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of Metals and Alloys   B006/B017

dau; I. M. Lifshits, and V. G. Peschanskiy on the galvanomagne-
tic characteristics of metals with open Fermi surfaces in
strong magnetic fields; in this connection a paper by Lifshits,
M. Ya. Azbel', and M. I. Kaganov on the relations between
the asymptotic behavior of these characteristics and the topo-
logy of the Fermi surface were analyzed, the resistance change
in the magnetic field was (depending on the direction) found
to increase quadratically or to approach a saturation value,
according to the law by P. L. Kapitsa, however, the increase
should be linear. M. Ya. Azbel' reported on results of the
quantum theory of the electric high-frequency resistance which
he set up; M. Ya. Azbel' and E. A. Kaner investigated the
cyclotron resonance in metals in the region of the anomalous
skin effect in magnetic fields by the aid of the aforemention-
ed theory; M. I. Kaganov investigated the case of a non-quadra-
tic dependence of the electron energy on the impulse; Yu. A.
Bychkov, L. E. Gurevich, and G. M. Nedlin reported on the
thermomagnetic effect in strong magnetic fields; A. A. Smirnov
and M. A. Krivoglaz on a determination of the shape of the
Fermi surface in metals via a determination of the total

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momenta of the photon pairs which are formed in the annihila-
tion of positrons and conduction electrons; A. M. Kosevich on
a theory of the influence exercised by elastic deformation on
the energy spectrum of the electrons in the metal and on
the oscillation of magnetic susceptibility; B. I. Berkin and
I. M. Dmitrenko on the results of an experimental investigation
of the influence of a compression from all sides on the aniso-
tropy and the de Haas-Van Alfen effect in crystals of weakly
magnetic metals; V. L. Gurevich on sound absorption in the
magnetic field in the case of an arbitrary law of dispersion;
G. L. Kotkin on sound absorption in metals for arbitrary Fermi
surfaces; A. A. Galkin and A. P. Korolyuk on the experimental
determination of fluctuations of the ultrasonic absorption co-
efficient in the magnetic field for tin and zinc; M. A. Krivo-
glaz and Ye. A. Tikhonova on the theory of X-ray- and slow
neutron scattering in solid solutions; V. I. Iveronova and A.A.
Katsnel'son on the theory of the intensity distribution of dif-
fused scattering; M. A. Krivoglaz on the scattering of X-rays
and of thermal neutrons; A. A. Smirnov and Ye. A. Tikhonova
on the concentration dependence of the intensity of regular

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reflection and of the background of scattered X-rays; V. M.
Danilenko on dislocations in ordered alloys; A. N. Men' and
A. N. Orlov on the computation of the maximum oscillation
frequency of the atoms of a binary solid solution with cubic
body-centered lattice; A. P. Zvyagina and V. I. Iveronova on
the dependence of the characteristic Debye temperature of an
alloy on the form of the spectrum of the thermal vibrations
of the atoms; K. B. Vlasov on the rotation of the polarization
plane of elastic transversal waves which propagate in a metal
along the direction of the magnetic field; A. A. Berdyshev and
B. V. Karpenko on the interaction of the inner electrons by
means of conduction electrons; B. V. Karpenko and A. A. Berdy-
shev on the interaction of conduction electrons and spin waves
in an antiferromagnetic; L. M. Petrova and Yu. P. Irkhin on
the computation of Hall's constant of a ferromagnetic metal
within the framework of the s-d exchange model by Vonsovskiy;
P. S. Zyryanov, T. G. Izyumova, and G. V. Skrotskiy on the
electric resistance of ferromagnetic metals in the radiofrequen-
cy range near the ferromagnetic resonance; Yu. A. Izyumov and

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G. V. Skrotskiy on the magnetic spin resonance of conduction electrons; A. I. Gubanov on ferromagnetism in amorphous ferromagnetics; M. Ya. Azbel', V. I. Gerasimenko, and I. M. Lifshits on paramagnetic resonance in metals if the skin depth is very small compared to the sample dimensions; V. P. Silin on a macroscopic theory of the optical effects in metals in the range of the normal and of the anomalous skin effect. S. V. Konstantinov and V. I. Perel' on the conductivity and the magnetic susceptibility of a metal in the variable electromagnetic field in taking into account three-dimensional dispersion; B. A. Grinberg and A. N. Orlov on the resistance change in the magnetic field and the Hall effect in a pure metal; A. A. Smirnov and A. I. Nosar' on a theory of the electric resistance of alloys with distorted lattice within the framework of the many-electron model of metal; G. V. Samsonov and V. S. Neshpor on the conductivity of Mo_3Si and $MoSi_2$; 𝛾\
G. V. Samsonov and Yu. B. Paderno on the investigations of the physical properties and the electron configuration of rare earth hexaborides; V. Ye. Mikryukov on the experimental results

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concerning the Wiedemann-Franz law in metals and alloys;
G. Ye. Pikus and V. B. Fiks on the electrotechnical effects
in liquid metals; I. B. Borovskiy and K. P. Gurov on the
influence of impurities on the physical properties of transi-
tion metals; M. I. Korsunskiy and G. P. Borovikova on the in-
fluence of impurities on the X-ray spectra of solids; I. M.
Lifshits on a new type of phase transitions in metals at high
pressures; I. M. Lifshits and G. I. Stepanova on a method of
describing solutions by the introduction of correlation func-
tions for the atom groups; B. N. Finkel'shteyn on the thermo-
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and A. A. Smirnov on the theory of the ordering of alloys
with hexagonal closely packed lattice; I. A. Gindin, B. G.
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ence of low-temperature isomorphic transformations of a series
of metals (alkali, Bi, Be); I. M. Lifshits and V. V. Slezov
on the coagulation of particles in the late stage of decay;
R. I. Garber on the kinetics of pore formation in rock salt
crystals; V. I. Vladimirov on the theory of coagulation of

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surplus vacancies in a solid; B. Ya. Lyubov and A. L. Roytburd on the theory of the growth of martensite crystals; L. N. Larikov on the kinetics of the recrystallization in deformed metals and alloys; I. V. Salli on the problem of the lines of the metastable equilibrium in the diagrams of binary systems; M. I. Zakharova and I. N. Stetsenko on phase transformations in iron-vanadium alloys; K. P. Gurov on the relation between the activation energy of self-diffusion with the characteristic temperature of pure metals; I. M. Fedorchenko and A. I. Raychenko on the volume increase in heating mixed powders; Ye. A. Tikhonova on the diffusion theory of interstitial atoms in alloys of the CuAu type; V. B. Fiks on the mobility mechanism of the impurity ions in metals in an electric field; P. P. Kuz'menko and Ye. I. Khar'kov on experimental investigations of charge transfer in pure metals by means of tracer atoms; I. N. Frantsevich, D. F. Kalinovich, I. I. Kovenskiy, M. D. Smolin, and M. D. Glinchuk on investigations of the mutual charge transfer of both components in binary solid

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solutions of C, Cr, Mo, and tungsten in iron by means of radio-
active isotopes; I. A. Oding and V. N. Geminov on the destruc-
tion of metals in creeping at increased temperatures; I. A.
Oding and L. K. Gordiyenko on the variation of the mechanical
properties of the metals with preceding creeping test; B. Ya.
Pines on characteristics of the diffusion mechanism in creep-
ing; N. S. Zhurkov and A. V. Savitskiy on the experimental
verification of the diffusion theory in the mechanical destruc-
tion in pure silver and in an Ag + 5% Al alloy; N. S. Fastov
on the thermodynamics of irreversible processes in the deforma-
tion of metals; V. I. Khotkevich obtained the same results in
this respect; A. I. Gindin communicated data on the increase
of the plasticity of armco iron at low temperatures by pre-
ceding plastic deformation at higher temperatures. Yu. M.
Plishkin reported on the stable configurations of atomic layers
in expanding cylindrical crystals into the direction of the
axis. K. P. Rodionov reported on the anomalous change of
physical properties of a solid in a temperature range which,
in general, does not coincide with the melting temperature.

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LARIKOV, L.N

PHASE I BOOK EXPLOITATION   SOV/5511

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti.
Kiyevskoye oblastnoye pravleniye.

Metallovedeniye i termicheskaya obrabotka (Physical Metallurgy and Heat
Treatment of Metals) Moscow, Mashgiz, 1961. 355 p. Errata slip
inserted. 5,000 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet
Soveta Ministrov UkrSSR. Nauchno-tekhnicheskoye obshchestvo
mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye
pravleniye.

Editorial Board: M. P. Braun, Doctor of Technical Sciences, I. Ya.
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nical Sciences; Ed.: M. S. Soroka; Tech. Ed.: M. S.
Gornostaypol'skaya; Chief Ed., Mashgiz (Southern Dept.): V. K.
Serdyuk, Engineer.

Card 1/10

PURPOSE: This collection of articles is intended for scientific
workers and technical personnel of research institutes, plants,
and schools of higher technical education.

COVERAGE: The collection contains papers presented at a convention
held in Kiyev on problems of physical metallurgy and methods of
the heat treatment of metals applied in the machine industry.
Phase transformations in metals and alloys are discussed, and
results of investigations conducted to ascertain the effect of
heat treatment on the quality of metal are analyzed. The pos-
sibility of obtaining metals with given mechanical properties
is discussed, as are problems of steel brittleness. The col-
lection includes papers dealing with kinetics of transformation,
heat treatment, and properties of cast iron. No personalities
are mentioned. Articles are accompanied by references, mostly
Soviet.

TABLE OF CONTENTS:

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LARIKOV, L.N.

Kinetics of subgrain growth. Sbor. nauch. rab. Inst. metallofiz.
AN URSR no.13:47-50 '61.   (MIRA 14:12)
                        (Metal crystals--Growth)

35177
S/601/61/000/013/009/017
D207/D304

18.7500

AUTHOR: Larikov. L. N.

TITLE: The mechanism of the effect of small amounts of impu-
               rities on recovery in metals

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzy-
               ky. Sbornik nauchnykh rabot, no. 13, 1961. Voprosy fi-
               ziki metallov i metallovedeniya, 100-103

TEXT: The author reviews briefly the published data on the strong
effect of even very small amounts of impurities on the recovery
(relaxation) in metals and alloys during annealing. The data are
used to show that impurities affect changes of physical properties
chiefly by interaction with crystal defects: by deformation of
Cottrell atmospheres at edge and screw dislocations and by forma-
tion of vacancy-impurity pairs. There are 27 references: 11 So-
viet-bloc and 16 non-Soviet-bloc. The 4 most recent references to
the English-language publications read as follows: N. F. Mott,
Dislocations and mechanical properties of crystals, New York,

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The mechanism of ...

