SOV/109-4-8-6/35

Ignition of Discharges in the Non-uniform Fields at Low Gas Pressures

and the curves were taken for various depths h of the lower channel. The curves illustrating the breakdown voltages of configurations IV and V are given in Figures 5. From the investigation, it is concluded that, in non-uniform fields, when the two electrodes have a different shape, the breakdown voltage is strongly dependent on the polarity. Secondly, the breakdown voltage is determined not by the longest distance between the electrodes but by the length of that path which meets the condition of the self-maintenance of the discharge. The electrical strength of the discharge gap, as the pressure is reduced, is limited by the field-emission phenomena which appear at the cathode when the field reaches $E=200-500$ kV/cm.
There are 5 figures and 5 Soviet references; one of the references is translated from English.

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Ignition of Discharges in the Non-uniform Fields at Low Gas
Pressures

SOV/109-4-8-6/35

ASSOCATION: Vsesoyuznyy elektrotekhnicheskiy institut im.
        V.I. Lenina (All-Union Electrotechnical Institute
        imeni V.I. Lenin)

SUBMITTED: March 5, 1959

Card 4/4

GUSEVA, L.G.

66702

24,2/20

SOV/109-4-8-22/35

AUTHORS: Granovskiy, V.L., Luk'yanov, S.Yu., Spivak, G.V., and
Sirotenko, I.G.

TITLE: Report on the Second All-Union Conference on Gas
Electronics

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8,
pp 1359 - 1358 (USSR)

ABSTRACT: The conference was organised by the Ac.Sc.USSR, the
Ministry of Higher Education and Moscow State University.
It was opened by the chairman of the organising committee,
M.A. Leontovich, Academician. During the plenary sessions
of the conference, a number of survey papers were delivered.
L.A. Artsimovich read a paper on "Production of Ultra-high
Temperatures in Plasma".
A survey of the optical method of measurements was given
in the papers by V.A. Fabrikant and S.E. Frish.
S. Brown of the Massachusetts Institute of Technology
gave a survey of the high-frequency methods of the investi-
gation of stationary and non-stationary plasma (see p 1244
in this issue of the journal).
M.V. Fedorenko read a paper entitled "Ionisation and
Inelastic Scattering During Atomic Collisions".   X

Card/15
L.A. Senn and Yu.M. Kagan deal with "Elementary Processes
of Determining the Motion of Ions in Gas".
A paper by Ye. Badareu (Rumania) dealt with "The Role of
Resonance Recharging in the Kinetics of Ions".
I.S. Stakolnikov considered the initial stages of the
development of sparks (corona-leader, main channel and the
final channel).
B.M. Klyarfeld gave a survey of the ignition processes
of the discharges in highly rarified gases.
The mechanism of the breakdown of a high-vacuum gap was
elucidated in a paper by V.L. Granovskiy.
L. Tonks (USA) expounded a theory of the motion of
electrons in a magnetic trap (see p 1316 of this journal).
Academician R. Rompe (Eastern Germany) described a number
of experiments on non-stationary plasma conducted by
himself.
M. Steenbeck (Eastern Germany) gave a generalised theory of
plasma. The conference was divided into six sections.
The first section was presided over by L.A. Senn and was
concerned with the elementary processes in gas discharges.
The following papers were read in this section:
Ya.M. Fogel - "Transformation of Positive Ions Into
Negative Ones in Rarified Gases".
Ya. M. Fogel with V.A. Ankudinov and D.V. Pilipenko -
"Capture and Loss of Electrons During the Collision of
Fast Atoms of Carbon and Hydrogen with the Molecules of
Gases".
M.Y. Fedorenko et al. - "Dissociation of Molecular Ions
of Hydrogen During Collisions in Gas".
L.P. Pinks and Ya.I. Solovtyev - "Capture   Cross-section
of Electrons in Multicharge Ions in Inert Gases".
B.M. Kushnir et al. - "Experimental Investigation of the
Resonance Recharging in Certain Single-atom Gases and
Metal Vapours".
O.B. Firsov - "Qualitative Investigation of Inelastic
Collisions of Atoms".
L.M. Volkova - "Effective Excitation Cross-sections of the
Spectral Lines of Potassium and Argon".

Card/15
L.P. Zapesochnyy and S.M. Kishko "Some Results of the
Investigation of the Optical Functions of the Excitation
Bands of a Negative System".
A.A. Vorob'yev and A.G. Vlasov - "Investigation of the
Scattering of the Electrons in a Betatron Chamber".
The second section was presided over by B.M. Klyarfeld
and was devoted to the problems of the electrical break-
down in rarified gases and in high vacuum. The following
papers were read in this section:
G.Ya. Makar-Limanov and Yu.A. Metlitskiy - "Electrostatic
Control of the Ignition of Glow-discharge Tubes"(see
p 1274 of the journal).
S.V. Pitsyn et al. were concerned with the breakdown
in a high-voltage mercury rectifier (see p 1270 of the
journal).
L.G. Guseva "Ignition of the Discharges in Non-uniform
Fields at low Gas Pressures" (see p 1260 of the journal).
A.S. Soboleva and B.N. Klyarfel'd - "The Discharge Phenomena
Between a Point and a Plane at Gas Pressures of
10^-3 - 1 mm Hg".

