R is the ordering. A considerable drop in the R of the alloy Ni₃Fe is noted, whose degree of ordering corresponds to a temperature of 250 - 300°C. In this alloy a further occurrence of ordering under irradiation is possible. The shape of the R curves of the irradiated specimens tempered at 250°C confirms the hypothesis as to the attainment of an intermediate degree of ordering as result of the irradiation. In tempering the Ni₃Fe the soaking time of the specimens at the respective temperatures was insufficient to obtain an equilibrium. The character of the R variation of an irradiated unordered specimen is close to the R variation of an unirradiated ordered specimen. In tempering the Fe-Ni-Ti alloy no great difference in the behavior of irradiated and unirradiated specimens was discovered.

A. Rusakov

[Abstracter's note: Complete translation]

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24 (2), 24 (6)

SOV/48-23-5-22/31

AUTHORS:

Borodkina, M. M., Detlaf, Ye. I.,
Selisskiy, Ya. P.

TITLE:

X-ray Investigation of Interrelation in Processes of Recovery,
of Recrystallization and of Ordering in the Alloys Fe-Co and
Ni-Fe (Rentgenograficheskoye issledovaniye vzaimosvyazi pro-
tseessov vozvrata, rekristallizatsii i uporyadocheniya v splavakh
Fe-Co i Ni-Fe)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23,
Nr 5, pp 640 - 642 (USSR)

ABSTRACT:

The increase of free energy in low-temperature deformation by
tensions of the 2nd kind and the increase of the surface ten-
sion occur in consequence of texture destruction. For a number
of solid solutions, the increase of free energy is related to
the stoichiometric energy. These relations are shown in a dia-
gram (Fig 1), in which the solid solution consists of the com-
ponents A and B. In the case of low-temperature deformation, an
increase by the quantity ΔE_m occurs in the free energy of the
solid solution which differs considerably from the stoichic-
metric composition AB. The free energy of the stoichiometric

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X-ray Investigation of Interrelation in Processes of Recovery, of Recrystallization and of Ordering in the Alloys Fe-Co and Ni-Fe SOV/48-23-5-22/31

composition changes by ΔE_n , and the total change of free energy is equal to the sum of both these quantities. Thermodynamic considerations are then made of the recovery, recrystallization and ordering. Next, the results of the radiographic investigation of the recovery and recrystallization of the alloys in question are dealt with. The relationship between recovery and the tensions of the 2nd kind and the distortions of the 3rd kind, revealed by an amplification of the radiographic lines, is made use of. A diagram (Fig 2) shows the microphotometrically plotted curves of the K_α doublet for three Fe-Co alloys, annealed for 30 minutes at 400°C . From the shape of these lines conclusions are drawn as to the stage of recovery. Figures 3 and 4 show series of roentgenograms of the alloys Fe-Co and Ni-Fe, annealed at various temperatures and different compositions. Conclusions as to the stage of recrystallization are drawn on the strength of the interference spots observable here.

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X-ray Investigation of Interrelation in Processes of Recovery, of Recrystallization and of Ordering in the Alloys Fe-Co and Ni-Fe SOV/48-23-5-22/31

There are 5 figures and 5 references, 2 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR
(Institute of Metallurgy imeni A.A. Baykov, Academy of Sciences, USSR)

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S/137/61/000/010/030/056
A006/A101AUTHORS: Detlaf, Ye.I., Selisskiy, Ya.P.

TITLE: On the correlation of ordering, recovery and recrystallization processes in Fe-Co alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 10, 1961, 42, abstract
10Zh264 ("Sb. tr. Tsentr. n.-1. in-t chernoy metallurgii", 1960,
no. 23, 224 - 227)TEXT: An investigation was made with Fe-Co alloys containing up to 20-75% Co. The alloys were subjected to cold rolling with 83.5% total deformation by the 0.5 mm thickness and subsequent annealing at 150 and 750°C in a vacuum at different duration of heating. Subsequently the specimens were electropolished, H_v was measured, and X-ray examination was carried out by the method of reverse exposure on $K\alpha$ -Co radiation. The lowest temperatures of recovery were observed in alloys of stoichiometric composition. If a decrease of free energy, connected with recrystallization, exceeds the increase of free energy connected with softening, then recrystallization has a greater thermodynamical advantage and the

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On the correlation of ordering, ...