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1957, p. 350; Discussion of the preceding reference; R. B. Nichol-
son, G. Thomas and J. Nutting, J. Inst. Metals, 87, 429, (1959);
G. Thomas, Phil. Mag., 4, 606, (1959).

SUBMITTED: September 1, 1960

Card 2/2

35178
S/601/61/000/013/010/017
D207/D302

18·11⁰⁰

AUTHOR: Larikov, L. N.

TITLE: Investigating the kinetics of recrystallization in tempering of quenched iron-chromium alloy

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik nauchnykh rabot, no. 13, 1961. Voprosy fiziki metallov i metallovedeniya, 104-105

TEXT: The author describes a study of recrystallization of a quenched iron-chromium alloy, containing 8.25% Cr, 0.5% C, 0.09% Si and 0.07% Mn. The results were reported first at the Conference on Physical Metallography held in Dnepropetrovsk in 1958. Samples of the alloy were quenched in water from 950°C. Their initial Vickers hardness was 350 kg/mm². The rate of recrystallization, measured by X-ray diffraction, of quenched samples was very much slower than that of compression-deformed samples of similar initial hardness (365 km/mm²). The temperature dependence of the rate

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Investigating the kinetics ...   S/601/61/000/013/010/017
                                              D207/D302

of crystallization was, however, the same for quenched and deformed
samples. The higher stability of the hardened state in the quen-
ched alloy was due to the lower defect density in it, compared
with the plastically deformed alloy. There are 1 figure and 8 re-
ferences: 7 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: January 23, 1960

Card 2/2   X

BYKHOVSKIY, A.I.; LARIKOV, L.N.; OVSIYENKO, D.Ye.

Mechanism of crystal growth in the $\alpha \rightleftarrows \beta$-transformation of p-dichlorobenzene. Kristallografiia no.2:284-286 Mr-Ap '61.

1. Institut metallofiziki AN USSR. i Ukrainskaya akademiya sel'sko-khozyaystvennykh nauk.
(Phase rule and equilibrium) (Benzene)
(Crystals--Growth)

ZASIMCHUK, Ye.E. [Zasymchuk, IE.E.]; LARIKOV, L.N.

Kinetics of the growth and coagulation of phases formed during
aging in a nickel - titanium alloy. Ukr. fiz. zhur. 6 no.4:
514-521 Jl-Ag '61.   (MIRA 14:9)

1. Institut metallofiziki AN USSR, g. Kiyev.
                    (Nickel-titanium alloys)
                    (Phase rule and equilibrium)

S/180/62/000/003/010/016
E111/E152

AUTHORS: Zasimchuk, Ye.E., Kurdyumov, G.V., and Larikov, L.N.
             (Kiyev)

TITLE: Influence of aluminium and titanium on the linear rate
             of growth of recrystallization nuclei in deformed
             nickel and nichrome

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
             tekhnicheskikh nauk. Metallurgiya i toplivo,
             no.3, 1962, 85-87

TEXT: The effect of 0-16.6 % a:. Al and 0-12.5 % at. Ti,
present separately, on the linear rate of growth of
recrystallization nuclei in 80% deformed nickel and nichrome
specimens, was studied. Recrystallization annealing was effected
at 200-800 °C with holding time of 5 minutes to 10 hours. The
measure of recrystallization rate was the time required for the
formation and growth of the first nuclei to a certain size.
This time was determined by the X-ray method using Cr radiation
(Ref.5: Zasimchuk, Ye.E., Larikov, L.N. DAN URSR, no.1, 1959, 42).
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Influence of aluminium and titanium...   S/180/62/000/003/010/016
                                           E111/E152

The rate of growth was found to follow the usual exponential law.
The term, characterising the temperature dependence of the rate,
rises from 48 ± 2 kcal/g.atom for pure nickel to 82 ± 3 when
1 % at. Al, and to 88 ± 3 when 1 % at. Ti are added. Further
additions of Al or Ti have no effect. The mechanism causing the
lowering of the linear rate of growth of the recrystallization
centres on passing into the two-phase region was attributed to
the effect of the precipitation of the dispersed particles of the
second phase and was studied by one of the authors (Ref.12:
Larikov, L.N. Izd. AN USSR, no.11, 1960, 61).
There are 2 figures and 1 table.

SUBMITTED: March 28, 1961

Card 2/2

AUTHORS: Larikov, L.N., and Zasymchuk, Ye.E.

TITLE: Investigating the kinetic of primary recrystallization in iron and nickel of high-degree purity

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 6, 1962, 771 - 773

TEXT: The authors have previously shown that the presence of even quite small impurities has a considerable effect on the kinetics of primary recrystallization especially on the linear velocity of the growth of the recrystallization centers in highly deformed iron and nickel. In the present work a study is made of the temperature dependence of the linear velocity of the growth of the recrystallization centers in carbonyl nickel and iron of high purity (99.99 %). The principal impurities in the iron were C, Mn and Si and also traces of Ni, Mo, and Cu. The principal impurities in the carbonyl nickel were C, Fe, S, Cu, Si. The metals were remelted in a vacuum and deformed by 80 % compression at room temperatures. The annealing was carried out in the temperature range 240 - 370°C from 25

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november 21, 1961 ..., member of the AS UkrSSR

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S/185/62/007/002/011/016
D299/D302

AUTHORS: Zasymchuk, O.E., and Larikov, L.N.

TITLE: Linear growth rate of recrystallization sites in
             niobium

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 2, 1962,
             202 - 204

TEXT: The temperature dependence was studied of the linear growth
rate of recrystallization in niobium (99.997 % pure), deformed by
94 %) by uniaxial compression at room temperature. The specimens
were heated in evacuated quartz containers; the temperature varied
between 960 and 1080°C. The recrystallization rate was measured by
the time τ, after which the first visible recrystallization sites
(of size L) appeared. In the references it was shown that τ is main-
ly determined (in very deformed metals), by the linear growth rate,
G. X-ray pictures of the specimens were taken. A figure shows the
microstructure of niobium, tempered for 1 hour at a temperature of
1005°C. Another figure shows the graph lgG versus 1/T. The depen-

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Linear growth rate of ...

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dence is practically linear and can be described by the equation:

$$G = G_o \exp(-Q_G/RT) = 10^{16}\exp(-\frac{130000 \pm 10000}{RT})cm/sec.$$

The large values of G_o and Q_G are noted; they are apparently due to the presence of impurities. A similar effect was observed by other investigators in aluminum and also in nickel. The obtained results were compared with the results of L.I. Lysak, and L.V. Tykhonov (Ref. 5: Pytannya fizyky metaliv ta metaloznavstva, Vyd-vo AS Ukr-RSR, Kyyiv, 1958, p. 20), concerning tempering of niobium. Of sig-nificance is a considerable decrease in the hardness of very defor-med (at room temperature) niobium, aged at 650 - 950°C before recry-stallization. There are 2 figures and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language pub-lications read as follows: W. Anderson, R.F. Mehl, Trans. AIME, 161 140, 1945; T.E. Tietz, R.A. Anderson, J.E. Dorn, Trans. AIME, 185, 921, 1949.

ASSOCIATION: Instytut metalofizyky AN URSR (Institute of Physics of Metals of the AS UkrRSR), Kyyiv

SUBMITTED: March 17, 1961   Card 2/2

S/185/62/007/010/015/020
D234/D308

AUTHORS: Dubovyts'ka, N. V., Zasymchuk, O. E., Larikov, L. N.
and Petrov, Yu. M.

TITLE: X ray methods for the investigation of the kinetics
of growth of recrystallization centers

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 10, 1962,
1134-1136

TEXT: To determine more accurately the dimensions of recrystalli-
zation centers corresponding to the appearance of 'punches', thin
(0.05 mm) carbonyl Ni foils (99.99% Ni) were studied by electron
microscopy, after which x ray photographs at Cu K$_\alpha$ wavelength were
taken. Appearance of centers with maximum dimension $L = 2 \times 10^{-4}$ cm
after annealing during 15 min at 520°C corresponds to the appear-
ance of first 'punches' on x ray photographs. Centers with $L =$
7×10^{-4} cm correspond to very large quantities of spots and even
to disappearance of the continuous line background. There is 1
figure.
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X ray methods for ...

S/185/62/007/010/015/020
D234/D308

ASSOCIATION: Instytut metalofizyky AN URSR, m. Kyyiv (Institute of Metal Physics, AS UkrSSR, Kiev)

SUBMITTED: July 4, 1962

Card 2/2

LARIKOV, L.N.; ZASIMCHUK, Ye.E. [Zasymchuk, O.E.]

Effect of molybdenum and tantalum additives on the rate of grain growth in nickel. Ukr.fiz.zhur. 7 no.11:1237-1241 N '62. (MIRA 15:12)

1. Institut metallofiziki AN UkrSSR, Kiyev.
   (Nickel—Metallurgy) (Crystallization)

S/601/62/000/015/004/010
A004/A127

AUTHOR: Larikov, L.N.

TITLE: "Composition vs. weakening rate" diagrams and their use in the phys-
            ico-chemiqal analysis of metallic systems

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik
            nauchnykh rabot. no. 15. Kiev, 1962. Voprosy fiziki metallov i
            metallovedeniya, 131 - 136

TEXT: This paper was read by the author at the Vsesoyuznoye soveshchaniye
po fiziko-khimicheskomu analizu (All-Union Conference on Physico-Chemical Analy-
sis) taking place in Moscow in 1960. The author compares various "composition vs.
recrystallization time" diagrams, particularly those plotted by V.I. Iveronova
(V.I. Iveronova, G.S. Zhdanov: Rentgenografiya v primenenii k issledovaniyu ma-
terialov - Application of Roentgenography in the Testing of Materials, ONTI,
1936, p. 369; V.I. Iveronova: Primeneniye rentgenovskikh luchey k issledovaniyu
materialov - Application of x-rays in the Testing of Materials. Mashgiz, 1949,
34) and points out a number of inaccuracies in these diagrams. He stresses the

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LARIKOV, L.N.,

Application of the activation energy concept to the analysis of the
mechanism of alloy recovery processes. Sbor. nauch. rab. Inst.
metallofiz. AN URSR no.15:137-141 '62.
(Activation analysis)   (MIRA 15:12)
                                    (Crystallization)

S/601/62/000/015/006/010
A004/A127

AUTHORS: Zasimchuk, Ye.E., Larikov, L.N.