AP4010309

AUTHOR: Guseva, L.G.

S/0048/64/028/001/0141/0146

TITLE: Influence of individual elementary processes on the characteristics of high voltage discharges /Report, Second All-Union Conference on the Physics of Electronic and Atomic Collisions held in Uzhgorod, 2-9 Oct 1962/

SOURCE: AN SSSR, Izvestiya. Seriya fizicheskaya, v.28, no.1, 1964, 141-146

TOPIC TAGS: high voltage discharge, discharge mechanism, electric breakdown, restitution coefficient, electron production, ionization, electron reflection, multiple ionization, electron multiplication

ABSTRACT: Many aspects of the mechanism of high voltage discharges is still obscure. It is often assumed that only two processes are significant where ignition of a discharge under the conditions corresponding to the left-hand branch of the Paschen curve are concerned, namely, ionization of the gas in the gap by primary electrons and gamma processes on the cathode. However, analyses carried out by the author indicate that these two processes alone do not satisfactorily explain the behavior of high voltage discharges. There must also be considered the contribution

Card 1/3

AP4010309

from ionization by positive-ions, charge exchange, additional ionization produced by electrons reflected from the anode and by electron ejected from the atoms of the gas in the process of primary ionization. The probable roles of these different processes in high voltage discharges are estimated by evaluating the electron restitution (multiplication) coefficients associated with these processes. Specifically, calculations are carried out for the coefficients connected with the ionization of the gas by the primary electrons, the ionization produced by electrons released from atoms ionized by primary electrons and ionization produced by electrons reflected from the anode. The values of the calculated electron restitution coefficients are tabulated for the cases of high voltage discharges in nitrogen and mercury vapor. It is concluded that the production of new electrons in the discharge gap due to reflection of electrons from the anode is often comparable to and sometimes greater than the effect of primary electrons. The fact that the effect of reflection of electrons from the anode may be significant in the ignition of high voltage discharges is also indicated by studies of the influence of the material of the anode on the breakdown voltage. "The author is grateful to Prof.B.N.Klyarfel'd for valuable advice and suggestions in the course of carrying out the investigation." Orig.art.has: 7 formulas, 3 tables and 2 figures.

Card 2/3

AP4010309

ASSOCIATION: Vsesoyuzny*y elektrotekhnicheskiy institut im.V.I.Lenina (All-Union
Electric Engineering Institute)

SUBMITTED: 00   DATE ACQ: 10Feb64   ENCL: 00

SUB CODE: PH   NR REF SOV: 005   OTHER: 007

Card 3/3

L 41242-65   E T(1)/EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EPR/EPA(w)-2/EHC(t)/EWP(t)/
EWP(b)/EWA(m)-2   Pab-10/Pr-4/Ps-4/Pu-4   IJP(c)   JD

ACCESSION NR: AP5005233   S/0057/65/035/002/0306/0311

AUTHOR: Klyarfel'd, V.N.; Guseva, L.G.

TITLE: On the nature of the positive current-voltage characteristic of a low pressure electric discharge

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.2, 1965, 306-311

TOPIC TAGS: gas discharge, glow discharge, plasma, low pressure discharge, helium, argon

ABSTRACT: High voltage discharges in helium and argon between plane carbonized iron electrodes were investigated experimentally and the results for helium at 0.08 mm Hg with 8 cm electrode separation are presented graphically. At low currents the potential remained constant at 4.6 kV, but when the current reached a certain threshold the potential increased and plasma could be observed in the vicinity of the anode. With further increase of current the plasma layer became thicker and the potential continued to rise. This increase in potential is ascribed to the effective decrease in the length of the discharge gap as more of the interelectrode space becomes occupied by essentially equipotential plasma. The thickness of the

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L 41242-65
ACCESSION NR: AP5005233

plasma at the anode and the potential drop were measured as functions of the pres-
sure for fixed current and electrode spacing. From the resulting curves the ratio
of the ion current to the electron current was estimated and found to be small.
From this it is concluded that the high voltage discharge with plasma at the anode
and the anomalous glow discharge are "qualitatively identical", differing only in
the ratio of the ion to the electron current. As this ratio increases the potential
drop approaches a limiting value. This is ascribed either to recombination in the
negative glow plasma or to a shift of the position of maximum potential in the an-
ode plasma toward the region of the cathode drop. "V.V.Vlasov, A.Ye.Kulikov and I.
Z.Shapiro participated in the experimental portion of the work." Orig.art.has:
4 figures.