S/137/61/000/010/030/056
A006/A101

recrystallization process may cause softening. In the opposite case, softening advances recrystallization. In alloys with 35, 42 and 50% Co both cases occur; this is manifested in the partial splitting-up of the doublet. ✓

P. Zubarev

[Abstracter's note: Complete translation]

Card 2/2

RUSSIAN BOOK EXTRACTS 807/595

Moscow, Technological Institute of Precision Instrument Making Metallurgy, Institute of Precision Instrument Making

Precision Alloys (Precision Alloys) Moscow, Metallurgizdat, 1960. 203 p. (Series: Inst. Zhurnal number, pp. 23) Extra slip inserted. 2,500 copies printed.

Additional Sponsoring Agency: USSR, Gosudarstvennaya planovaya komissiya.

Ed.: D.I. Gerasimov; Ed. of Publishing House: Ye.I. Levit; Tech. Ed.: Ye.B. Vaynshteyn.

FOREWORD: This book is intended for engineers and scientific personnel in the metallurgical, instrument-making, and electrical-equipment industries, as well as for industrial personnel engaged in the production of precision alloys. It may also be useful to students attending advanced technical schools.

CONTENTS: The articles in this collection present the results of investigations conducted in recent years by the Central Scientific Research Institute of Precision Metallurgy (Central Scientific Research Institute of Precision Metallurgy). The articles deal with industrial techniques of producing soft magnetic alloys; properties and structure of the alloys at extremely low temperatures and in high-frequency magnetic fields; deformation textures; magnetization; the galvanomagnetic effect; volume changes, etc. Some articles are concerned with the investigation of ferromagnetic alloys. No personalities are mentioned. The articles are accompanied by references, both Soviet and non-Soviet.

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SELISSKIY, YA. P.

PHASE I BOOK REPLENISHMENT 809/5305

Moscow. Institut stali

Relaksatsionnye yavleniya v metallakh i spлавakh: Trudy Nauchnoissledovatel'skogo Instituta (Relaxation Phenomena in Metals and Alloys: Transactions of the Inter-Institute Conference) Moscow, Metallurgizdat, 1966. 386 p.

Sponsoring Agency: Ministerstvo vysshogo i srednego spetsial'nogo obrazovaniya SPSR and Goskormby Institut stali I.V. Stalina.

Ed.: (Title page): B.K. Finkel'shteyn; Ed., of Publishing House: Ye.I. Lovit; Tech. Ed.: A.I. Karasv.

PURPOSE: This collection of articles is intended for personnel in scientific institutions and schools of higher education and for physical metallurgists and physicists specializing in metals. It may also be useful to students of these fields.

CONTENTS: The collection contains results of experimental and theoretical investigations carried out by schools of higher education and scientific research institutions in the field of the relaxation phenomena in metals and alloys. Several articles are devoted to the investigation-by the internal-friction method-of the decomposition of supersaturated solid solutions. Also analyzed are the defects of the crystalline lattices, plastic deformations, high-temperature behavior of alloys, and creep. Problems of the relation between internal friction and creep brittleness, the use of the method of internal friction in the investigation of powder-metallurgy products, and the mechanics of fatigue are discussed. The collection also contains articles on the aging characteristics of materials, elastic after-effect, and the new slow-diffusion mechanism. No personalities are mentioned. References follow most articles. There are 345 references: 192 Soviet and 174 non-Soviet.

Relaxation Phenomena in Metals (Cont.) 807/5305

Plum: B.Ia. and Den Ge-Sen [Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University)]. Analysis of the Internal Friction of Powder-Metallurgy Products 299

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