TITLE: Investigating the temperature and concentration dependence of the
               effect of chromium and molybdenum on the growth rate of recrystalli-
               zation nuclei in nickel

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Sbornik
               nauchnykh rabot. no. 15. Kiev, 1962. Voprosy fiziki metallov i
               metallovedeniya, 147 - 151

TEXT: The results of the present work of investigating binary nickel alloys
with chromium and molybdenum, containing up to 28 atomic % Cr and up to 20.6 ato-
mic % Mo were presented at the VI Vsesoyuznoye soveshchaniye po primeneniyu rent-
genovskikh luchey k issledovaniyu materialov (VI All-Union Conference on the Ap-
plication of x-rays in the Testing of Materials) convened at Leningrad from June
23 to 28, 1958. Most of the alloys tested belonged to the range of homogeneous
solid solutions. Only alloys containing 17.3 atomic % and 20.6 atomic % Mo had a
biphase structure in the annealed state. The measure of the recrystallization

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Investigating the temperature and concentration ....

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rate at a given temperature T was time τ, necessary for the origination and growth of the first recrystallization nuclei up to dimension L. The results of the present investigation show that, within the tested temperature and annealing--time range, all alloys are subject to the ordinary exponential function:

$$G = G_0 \, e^{-\frac{Q_G}{RT}} \, . \tag{2}$$

The values of constants in this equation expressing the temperature dependence of the linear growth rate of the recrystallization nuclei for the alloys tested are given in a table. The authors emphasize the strong effect of small additions of chromium and molybdenum on the temperature dependence of magnitude G. With higher Cr and Mo-contents only comparatively insignificant changes are observed both in the growth rate of the recrystallization nuclei and in its temperature dependence. There are 2 figures and 2 tables.

SUBMITTED: May 6, 1961

Card 2/2

LARIKOV, L.N.; ZASIMCHUK, Ye.E.; SHKIROV, V.S.

Effect of small additions of carbon on the kinetics of recovery and recrystallization of alpha-iron. Fiz. met. i metalloved. 14 no.2: 218-222 Ag '62.   (MIRA 15:12)

1. Institut metallofiziki AN UkrSSSR.
    (Annealing of metals)   (Iorn—Metallography)

LARIKOV, L.N.

Diagram "composition - speed of recovery" and their use in the physiocochemical analysis of metal systems. Sbor. nauch.rab. Inst. metallofiz. AN URSR no.15:131-136 '62. (MIRA 15:12)
(Alloys—Metallography)   (Phase rule and equilibrium)

LARIKOV, L.N.; YURCHENKO, Yu.F.

Methods of measuring small heat effects during recovery and phase
transformations in metals and alloys. Sbor. nauch. rab. Inst.metallofiz.
AN URSR no.16:213-219   '62.   (MIRA 16:5)
            (Metallography) (Phase rule and equilibrium)

AM4017086

BOOK EXPLOITATION

s/

Gertsriken, S. D.; Dekhtyar, I. Ya.; Krivoglaz, M. A.; Larikov, L. N.; Lysak,
L. I.; Nesterenko, Ye. G.; Novikov, N. N. ; Sosnina, Ye. I.; Slyusar, B. F.;
Tikhonov, L. V.; Trefilov, V. I.; Chuistov, K. V.

Physical bases of the strength and ductility of metals (Fizicheskiye osnovy*
prochnosti i plastichnosti metallov) Moscow, Metallurgizdat, 1963. 321 p.
illus., biblio. Errata slip inserted. 4250 copies printed. Editor of the
publishing house: Ye. N. Berlin; Technical editor: L. V. Dobuzhinskaya;
Bindery artist: Yu. M. Vashchenko

TOPIC TAGS: strength of metals, ductility, crystal lattice, dislocations, metal
failure, strain hardening, solid solution, microstress, lattice defect, plastic
strain, relaxation, polygonization, recrystallization, grain growth

PURPOSE AND COVERAGE: This collection of articles is intended for scientific
personnel and for engineers and metals physicists; it also may be useful to stu-
dents at metallurgical and machine-building vuzes. The results of study of
crystal-lattice imperfections and the dislocation theory of metal failure are

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AM4017086

presented. Contemporary concepts of the nature and mechanism of different weak-
ening processes in metals are expounded, as well as present-day thinking concer-
ning the effect of impurities on the kinetics of the weakening processes. The
articles in this collection are principally the original results of research
performed in recent years at the Institut Metallofiziki AN USSR.

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AM4017086

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1. Plastic strain and the failure of metals (V. I. Trefilov) -- 190
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SUB CODE: ML, AP   SUBMITTED: 23Aug63   NR REF SOV: 253

OTHER: 463   DATE ACQ: 17Jan64

Card 3/3

ACCESSION NR: AT4013948

S/2659/63/010/000/0190/0193

AUTHOR: Larikov, L. N.; Zasimchuk, Ye. E.

TITLE: Kinetics of the collective recrystallization of pure nickel and of nickel with tantalum and molybdenum admixtures

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochny*m splavam, v. 10, 1963, 190-193

TOPIC TAGS: metal recrystallization, alloy recrystallization, nickel, tantalum, molybdenum, nickel alloy, tantalum containing alloy, molybdenum containing alloy

ABSTRACT: Under uniform annealing conditions, the grains of metals with admixtures are generally smaller than in pure metals. However, quantitative data on the influence of admixtures on the rate of grain growth are still limited. The authors have investigated the influence of small admixtures (1%) of tantalum and molybdenum on the collective re- crystallization kinetics of pure nickel. It was found that in pure nickel $U = 34$ Cal/g · atom, while for nickel with molybdenum $U = 40$ Cal/g · atom and for nickel with tantalum $U = 68$ Cal/g · atom. For pure nickel, U is near the activation energy of nickel self- diffusion (26 Cal/g · atom), and the grain size distribution is as shown in the Enclosure.

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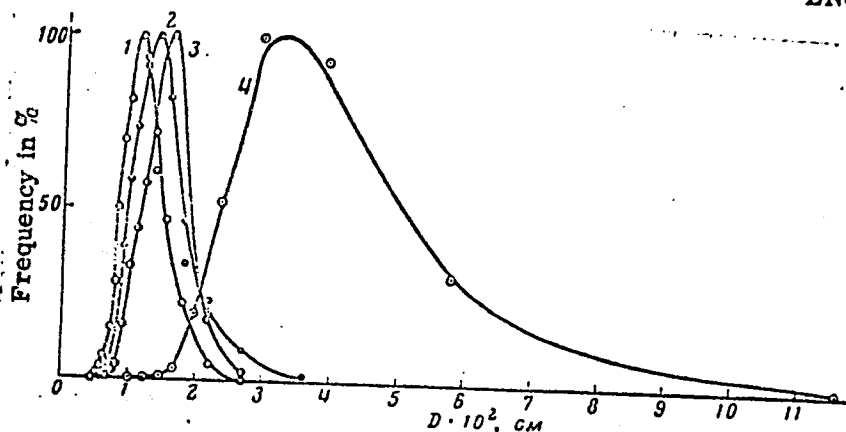
Fig. 1. Distribution of grain size in pure Ni at 610°C.

Duration of annealing: 1-2 min.; 2-30 min.; 3-2 hrs.; 4-7 hrs.

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ACCESSION NR: AT4013948

Molybdenum admixtures significantly delay the growth rate of nickel grains, while tantalum has an even greater effect on this process. Both of these metals (molybdenum and tantalum) influence grain growth in the same way. Orig. art. has: 3 figures.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute AN SSSR)

SUBMITTED: 00   DATE ACQ: 13Mar64   ENCL: 01

SUBCODE: ML   NO REF SOV: 004   OTHER: 005

Card 2/3

GERTSRIKEN, S.D. [deceased]; LARIKOV, L.N.; NOVIKOV, N.N. [Novykov, M.M.]

Volume changes in low-temperature phase transitions in nichrome.
Ukr. fiz. zhur. 8 no.4:494-496 Ap '63.   (MIRA 16:8)

1. Institut metallofiziki AN UkrSSR i Gosudarstvennyy universitet
im. Shevchenko, Kiyev.
            (Nichrome)   (Deformations (Mechanics))

L 10731-65   EWT(m)/EPF(n)-2/EWP(b)   Pu-4   ASD(m)-3/ASD(f)-2   JD/JG/WLZ
ACCESSION NR: AT4046829   S/0000/64/000/000/0121/0124

AUTHOR: Larikov, L. N.; Zasimchuk, Ye. E.; Semenenko, M. N.

TITLE: Parameters of recrystallization of niobium and tungsten

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledo-
vaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka,
1964, 121-124

TOPIC TAGS: niobium, tungsten, niobium recrystallization, tungsten recrystalliza-
tion, microhardness, annealing

ABSTRACT: The stability of the hardened condition of metals at high temperatures
may be expressed to some degree by the recrystallization rate parameters. How-
ever, there is little information in the literature on the growth rate of recry-
stallization centers in various metals. The present authors investigated pure
niobium (99.997%) and pure tungsten containing 0.02% C, 0.006% Si, 0.01% P, 0.015%
Fe, 0.008% S, 0.0022% Cd, 0.0004% Pb, 0.00008% Bi, and 0.003% Sn. Niobium was
subjected to 94% uniaxial compression at room temperature, and recrystallization
annealing was carried out at 960-1080C. Tungsten was rolled (90% compression) at
1200C in air, annealed at 1300-2000C in a vacuum on a modified TVV-2M machine.

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L 10731-65

ACCESSION NR: AT4046829

The recrystallization rate was determined from the appearance of "punctures" on the X-rays, taken after etching with HNO_3 + HF. A linear inverse relationship was obtained in both cases between the logarithm of the growth in recrystallization centers and the reciprocal of the absolute temperature: $G = G_0 \exp(-Q_G/RT)$ where G_0 is 10^{16} and 10^{15} cm/sec. for Nb and W, respectively, and Q_G is 130-180 kcal./g-atom. The microhardness of tungsten was also measured for different annealing temperatures, and found to decrease sharply at 1200C. Comparison showed that niobium is weakened prior to recrystallization, while tungsten is weakened during recrystallization. Niobium is thus deformed at relatively lower temperatures in relation to the melting point. Orig. art. has: 4 figures and 6 formulas.

ASSOCIATION: none

SUBMITTED: 16Jun64   ENCL: 00   SUB CODE: MM

NO REF SOV: 012   OTHER: 006

Card 2/2

LARIKOV, L.N.; DUBOVITSKAYA, N.V. [Dubovyts'ka, N.V.]; ZASIMCHUK, Ye.E.
[Zasymchuk, O.E.]