ASSOCIATION: Vsesoyuznyy Elektrotekhnicheskiy institut im.V.I.Lenina (All-Union
Electrotechnical Institute)

SUBMITTED: 30Apr64   ENCL: 00   SUB CODE: ME,EM

NR REF SOV: 003   OTHER: 004

Card 2/2

L 28485-66   EWT(1)/EWT(m)/EWP(t)/ETI   IJP(c)   JD

ACC NR: AP6013126   SOURCE CODE: UR/0057/66/036/004/0704/0713

AUTHOR: Klyarfel'd, B.N.; Guseva, L.G.; Pokrovskaya-Soboleva,A.S.

ORG: All-Union Electrotechnical Institute im. V.I.Lenin,Moscow (Vsesoyuznyy elektrotekhnicheskiy institut)

TITLE: Glow discharge at low pressures and current densities up to 0.1 A/cm^2

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 704-713

TOPIC TAGS: glow discharge, hydrogen, nitrogen, neon, argon, gas discharge,plasma,

ABSTRACT: Current-voltage characteristics of glow discharges between plane parallel electrodes in H_2, N_2, Ne, and Ar have been measured at voltages from 0.2 to 30 kV, currents from 10^{-9} to 10 A, and values of the pd product (pressure times electrode distance) corresponding to the left-hand branch, the minimum, and a portion of the right-hand branch of the Paschen curve. The diameter of the electrodes was always greater than the distance between them, and care was taken to assure purity of the gases and to avoid distortion of the curves due to thermal effects. The high current discharges were pulsed, the data being recorded on the fall of the pulse. Measurements at intermediate currents by both the pulse and continuous techniques gave concordant results. Many of the recorded current-voltage characteristics are present graphically, and they are discussed at some length. Glow discharges are classified into three groups, for which there are proposed the following designations: Simple

UDC: 537.525

Card   1/2

L 28485-66

ACC NR: AP6013126

3

(or Simplest) Glow Discharge; Dense Glow Discharge; and Normal Glow Discharge. The simple glow discharges comprise the Townsend discharge; which is thus regarded as a kind of glow discharge, and the high voltage discharge; they are characterized by absence of space charge between the electrodes and a potential that is independent of the current over a very wide range. The dense glow discharges are characterized by increase of the voltage with increasing current, decrease of the voltage (at constant current) with increasing value of the pd product, and the presence beyond the cathode fall region of plasma, the potential of which is close to that of the anode and which exhibits a typical negative glow. In the normal glow discharge the potential is almost independent of the value of the pd product, the current density at the cathode is nearly independent of the current (and not proportional to it as in the simple and dense glow discharges), and a negative glow plasma fills only part of the inter-electrode region. As the current is increased at low pressures a simple glow discharge passes directly into a dense glow discharge; at higher pressures there is an intermediate range in which the glow discharge is normal. It is suggested that it may prove necessary to introduce further new terms to describe the still insuffici-ently investigated glow discharges for values of the pd product exceeding 100 mm Hg x cm. V.V. Vlasov, A.Ye.Kulikov, and A.T.Pavlova participated in the experimental work. Orig. art. has: 7 figures.

SUB CODE: 20   SUBM DATE: 16Jul65   ORIG. REF: 005   OTH REF: 008

Card 2/2

L 11006-66   EWT(1)/EWT(m)/T   DS

ACC NR: AP6018746   SOURCE CODE: UR/0057/66/036/006/1140/1143

AUTHOR: Udris, Ya. Ya.; Gusova, L. G.; Chornov, V. A.

ORG: All-Union Electrotechnical Institute im. V.I.Lenin, Moscow (Vsesoyuznyy elektro-
tekhnichoskiy institut)

TITLE: On some properties of a high voltage hollow anode glow discharge

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 6, 1966, 1140-1143

TOPIC TAGS: glow discharge, electric discharge, electrode, hollow anode, air,
inert gas

ABSTRACT: The authors have investigated high voltage (3 to 25 kV) glow discharges in
air and different inert gases at pressures from 0.001 to 0.1 mm Hg and currents from
0.0001 to 1 A between 6 to 35 cm diameter plane cathodes and plane or hollow anodes
of the same diameter (the hollow anodes were from 15 to 100 cm deep). The current
distribution on the plane end of a hollow anode was the same as on a plane anode, thus
confirming the conclusion of G. W. McClure (Phys.Rev., 124, 696, 1961) that the glass
tube confining the discharge in the case of plane electrodes becomes charged to ap-
proximately the anode potential and so gives rise to conditions approximating those
within a hollow anode. The discharge current was found to be focused onto the central
portion of the plane end of the hollow anode. The current to the cathode surface, on
the other hand, was not concentrated in the central region of the electrode, the