Electron microscopy of the growth kinetics of recrystallization
centers in deformed nickel and nickel-aluminum alloys. Dop. AN
URSR no.7:916-918 '64.   (MIRA 17:9)

1. Institut metallofiziki AN UkrSSR. Predstavleno akademikom
AN UkrSSR V.N.Svechnikovym [Sviechnykov, V.M.].

LARIKOV, L.N.

Changes of volume and thermal effect during the heating of
deformed metals. Sbor. nauch. rab. Inst. metallofiz. AN
URSR no.18:35-39 '64
(MIRA 17:8)

L 15654-65   EWT(1)/EWT(m)/T/EEC(b)-2/EWP(b)/EWP(t)   Pad   ASD-3/AFFTC/
ESD-3/RADC/IJP(c)/ESD(gs)/AFWL/ASD(a)-5/ASD(m)-3/AFETR   JD/HW/MLK

ACCESSION NR: AT4046813   S/0000/64/000/000/0038/0043

AUTHOR: Larikov, L. N.; Yatsenko, T. K.; Slastnikova, L. F.; Kumok, L. M.   B/

TITLE: The effect of crystal lattice type on the mobility of atoms along the
grain boundaries

SOURCE: AN SSSR. Nauchnyy sovet po probleme zharoprochny*kh splavov. Issledo-
vaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka,
1964, 38-43

TOPIC TAGS: crystal lattice, atom mobility, grain boundary, cobalt iron alloy,
diffusive coefficient, alloy recrystallization

ABSTRACT: The effect of the crystal lattice type on the diffusion parameters
along the grain boundary was studied using different methods to determine the
diffusion boundary coefficients. The particular interest of this work was the in-
fluence of the crystal lattice type on the mobility of cobalt atoms along the
grain boundaries of Co-Fe alloys. Cobalt diffusion in alloys with 12.58 wt.% and
25.67 wt.% Fe was studied at 560-725C. Measurements of the volume diffusion co-
efficient of cobalt in the α and γ phases of the Co-Fe alloy showed that in a body-
centered lattice the volume diffusion is significantly faster than in a closely
packed face-centered lattice. The diffusion coefficients determined by

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L 15654-65
ACCESSION NR: AT4046813 O

Gertsriken's method had close values in the α and γ-phases. From this data, the
temperature dependence of the diffusion coefficients of cobalt along the grain
boundaries of Co-Fe was plotted, and parameters were calculated. The methods of
Fisher and Levin were used for comparison and the activation energy of the cobalt
diffusion was determined. Experimental results confirm that the boundary diffusion
coefficients depend less on the crystal lattice type than on the mobility of
atoms. The speed of certain weakening processes connected with atom-mobility in
the body and along the grain boundary was studied in the cobalt alloys with dif-
ferent crystal lattices. The kinetics of recrystallization and of the contraction
of X-ray interference lines was also followed. The differences noted in the pro-
perties are explained by the fact that the rate of growth of the recrystallization
centers is linked with the atom mobility along the grain boundary, while the
speed of the X-ray interference lines contraction is tied to atom mobility in the
body. Orig. art. has: 4 figures, 4 formulas and 4 tables.

ASSOCIATION: none

SUBMITTED: 16Jun64   ENCL: 00   SUB CODE: MM

NO REF SOV: 007   OTHER: 003

Card 2/2

L 24849-65   EWT(m)/EWP(t)/EWP(b)   Pad   IJP(c)/ASD(f)-3/AFETR   JD/HW/JG

ACCESSION NR: AP4046090   S/0126/64/018/003/0385/0388

AUTHOR: Larikov, L. N.; Petrov, Yu. N.; Borimskaya, S. T.

TITLE: The kinetics of the heterogeneous disintegration of a supersaturated solid solution of beryllium in nickel

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 3, 1964, 385-388

TOPIC TAGS: beryllium, nickel, heterogeneous disintegration, homogeneous disintegration, kinetics, cell growth

ABSTRACT: Based on the results of other authors, the kinetics of the heterogeneous disintegration of a supersaturated solid solution in an Ni alloy with 1.92 w% Be prepared in an induction furnace were investigated. Optical analysis and an electron microscope were applied. The kinetics of the heterogeneous disintegration were plotted in a diagram according to the equation:

$$\chi_{transform.} = 1 - \exp\left[-b_s^{-\frac{1}{3}} I_s(a_s)\right].$$

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L 24849-65

ACCESSION NR: AP4046090

2

Disintegration is controlled by the diffusion of the atoms of the alloying elements that are contained in the precipitating phase. The evaluation of the linear rate of growth of eutectoid-type cells which are composed of alternate lamina of the precipitating phase and the depleted matrix was carried out with a view to the effect of the length of isothermal annealing on the maximum size of the cells in the direction of their growth. At the initial stage, the heterogeneous disintegration is accompanied by homogeneous disintegration contrary to the processes in other alloys where the heterogenous disintegration sets in 50 hours after the beginning of annealing at 800C. All experimental data coincided with the work of other authors. The contribution of N. N. Buynov is acknowledged. Orig. art. has: 3 figures , 6 equations, and 1 table

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

SUBMITTED: 16Oct63   ENCL: 00

SUB CODE: MM   NO REF SOV: 009   OTHER: 012

Card 2/2

L 41360-65   EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t)   Pf-4/Pad   IJP(
ACCESSION NR: AP4046095   JD/HW   S/0126/64/018/003/0454/0456

AUTHOR: Kozyrskiy, G. Ya.; Larikov, L. N.; Petrunin, G. A.; Shmatko, O. A

TITLE: The effects of the degree of deformation on polygonization and recrystallization of nickel

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 3, 1964, 454-456

TOPIC TAGS: nickel deformation, polygonization, recrystallization, X ray analysis, metallographic examination

ABSTRACT: An investigation of the effects of deformation on the polygonization and recrystallization of Ni showed that the presence and the location of the point of intersection of the lines describing this relationship are conditional and affected by the choice of the quantitative characteristic of the two processes. Experiments were carried out with 99.99% pure Ni melted in argon. Specimens were compressed at different temperatures to 30-80%, annealed for 8 hrs. and examined by metallographic and X-ray method. The temperature at which the initial recrystallization nuclei attain 10^{-3} cm within eight hours was chosen as the quan

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L 41360-65
ACCESSION NR: AP4046095

titative characteristic for recrystallization and for polygonization--the temperature at which interference spots narrow by 25%. In Ni compressed by 80% the initial 10^{-3} cm nuclei appear at 280 C and X-ray interference lines narrow by 20%. The findings of the authors stand in good agreement with other papers. Orig. art. has: 3 figures

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

SUBMITTED: 15Oct63   ENCL: 00

SUB CODE: MM   NO REF SOV: 007   OTHER: 003

CC

Card 2/2

L 35424-65   EWT(1)/EWT(m)/EPR/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c)   Ps-4/Pad   IJP(c)
ACCESSION NR: AP4042823   JD/HW   s/0021/64/000/007/0916/0918

AUTHOR: Larikov, L. N.; Dubovyts'ka, N.V. (Dubovitskaya, N.V.); Zasymchuk, O. E.
(Zasimchuk, ~~~~~~~~~~)

TITLE: Electron microscope study of the kinetics of the growth of recrystalliza-
tion centers in deformed nickel and nickel-aluminum alloy

SOURCE: AN UkrSSR. Dopovidi, no. 7, 1964, 916-918

TOPIC TAGS: recrystallization, recrystallization kinetics, crystal growth, crys-
tal growth rate, nickel, nickel base alloy, electron microscopy, retarded crystal
growth

ABSTRACT: The electron microscope (transmission method) was used to investigate
the rate of growth of recrystallization centers of vacuum-remelted carbonyl nickel
(99.9%) and a nickel-base alloy containing ~5% by weight of aluminum, deformed by
rolling by ~97%. The time of formation of the first recrystallization centers is
negligible as compared with the time of their growth to visible dimensions, while
the rate of growth of freely growing centers proved to be constant in time even
with small dimensions of the centers (less than 1 micron). Addition of Al to pure

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L 35424-65

ACCESSION NR: AP4042823

nickel sharply retards the growth of recrystallization centers, since the time of formation of the first centers remains negligibly small in the alloy as compared with the time of their growth to visible dimensions.

ASSOCIATION: Instytut metalofizyky AN URSR (Institute of Physics of Metals, AN URSR)

SUBMITTED: 11Oct63   ENCL: 00   SUB CODE: SS, MM

NO REF SOV: 002   OTHER: 002

Card 2/2

L 34103-65   EWT(m)/EWA(d)/EWP(t)/EWP(k)/EWP(b)/EWA(c)   Pf-4/Pad   IJP(c)   JD/HW/JG
ACCESSION NR: AT5005120   S/2601/64/000/019/0148/0154

AUTHOR: Larikov, L. N.; Petrov, Yu. N.; Borimskaya, S. T.

TITLE: Investigation of structural changes with a biphasic decomposition mecha-
nism in Ni- Be alloys

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 19,
1964. Voprosy fiziki metallov i metallovedeniya (Problems in the physics of me-
tals and physical metallurgy), 148-154

TOPIC TAGS: biphasic decomposition, work hardening, cell distance, nickel alloy,
beryllium alloy, alloy structure, heterogeneous decomposition, alloy hardness,
xray analysis

ABSTRACT: The authors discuss the structural changes occurring during biphasic
decomposition in 8 x 6 x 2 mm specimens of Ni (99.99%) with 1.92% Be prepared in
a high-frequency vacuum furnace. The initial stages of the decomposition pro-
cesses in supersaturated solid solutions of Be in Ni are characterized by an ap-
preciable work-hardening of the specimens (see Fig. 1 of the Enclosure). At ele-
vated temperatures, maximum work-hardening is induced by shorter holding periods
and lesser quantities of the transformed volume. The interlaminar cell distance

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L 34103-65

ACCESSION NR: AT5005120

was calculated by standard methods and diagrams were plotted showing the effect of the number of cells on cell distance. The mean value of the real minimum distance was derived from extrapolation on the vertical axis of the extrapolated straight line obtained at different isothermal annealing periods. The authors found that in their experiments the value of the minimum interlaminar distance did not change with annealing time but increased with the rise in temperatures, proving that the processes develop under different conditions. Orig. art. has: 6 figures.

ASSOCIATION: Institut metallofiziki AN Ukr.SSR (Metal physics institute, AN Ukr.SSR)

SUBMITTED: 06Jul63

NO REF SOV: 005

ENCL: 02

OTHER: 005

SUB CODE: MM

Card 2/4

L 34103-65
ACCESSION NR: AT5005120   ENCLOSURE: 01
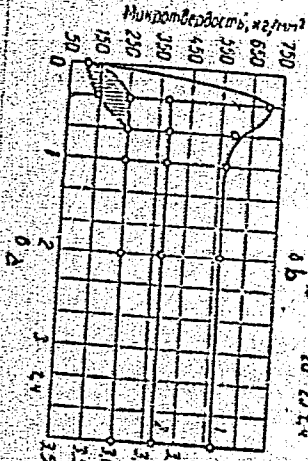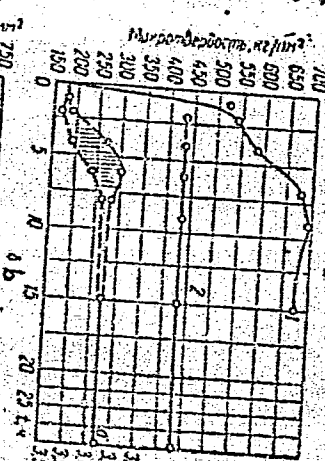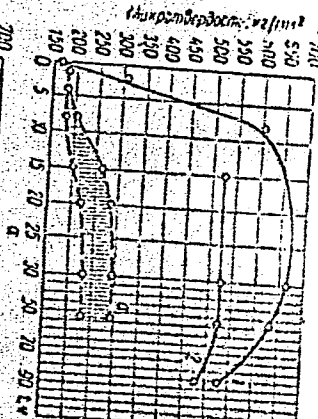
Card 3/4

L 34303-65
ACCESSION NR: AT5005120   ENCLOSURE: 02

Figure 1. Heterogeneous decomposition in an Ni - Be alloy investigated by X-ray
examination and microhardness tests: (a) annealing temperature 450 C; (b) same,
500 C; (c) same, 550 C; (1) microhardness of light zones; (2) microhardness of
dark zones.

Card   4/4

L 34105-65   EWT(m)/EPR/T/EWP(t)/EWP(b)/EWA(c)   Pad/Ps-4   IJP(c)   JD/HM
ACCESSION NR: AT5005127   S/2601/64/000/019/0219/0231

AUTHOR: Larikov, L. N.; Zasimchuk, Ye. E.

TITLE: Experimental methods of investigating the kinetics of recrystallization
in metals

SOURCE: AN UkrSSR. Institut metallofiziki. Sbornik nauchnykh trudov, no. 19,
1964. Voprosy fiziki metallov i metallovedeniya (Problems in the physics of me-
tals and physical metallurgy), 219-231

TOPIC TAGS: xray examination, microstructural analysis, electron microscopy, de-
formation rate, recrystallization nucleus, grain growth, metal recrystallization,
nickel alloy, aluminum alloy, recrystallization kinetics

ABSTRACT: The authors review a number of Western and Soviet papers concerned with
the investigation of the general kinetics of recrystallization. For specimens
reduced by 20%, microstructural examination was found most appropriate since
higher degrees of deformation make it difficult to distinguish the nuclei of re-
crystallization from the surrounding distorted grains. However, microstructural
analysis is also recommended at any other desired degree of deformation in the
observation of single crystals. Another possible method involves the use of se-

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L 34105-65
ACCESSION NR: AT5005127

lective evaporation along grain boundaries to investigate individual grain growth, but this method is only applicable at temperatures exceeding the fusion point of the specimen. Electron microscopy proved most reliable in observing the rate of grain growth of the nuclei of recrystallization in specimens reduced by 80% as well as in slightly deformed metals. X-ray examination is suitable for a quantitative study of highly deformed metals. In vacuum-treated Ni and its alloys (5.3% by weight Al) reduced by 98% by rolling, the nuclei of recrystallization develop at an invariable rate and the time of formation of the initial nuclei is $\tau \approx 0$. The formation of undistorted crystal particles having a length L leads to the appearance of spots on the Debye lines known as "pinholes". The value of L is found to be affected by the geometric conditions under which the X-ray pictures are taken. The intensity of pinholes depends largely on the size of the nuclei of recrystallization. Annealing time and temperature are decisive factors in the rate of formation of these nuclei (see Fig. 1 of the Enclosure). Orig. art. has: 7 figures, 1 table and 6 formulas.

ASSOCIATION: Institut metallofiziki AN Ukr.SSR (Metal physics institute, AN UkrSSR)

SUBMITTED: 05Jul63   ENCL: 01   SUB CODE: MM
 NO REF SOV: 012   OTHER: 016
Card   2/3

L 23805-65   EWT(m)/T/EWP(t)/EWP(b)   IJP(c)   JD

ACCESSION NR: AP5001554

8/0185/64/009/012/1345/1350

AUTHOR: Larikov, L. N.; Yurchenko, Yu. F.

TITLE: Mechanism of natural aging of alloys of lead with cadmium

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 9, no. 12, 1964, 1345-1350

TOPIC TAGS: lead alloy, natural aging, two phase structure, heterogeneous decay, lamellar nodule, two phase precipitation, heterogeneous precipitation

ABSTRACT: The change in the structure and in the physical properties occurring during the course of natural aging of lead alloys with 1, 2, and 3 wt.% Cd were studied by x-ray diffraction, microscopic, calorimetric, and dilatometric methods. The x-ray measurements were made with an RKE camera and an URS-50I x-ray diffrac-tometer. The microstructure study was by the method of Turnbull and Treaftis (Transactions AIME v. 212, 33, 1958) and a Calve type calorimeter was used (E. Calve and A. Pratt, Microcalorimetry [Translation] M., IL, 1963). The dilato-meter with inductive pickup was described by the authors elsewhere (Voprosy fiziki metallov i metallovedeniya [Problems of Metal Physics and Metallurgy], Kiev, AN UkrSSR, No. 20, 1964). A "two-phase" type of precipitation is noted in

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L 23805-65

ACCESSION NR: AP5001554

the aging of the alloy with 1% Cd, wherein two systems of lines in the x-ray pattern correspond to the initial and reduced concentrations of Cd in the solid solution. At the same time, growth of lamellar nodules occurs on the grain boundaries. The aging process occurs by heterogeneous precipitation according to Geisler's scheme (Phase Transformations in Solids, New York, 1951, p. 387-- 535). During the aging of alloys with 2 and 3% Cd, the initial hardening is ac- companied by emission of heat, reduction of volume, and a two-phase change in the parameter of the matrix crystal lattice. The heterogeneous precipitation devel- ops principally after the disappearance of the x-ray interference lines corres- ponding to the initial concentration of the solid solution. Absence of a con- nection between the two-phase change in the parameter and the growth of the lamellar nodules is also found in other systems (Fe-C, Ni-Ti, Ni-Be, Cu-Ni-Co). It is concluded that the identification of the two-phase mechanism with the heterogeneous precipitation, as is customary in the literature, is not sufficient- ly well founded and the presence of two systems of x-ray values is not a neces- sary attribute of heterogeneous decay. Orig. art. has: 5 figures.

ASSOCIATION: Instytut metalofizyky AN URSR, Kiev (Institute of Metal Physics, AN UkrSSR)

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L 23805-65

ACCESSION NR: AP5001554

SUBMITTED: 16Apr64   ENCL: 00   SUB CODE: MM, SS

NR REF SOV: 010   OTHER: 007

Card 3/3

LARIKOV, L.N.; YURCHENKO, Yu.F.

Calorimetric investigation of thermal effects during the tempering
of hardened steel. Sbor.nauch.trud. Inst. metallofiz. AN URSR
no.19:87-94 '64.

(MIRA 18:5)

LARIKOV, L.N.; PETROV, Yu.N.; BORIMSKAYA, S.T.

Investigating structural changes with a two-phase mechanism of decay in a nickel-beryllium alloy. Sbor.nauch.trud. Inst. metallofiz. AN URSR no.19:148-154 '64.

(MIRA 18:5)

LARIKOV, L.N.; MAKSIMENKO, Ye.A.

Kinetics of the anomalous growth of austenitic grains in steel.
Sbor.nauch.trud. Inst. metallofiz. AN URSR no.19:187-191 '64.

(MIRA 18:5)

LARIKOV, L.N.; ZASIMCHUK, Ye.E.

Experimental methods of studying the kinetics of recrystallization
in metals. Sbor.nauch.trud. Inst. metallofiz. AN URSR no.19:219-231
'64.   (MIRA 18:5)

LARIKOV, L.N.; YURCHENKO, Yu.F.

Investigating thermal and volumetric effects during the
annealing of cold-worked patented steel. Sbor. nauch. trud.
Inst. metallofiz. AN URSR no.20:64-66 '64.

Methods of investigating small volumetric changes. Ibid.:
191-197   (MIRA 18:5)

L 29790-66   EWT(m)/T/EWP(t)/ETI   IJP(c)   JD/HW/GD

ACC NR: AT6016345   (N)
                                    SOURCE CODE: UR/0000/65/000/000/0075/0079

AUTHORS: Larikov, L. N.; Yatsenko, T. K.; Chernaya, L. F.; Kumok, L. M.   37

ORG: Institute for Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR) B+I

TITLE: Investigation of the diffusion of nickel in the system $Ni_3Al—Ni_3Ti$

SOURCE: AN UkrSSR. Podvizhnost' atomov v kristallicheskoy reshetke (Mobility of atoms in crystal lattice). Kiev, Izd-vo Naukova dumka, 1965, 75-79

TOPIC TAGS: nickel alloy, aluminum alloy, titanium alloy, metal diffusion, nickel

ABSTRACT: The rate of diffusion of Ni^{63} in the system $\gamma-Ni_3Al—\eta-Ni_3Ti$ was studied. The alloys were prepared in an induction furnace. The composition of the alloys, determined by means of chemical and x-ray analysis, was found to be in good agreement with the results of A. Taylor and R. W. Floyd (J. Inst. Metals, 1952, 80, 577). The diffusion coefficient was determined with the formula of P. L. Gruzin (DAN SSSR, 1952, 66, 289),

$$D = \frac{1}{4\,tg\,\alpha},$$

where D is the diffusion coefficient, $tg\,\alpha$ is the slope of the curve log N vs x^2 of the residual activity N at a depth x. The experimental results are presented in graphs and tables (see Fig. 1). The degree of order in $\gamma-Ni_3Al$ was also determined

Card 1/2

L 29790-66

ACC NR: AT6016345

Fig. 1.   Temperature dependence of the alloy
          diffusion coefficients.
          1 - Ni_3Ti; 2 - Ni_3Al; 3 - 5% Ti;
          4 - 15% Ti; 5 - 10% Ti.
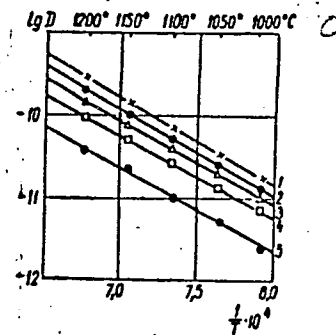
by x-ray methods. From a comparison of diffusion and x-ray data for the system
γ -Ni_3Al, it is concluded that there exists a qualitative correspondence between
the mobility and long-range order of the atoms of the principal metal. Orig. art.
has: 1 table, 2 figures, and 1 equation.

SUB CODE: 11/ SUBM DATE: 04Jan65/ ORIG REF: 008/ OTH REF: 006

Card 2/2

L 32609-66   EWT(m)/T/EWP(t)/ETI   IJP(c)   JD/HW/JG/GD

ACC NR: AT6010587   SOURCE CODE: UR/0000/65/000/000/0118/0126

AUTHOR: Larikov, L.N.; Zasimchuk, Ye. E.; Semenenko, M.N.

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

TITLE: Recrystallization kinetics in highly deformed nickel and niobium single crystals

SOURCE: AN UkrSSR. Fazovyye prevrashcheniya v metallakh i splavakh (Phase transformations in metals and alloys). Kiev, Naukova dumka, 1965, 118-126

TOPIC TAGS: niobium, nickel, metal recrystallization, crystal deformation, single crystal

ABSTRACT: Recrystallization kinetics were studied in a nickel single crystal 80% deformed by rolling in the <100> plane and in a niobium single crystal 90% deformed by rolling in a plane close to <102>. In the case of nickel, recrystallization anneals were carried out at 288, 313, and 334C during 20 min to 6 hr. The rate of formation of recrystallization centers N was determined by differentiating the dependence N + $f(\tau)$, where N is the number of re-crystallization grains per unit area of the polished specimen. The dependence of the maximum size of recrystallized grains on the annealing time and the temperature dependence of the growth rate G of the grains were determined. The recrystallization anneals of the niobium crystal were carried out at 965, 1005, and 1040C. In niobium, the recrystallization centers etch to the same extent as the single-crystal matrix. The parameters governing the generation of recrystallization centers were measured. The growth of these centers is

Card 1/2

L 32609-66

ACC NR: AT6010587

characterized by the presence of a short incubation period, as in the nickel single crystal.
Orig. art. has: 12 figures and 1 table.

SUB CODE: 20, 11 / SUBM DATE: 29Sep64 / ORIG REF: 005 / OTH REF: 002

Card   2/2

L 65041-65   EWT(m)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c)   IJP(c)   JD/HW

ACCESSION NR: AP5020692   UR/0185/65/010/008/0899/0905

AUTHOR: Larikov, L. N.; Zasymchuk, O. E. (Zasimchuk, Ye. E.); Kutikhina, Zh. Ya.

TITLE: The effect of recovery on the recrystallization kinetics of deformed metals

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 8, 1965, 899-905

TOPIC TAGS: copper, nickel, molybdenum, niobium, tungsten, single crystal metal, polycrystalline metal, cold worked metal, metal recovery, metal recrystallization

ABSTRACT: The effect of low-temperature annealing on the course of recrystallization has been investigated. Single-crystal and polycrystalline copper and nickel were deformed heavily (80—85% reduction by rolling) or lightly (4—7% reduction by bending), and Mo, Nb, and W single crystals were deformed only lightly. The preannealing of lightly deformed Cu single crystals was done at 470—750C (400C for nickel) and the recrystallization annealing at 900C (600C for nickel); for heavily deformed Cu single crystals, the corresponding temperatures were 100—150 and 170C (100—200 and 320C for polycrystalline nickel). The experiments showed that preannealing of strongly deformed single-crystal and polycrystalline Cu and Ni had no effect on the recrystallization kinetics. In lightly deformed single crystals and polycrystals (especially in the latter after a very small deformation) the recovery caused by

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L 65041-65

ACCESSION NR: AP5020692   3

preannealing delayed or in some cases completely inhibited subsequent recrystalli-
zation. The delay or inhibition of the recrystallization of the investigated metals
was found to be associated not with vacancies recovery but with grain polygonization.
Single crystals of metals with a bcc lattice (Mo, Nb, and W), after deformation of
30% or more in the plane of easy slip, exhibited no recrystallization with subse-
quent annealing because of the polygonization and stability of the polygonized
structure. Orig. art. has: 3 figures and 1 table.   [MS]

ASSOCIATION: Instytut metalofizyky AN URSR, Kiev (Institute of the Physics of
Metals, AN URSR)

SUBMITTED: 01Feb65   ENCL: 00   SUB CODE: MM, SS

NO REF SOV: 007   OTHER: 007   ATD PRESS: 4'8'4

L 40961-65   EWT(m)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c)   Pad   IJP(c)   JD/HW

ACCESSION NR: AP5006330   S/0126/65/019/002/0251/0256

AUTHOR: Larikov, L. N.; Zasimchuk, Ye. E.; Semenenko, M. N.

TITLE: Study of the recrystallization kinetics of weakly deformed nickel

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 2, 1965, 251-256

TOPIC TAGS: statistical microstructural method, recrystallization, recrystallization annealing, nickel, carbonyl nickel

ABSTRACT: The statistical microstructural method was used to study the rates of formation and growth of recrystallization centers as functions of the annealing time and temperature as well as kinetics of the change in the recrystallized area at annealing temperatures of 690, 730, and 780° C ($\pm 2°$ in each case) for carbonyl nickel (99.99%), 4.9 and 5.8% elongation-deformed. The relationships between the maximum size of the centers and the time for 5.8% deformation indicate that the recrystallization centers increase at a constant rate. In the temperature range studied the relationship between the rate of growth of the recrystallization centers (G) and the temperature is described by the simple exponential law

$$G = G_\circ \exp\left(-Q_G/RT\right). \qquad (2)$$

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L 40961-65
ACCESSION NR: AP5006330

The calculated temperature coefficient, Q_G, is approximately 46 kcal/g·atom. The experimental values for the rate of recrystallization center formation for the studied temperatures and degrees of deformation decrease in time under isothermal conditions. The results were correlated with the theories of recrystallization kinetics presented by Avrami and Cahn (Avrami, M. J., J. Chem. Phys., 1939, 7, 1103; 1940, 8, 212, 1941, 9, 177 and Cahn, R. W., Proc. Phys. Soc., 1950, A63, 323). Completely satisfactory results were obtained in correlation with Avrami's theory, but not with that proposed by Cahn. Orig. art. has: 6 figures, 1 table, and 10 formulas.

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

SUBMITTED: 21Jan64   ENCL: 00   SUB CODE: MM.

NO REF SOV: 007   OTHER: 010

Card 2/2

L 4880-66   EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c)   IJP(c)   JD

ACCESSION NR: AP5019834   UR/0181/65/007/008/2273/2275

AUTHORS: Beniyeva, T. Ya.; Larikov, L. N.; Polotskiy, I. G

TITLE: Effect of structure on Young's modulus and the damping decrement of aluminum

SOURCE: Fizika tverdogo tela, v. 7, no. 8, 1965, 2273-2275

TOPIC TAGS: aluminum, single crystal, Young modulus, crystal lattice structure, temperature dependence, vibration damping

ABSTRACT: The authors investigated the influence of crystal structure imperfections on the Young's modulus and damping decrement of cylindrical single crystals of 99.99 per cent pure aluminum, 100 mm long and 5 mm in diameter, grown by the Bridgman method. The temperature dependence of these parameters in different structural states was measured by a resonance method (L. G. Polotskiy and V. F. Taborov, Zav. lab. v. 8, 986, 1957) in the same sample. The results show that even in well annealed single crystals of aluminum Young's modulus is not a linear function of the temperature and that as the temperature

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L 4880-66

ACCESSION NR: AP5019834   3

is increased it depends essentially on the structure of the sample,
so that it cannot be used as an unambiguous characteristic of the
interatomic binding forces at temperatures exceeding half the melting
temperature. At relatively low temperatures, the damping decrement
depends little on the perfection of the sample structure and on the
amplitude of the strain. With increasing temperature, the decrement
begins to depend strongly on the amplitude and the amplitude-inde-
pendent part of the damping decrement begins to depend on the
structure. Orig. art. has: 2 figures.

ASSOCIATION: Institut metallofiziki AN SSSR; Kiev (Institute of Metal
Physics, AN SSSR)

SUBMITTED: 21Jul64   ENCL: 00   SUB CODE: SS, MM

NR REF SOV: 001   OTHER: 008

Card 2/2

LARIKOV, L.N.; ZASIMCHUK, Ye.E. [Zasymchuk, O.E.]; KUTIKHINA, Zh.Ya.

Effect of preliminary recovery on the recrystallization kinetics of deformed metals. Ukr. fiz. zhur. 10 no.8:899-905 Ag '65.

1. Institut metallofiziki AN UkrSSR, Kiyev.   (MIRA 18:8)

L 8937-66   EWT(1)/EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c)   IJP(c)   MJW/JD/JW/GG

ACC NR,   AP5027143

AUTHOR: Larikov, L. N.; Yurchenko, Yu. F.; Dubovitskaya, N. V.

UR/0126/65/020/004/0570/0573

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

TITLE: Investigation of recovery processes in the heating of steels in a high strength state

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 4, 1965, 570-573

TOPIC TAGS: recrystallization, steel, metal heat treatment

ABSTRACT: The article reports the results of a calorimetric, volumetric, x-ray, and electron microscope investigation of the nature of the recrystallization processes taking place during the heating of a cold rolled patented strip of U10 steel. Measurements made with a differential vacuum calorimeter during the continuous heating of samples (at a rate of approximately 2 degrees/min) have shown that the heating of the strip leads to a considerable evolution of heat. An investigation of the kinetics of the recovery of the

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UDC:621.785.3

L 8937-66

ACC NR: AP5027143

breadth of the x-ray interference line was made with a URS-50I
x-ray interferometer in the interval of intensive recrystalliza-
tion of the strip. The temperature dependence of the rate of
recovery of the breadth of the x-ray interference lines in the heat-
ing of a cold rolled patented strip cannot be expressed by a simple
exponential relation, since it varies substantially with a decrease
in the value of the microdeformations. This relationship can be ex-
pressed by an equation of the type

$$\frac{d\beta}{dt} \simeq \frac{d\varepsilon_t}{dt} = -C \exp\left(-\frac{W - A\varepsilon_t}{kT}\right), \qquad (2)$$

where W is the sum of the activation energy of autodiffusion and
the energy of formation of the dislocation thresholds. The samples
intended for electron microscope investigation were heated con-
tinuously at the same rate as those for the calorimetric tests. A
figure shows electron microscope photos of the most typical struc-
tures observed. The structure of the initial samples shows a con-
siderable dispersion of the carbide phase and of ferrite bands
after cold working of the patented strip. After annealing up to
360°, there is observed some increase in size of the structural
components which increases with further heating. The role of these
processes in the recrystallization of a steel strip during heating

Card   2/3

L 8937-66

ACC NR: AP5027143

is evidently substantial. "The authors express their thanks to G. V. Kurdyumov, M. D. Perkas and V. M. Kardonskiy for their interest in the work."/ Orig. art. has: 3 formulas and 4 figures.

SUB CODE: MM/   SUBM DATE: 17Dec64/   ORIG REF: 015/

OTH REF: 004

Card 3/3

LARIKOV, L.N.; YURCHENKO, Yu.F.

Mechanism of the recovery of the initial structure in the heating
of alloys aged according to a heterogenous mechanism. Fiz. met. i
-metalloved. 20 no.4:628-630 O '65.

(MIRA 18:11)

1. Institut metallofiziki AN UkrSSR.

L 37653-66   EWT(m)/T/EWP(t)/ETI   IJP(c)   JH/JD/JG

ACC NR: AP6017314 (N)

SOURCE CODE: UR/0126/66/021/005/0797/0799

AUTHORS: Borimskaya, S. T.; Larikov, L. N.; Plotnikova, N. P.

59
B

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

TITLE: Investigation of the weakening effect due to annealing in neutron irradiated single crystals of Al, Cu, and Mo

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 5, 1966, 797-799

TOPIC TAGS: metallurgic research, neutron irradiation, metal crystal, aluminum, copper, molybdenum, metal recrystallization, annealing

ABSTRACT: The effect of annealing on the strength of neutron irradiated single crystals of Al, Cu, and Mo was studied. The strength of the single crystals was assessed by means of microhardness measurements. The structural changes occurring during annealing were studied by x-ray techniques. The experimental procedure followed is described by V. M. Danilenko and G. Ya. Kozyrskiy (Sb. Voprosy fiziki metallov i metallovedeniya, No. 11, Kiyev, Izd. AN UkrSSR, 1960, str. 150), and V. P. Vertebnyy, M. F. Vlasov, V. V. Kolotyy, A. N. Maystrenko, and M. V. Pasechnik (Atomnaya energiya, 1962, 12, 4, 324). The experimental results are presented graphically (see Fig. 1), showing that none of the irradiated single crystals investigated undergoes recrystallization. It is concluded that the strengthening effect of neutron irradiation on the single crystals of Al, Cu, and Mo is not due to a recrystallization process.

Card 1/2

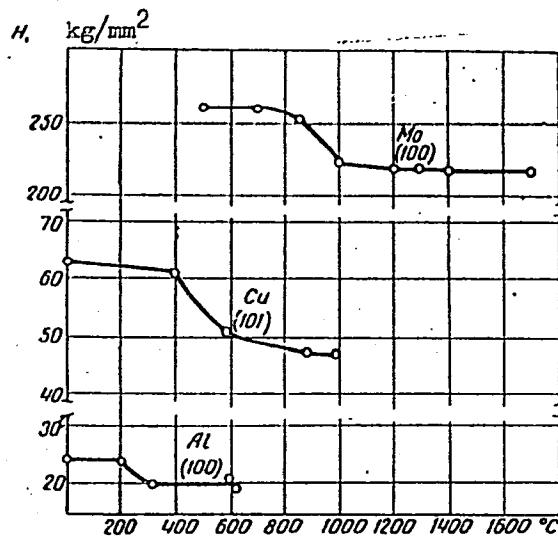UDC: 548.0:539

L 37653-66

ACC NR: AP6017314

Fig. 1. Change in the microhardness of irradiated single crystals of Al, Cu, and Mo as a function of the annealing temperature.

Orig. art. has: 3 figures.

SUB CODE: 11,20/SUBM DATE: 04Jan65/ ORIG REF: 007/ OTH REF: 004

Card 2/2

ACC NR: AT6036279   (A)   SOURCE CODE: UR/0000/66/000/000/0099/0104

AUTHOR: Kumok, L. M.; Larikov, L. N.; Maksimenko, Ye. A.; Yatsenko, T. K.

ORG: Institute of Metal Physics AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Structural changes produced by oxidation of chromium-yttrium alloys

SOURCE: AN UkrSSR. Struktura metallicheskikh splavov (Structure of metal alloys).
Kiev, Izd-vo Naukova dumka, 1966, 99-104

TOPIC TAGS: chromium yttrium alloy, metal oxidation, alloy structure, alloy oxidation
rate, oxidation kinetics

ABSTRACT: The oxidation behavior at 1100--1450C of 99.9%-pure chromium and
chromium-yttrium alloys containing 0.5, 1.0 or 2.0% yttrium has been studied.
It was found that yttrium improves the oxidation resistance of chromium and the
oxidation rate of all the alloys tested, especially that of the alloy containing 0.5%
yttrium (see Fig. 1), was much lower than that of pure chromium. On all the alloys
tested, a dense tightly adhering oxide layer was formed, while the oxide layer on
pure chromium easily peeled off. In pure chromium, a certain quantity of chromium
oxides and nitrides was formed to a depth of 650 μ in a metal oxidized at 1450C for
9 hr. In chromium-yttrium alloys, the amount of chromium oxides was much smaller

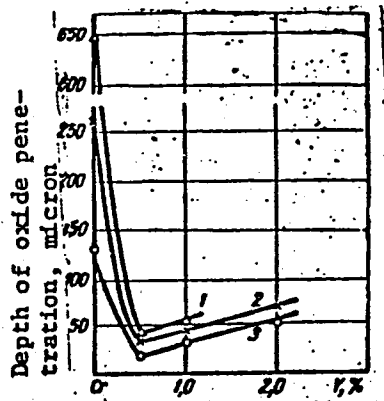Card 1/2

ACC NR: AP6036279

Fig. 1. Dependence of the penetration depth of oxides upon the yttrium concentration

1 —1450C for 9 hr; 2 —1400C for 20 hr; 3 —1350C for 30 hr.

and the nitrides were absent altogether. The penetration of oxygen and nitrogen into pure chromium proceeds mostly along the grain boundaries. This was not observed in the chromium-yttrium alloys. It is believed that yttrium improves the oxidation resistance of chromium primarily by a refining effect. Orig. art. has: 5 figures.

SUB CODE: 13, 11/ SUBM DATE: 11Jun65/ ORIG REF: 005/ OTH REF: 002/ ATD PRESS: 5107

Card 2/2

ACC NR: AT6034433   (A)   SOURCE CODE: UR/0000/66/000/000/0024/0027

AUTHOR: Larikov, L. N.; Zasimchuk, Ye. E.; Kutikhina, Zh. Ya.; Semenenko, N. M.

ORG: none

TITLE: Mechanism of softening of refractory metals

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 24-27

TOPIC TAGS: metal softening, refractory metal, electron radiation

ABSTRACT: The article gives the results of a study of the kinetics and mechanism of the softening of deformed single crystals of rhenium, tungsten, and molybdenum. The single crystals, obtained by the electron radiation method, were deformed by rolling along the slip planes. Rhenium and molybdenum were rolled at room temperature, and tungsten at a temperature of approximately 200°C. Rhenium and tungsten were annealed at temperatures of 2100 ± 20° and 1600 ± 10° (W), and molybdenum at 1070 ± 5°C. The softening of the crystals during annealing was estimated by the change in the microhardness. Based on the experimental data, a figure shows the dependence of the microhardness of rhenium, tungsten and molybdenum on the duration of isothermal annealing. The difference in the behavior of rhenium and the other refractory metals

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ACC NR: AT6034433

cannot be connected with differences in the melting points, since the melting point of rhenium is intermediate between the melting points of molybdenum and tungsten. The mechanism of the softening of deformed crystals is determined to a significant degree by the type of their crystal lattice. In the softening of metals with a densely packed lattice, recrystallization plays a large role. Metals with a body-centered cubic lattice are weakened to a large degree before recrystallization and, under particular recrystallization conditions do not recrystallize at all. It is shown that impurities and alloying elements exert an influence not only on the rate, but also on the role of the different physical processes in the softening of metals and alloys. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: 10Jun66/ ORIG REF: 012/ OTH REF: 002

Card 2/2

ACC NR: AT6034434   (A)   SOURCE CODE: UR/0000/66/000/000/0028/0030

AUTHOR: Larikov, L. N.; Chernaya, L. F.; Yatsenko, T. K.

ORG: none

TITLE: Autodiffusion in mono- and polycrystalline tungsten

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 28-30

TOPIC TAGS: metal diffusion, tungsten, electron radiation

ABSTRACT: The article reports an investigation of the volumetric and boundary autodiffusion of tungsten, using the radioactive isotope W^{185}. The study of volumetric autodiffusion was carried out on monocrystalline tungsten obtained by the electron radiation method. Diffusion annealing was done in the temperature interval 2430-2000°C in a Type TVV-4 furnace in an argon atmosphere. The diffusion coefficients were measured by the layer method, by measurement of the surface activity of the sample. A figure shows the temperature dependence of log D. This dependence can be described by the equation

$$D_{tot} = 25.12 \exp(151{,}000/RT)$$

The experimental data are also shown in detail in tabular form. Diffusion annealing

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L 04718-67   EWT(m)/EWP(v)/EWP(t)/ETI/EWP(k)   IJP(c)   JD/HM

ACC NR: AP6027429

SOURCE CODE: UR/0125/66/000/007/0008/0011

AUTHOR: Gretskiy, Yu. Ya.; Sterenbogen, Yu. A.; Grishchenko, R. N.; Kharchenko, G. K.; Larikov, L. N.; Fal'chenko, V. M.; Kumok, L. M.

ORG: /Gretskiy; Sterenbogen; Grishchenko; Kharchenko/ Institute of Electric Welding im. Ye. O. Patona AN UkrSSR (Institute elektrosvarki); /Larikov; Fal'chenko; Kumok/ Institute of Metal Physics AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Investigation of diffusion under variable heating conditions during diffusion welding

SOURCE: Avtomaticheskaya svarka, no. 7, 1966, 8-11

TOPIC TAGS: heat diffusion, diffusion welding, tracer study, titanium, iron

ABSTRACT: The possibility of using radioactive isotopes to determine the effect of variable short term heating on diffusion during diffusion welding was examined. Studies were conducted on titanium VT1 using cobalt-60 at welding temperatures in the range of $920-970^\circ C$. Evaluation of the autoradiographic method and of the method of removing layers of samples parallel to the plane of the weld and measuring their activity

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UDC: 621.791:536.12:532.72

L 04718-67
ACC NR: AP6027429

showed the latter to be suitable for determining diffusion coefficients
for short term (3-10 min) heating. The effect of variable heating
during diffusion welding on the diffusion parameters in Ti and Fe was
studied experimentally and with computer calculations. It was found
that the temperature variation in diffusion welding has insignificant
effects on diffusion parameters, hence diffusion coefficients obtained
under isothermal conditions may be used. Orig. art. has: 2 tables,
12 equations and 1 figure.

SUB CODE: 13, 20/ SUBM DATE: 16Mar66/ ORIG REF: 004/ OTH REF: 001
07/
Joining of dissimilar metals /8

Card 2/2

ACC NR: AP7001851   SOURCE CODE: UR/0021/66/000/012/1592/1593

AUTHOR: Larikov, L. N.; Fal'chenko, V. M.

ORG: Institute of the Physics of Metals, AN URSR (Instytut metalofizyki AN URSR)

TITLE: Effect of polymorphic transformation on the structure of thallium

SOURCE: AN UkrSSR. Dopovidi, no. 12, 1966, 1592-1593

TOPIC TAGS: thallium, thallium structure, thallium phase transformation, crystal orientation

ABSTRACT: The effect of $\alpha \rightleftarrows \beta$ transformation on the orientation of thallium α-modification has been investigated. Single-crystal thallium specimens were heated to 260C in an oil bath, held at that temperature for 10 min, and air cooled. X-ray diffraction patterns showed that the above heat treatment did not affect the structure of single crystals. The initial orientation of the thallium single crystal was preserved. Orig. art. has: 1 figure.

SUB CODE: 11, 20/ SUBM DATE: 08Jan66/ ORIG REF: 002/ OTH REF: 005

Card 1/1

ACC NR: AP7005754   (N)   SOURCE CODE: UR/0126/67/023/001/0101/0105

AUTHOR: Belyakova, M. N.; Borimskaya, S. T.; Zasimchuk, Ye. E.; Larikov, L. N.

ORG: Institute of Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR

TITLE: Kinetics of primary, cumulative and secondary recrystallization in molybdenum foil

SOURCE: Fizika metallov i metallovedeniye, v. 23, no. 1, 1967, 101-105

TOPIC TAGS: metal recrystallization, metal deformation, molybdenum, x ray diffraction analysis, crystal orientation / SRS type scintillation counter

ABSTRACT: The investigation was performed on Mo foil containing ~0.5% Ti and subjected to prior 80% deformation by rolling. The pole figure of the foil in deformed state (Fig. 1) was subjected to x-ray diffraction analysis, with hard radiation being recorded by means of a SRS type scintillation counter. Structure of the foil was examined with the aid of electropolishing in a mixture of methyl alcohol and sulfuric acid in the presence of a current density of 6 a/cm^2 with subsequent etching of the surface with a solution consisting of 1 part HNO_3 + +1 part HCl. The texture of the deformed foil is chiefly described by the orientation (100) [011] as well as (112) [110] with rotation through 4-6° with respect to the direction of rolling

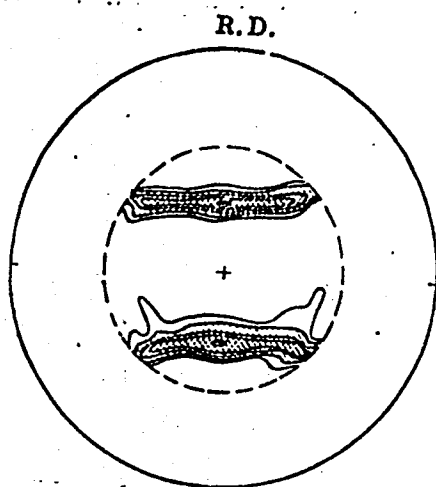Card 1/4   UDC: 669.28:548.5

R.D.

Fig. 1. Pole figure of molybdenum
foil in deformed condition

about the axis perpendicular to the rolling plane. The temperature dependence of the growth
rate of nuclei of primary recrystallization was investigated at 1050–1150°C. Subsequent anneal-
ing of the recrystallized foil at >2000°C led to its cumulative recrystallization -- gradual en-

Card 2/4

ACC NR: AP7005754

largement of grains. The texture of primary recrystallization is described by the same orien-
tations as the texture of deformation (Fig. 2) and is obtained from the texture of deformation by
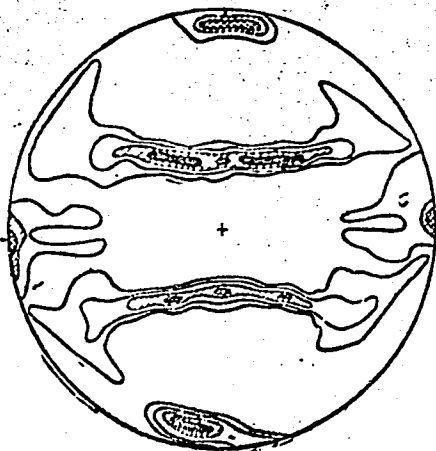
R.D.

Fig. 2. Pole figure of molybdenum foil in
recrystallized condition

rotation through 12-15° relative to the direction of rolling about the axis perpendicular to the
plane of the foil. The kinetics of the formation and growth of anomalous grains in the foil

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ACC NR: AP7005754

greatly resembles the kinetics of formation and growth of nuclei of primary recrystallization
in polycrystalline material. The texture of secondary recrystallization is described by the
orientation (100) [001] or (110) [001] depending on the annealing atmosphere. The shape of the
anomalous grains arising on annealing of molybdenum foil is evidently associated with the ori-
ginal metallographic texture of the deformed foil and with the characteristic distribution of im-
purities along the boundaries of the extended grains, such that grain growth in the direction
perpendicular to the direction of rolling is impeded. In thicker specimens which had not been
subjected to prior deformation by rolling the shape of anomalous grains was equiaxial.
Orig. art. has: 7 figures, 4 formulas.

SUB CODE: 20, 18/ SUBM DATE: 20Apr66/ ORIG REF: 008/ CTH REF: 008

Card   4/4

AUTHOR: Larikov, Ye. A.

TITLE: Relative Aperture, Magnification and Depth of the Photo-
graphed Space in a Wilson Chamber (Otnositel'noye otverstiye,
uvelicheniye i glubina fotografiruyemogo prostranstva kamer
Vil'sona)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, Nr 3, pp.105-106
(USSR)

ABSTRACT: A brief note giving simple formulae on the relation
between the geometrical factors of the chamber and the con-
ditions of illumination and photography, leading to good
resolution of the solvent drops in photographs of tracks
obtained with a Wilson chamber. There are 3 Russian refer-
ences.

ASSOCIATION: "Fizpribor" Works. (Zavod "Fizpribor")

SUBMITTED: December 16, 1959.

AVAILABLE: Library of Congress.

1. Cloud chambers-Applications

25(3)   SOV/146-2-5-16/19

AUTHOR: Larikov, Ye.A., Candidate of Technical Science

TITLE: Analytical Profiling of Flat Cams of Instrument
               Mechanism

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Priboro-
               stroyeniye, 1959, Nr 5, pp 106-110   (USSR)

ABSTRACT: The author proposes a new analytical method for
               profiling flat cams. This method was frequently
               used in the construction of various instruments.
               Two cases are considered: the calculation for a
               flat cam coupling with a spherical or roller-shaped
               feeler (Figure 1); and for a cam coupling with a
               flat feeler (Figure 2). It is shown that this
               calculation method is rather simple and can be
               easily applied. This article was recommended by
Card 1/2   the Kafedra "Pribory tochnoy mekhaniki" (The Chair
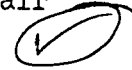
SOV/146-2-5-16/19

Analytical Profiling of Flat Cams of Instrument Mechanism

"Precision Instrument Mechanics"). There are
2 diagrams.

ASSOCIATION: Moskovskoye Ordena Lenina i Ordena trudovogo kras-
nogo znameni vyssheye tekhnicheskoye uchilishche
imeni N.E. Baumana (The Moscow School of Higher
Technical Education imeni N.E. Bauman, Order of
Lenin and the Red Labour Banner)

SUBMITTED: September 10, 1959

Card 2/2

LARIKOV, Ye.A., kand.tekhn.nauk, dotsent

"Precision instruments" by IU.M.Bogdanov. Reviewed by A.Larikov.
Priborostroenie no.10:31-32 O '61.   (MIRA 14:9)

1. Kafedra "Pribory tochnoy mekhaniki" Moskovskogo vysshego
tekhnicheskogo uchilishcha imeni Baumana.
    (Measuring instruments) (Bogdanov, IU. M.)

LARIKOV, Ye.A.

Rectification of scales and nonlinear relations in the manufacture
of instruments. Priborostroenie no.5:3-5 My '62.   (MIRA 15:5)
(Instrument manufacture)

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Solubility of isobutylene in triisobutylalumimum.
Khim.prom. no.9:561-562 Ag '62.   (MIRA 15:9)
        (Alumimum)   (Pentanone)

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B117/B186

AUTHORS: Antipin, L. M., Zhigach, A. F., Larikov, Ye. I., Popov, A. F.

TITLE: Study of the direct one-stage synthesis of triisobutyl
              aluminum

PERIODICAL: Khimicheskaya promyshlennost', no. 2, 1963, 17 - 20

TEXT: A study was made of how aluminum conversion during the one-stage
synthesis of triisobutylaluminum (TIBA) depends on the preceding activation
of aluminum as well as on the temperature and duration of the process. The
following Al powders were used: ПАК-3 (PAK-3) activated by TIBA, the
mechanically and chemically activated ПА-4 (PA-4) and non-activated powder
obtained by granulation in the inert-gas current. The experiments were made
at 50 - 60 atm in a hermetically sealed autoclave with a shielded drive for
the mixer. The device has been described earlier (A. F. Zhigach,
A. F. Popov, L. D. Vishnevskiy, L. M. Antipin, Khim. prom. no. 1, 24 (1962)).
The kinetic curves obtained show that when mechanically activated aluminum
is used hydration sets in after an induction period during which the in-
hibiting admixtures are removed from the Al surface. The activated Al
enters the reaction without inhibiting oxide layer. The reaction rate is
Card 1/3