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L 41005-66

ACC NR: AP6018746   2

current density was actually somewhat lower in the center of the cathode than at some distance from the center. The focusing of the current on the anode and its defocusing on the cathode were enhanced by a longitudinal magnetic field. The enhancement of the current focusing due to the field of a short solenoid depended strongly on the axial position of the solenoid. Particles were withdrawn from the discharge region through holes in the electrodes. Difficulty was experienced with discharges through the openings in the electrodes when the pressure in the regions beyond the electrodes was the same as in the interelectrode region, but such discharges could be avoided by maintaining a low pressure in the regions beyond the electrodes. From measurements of the particles withdrawn from the discharge region through holes in the electrodes it was concluded, in agreement with the findings of McClure (loc.cit.) and D.Kamke and F.W.Richter (Ann. d. Phys., 10, 360, 1963), that 75-80% of the energy of the hollow anode discharge is carried by the electron current to the anode. The authors thank V.L.Granovskiy (deceased) and B.N.Klyarfel'd for valuable advice and discussions. Orig. art. has: 3 figures.

SUB CODE: 20,09/   SUBM DATE: 22Oct65/   ORIG.REF: 003/ OTH REF: 002

Card 2/2

1. GUSEVA, L.I.

2. USSR (600)

4. Moths

7. Some data on the biology of the moth, a raw fur pest. Trudy VNIO. no. 10, 1951.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

NESMEYANOV, A.N.;GUSEVA, L.I.;TIKHONOVA, L.I.;ZABORSKIY, A.K.

Chemical state of atoms resulting from nuclear transformations.
Dokl.AN SSSR 103 no.6:1041-1043 Ag '55.   (MIRA 9:1)

1.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
Predstavleno akademikom A.N.Frumkinym.
                        (Radiochemistry)

GUSEVA, L.I.

C-4

Category : USSR/Nuclear Physics - Structure and Properties of Nuclei

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3216

Author   : Guseva, L.I., Filippova, K.V., Gerlit, Yu.B., Druin, V.A.,
           Myasoyedov, B.F., Tarantin, N.I.
Title   : Experiments on Obtaining En and Fm with a Cyclotron.

Orig Pub : Atom. energiya, 1956, No 2, 50-54

Abstract : Report of production of transplutonian elements by bombarding U with
           nuclei of N and O. Quintupli-charged ions of N and sextuple-charged
           ions of O were accelerated with a cyclotron having a magnet with pole
           diameters of 150 cm. The transplutonian elements were separated by
           the fluoride method using La as a carrier. The half lives and the
           energies of the α particles were measured with the aid of photographic
           plates and an ionization chamber with a spherical electrode. The quin-
           tuple-charged ions of N were obtained in a specially developed slit-type
           source. The energy of the N ions at the maximum radius was 105 Mev, and
           the ion current was 5×10^{-7} amp. Irradiation of U by N ions produced
           the isotope En^{247}, identified by the value of T and by the energy of the
           α particles. Sextuple-charged O ions were obtained by "stripping"
           double-charged O ions on molecules of the residual gas in the cyclotron

Card   : 1/2

Category : USSR/Nuclear Physics - Structure and Properties of Nuclei   C-4

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3216

chamber. The maximum energy of the accelerated sextuple-charged ions
of O at the maximum radius was 120 Mev. The current of ions with
energies exceeding 100 Mev was 3×10^{-9} amp. The isotope Fm was ob-
tained by exposing U to ions of O and was identified by the value of T
and by the energy of the α particles. Several hundreds of atoms each
of isotopes of Cf, Bk, and Cm were separated by the chromatographic
method.

Card   : 2/2

GUSEVA, L I N

EXPERIMENTS ON THE CREATION OF EINSTEINIUM AND FERMIUM IN A CYCLOTRON. L. I. Guseva, K. V. Filipova, Yu. B. Gerlit, V. A. Druin, N. I. Tarantin. Soviet J. Atomic Energy, No. 3, 193-7 (1956).

The results are presented of some experiments on the creation of einsteinium and fermium by cyclotron irradiation of a uranium target with quintuply charged nitrogen ions (N V) and sextuply charged oxygen ions (O VI). The half lives and α-particle energies were measured with the aid of photographic plates, an ionization chamber with a spherical electrode, and a twenty-channel pulse-amplitude analyzer. The separation of transplutonic elements was performed by a chromatographic method. (auth)

GUSEVA, L. I.

Experiments on the production of einsteinium and fermium with a cyclotron. L. I. Guseva, K. V. Filippova, Yu. B. Gerlit, V. A. Druin, B. F. Myasoedov, and N. I. Tarantin. Atomic Energy (U.S.S.R.)(English translation) 1, No. 2 (Pub. in J. Nuclear Energy 5, 341-0(1958)).—By bombarding U with N⁵⁺ accelerated to 100 m.e.v., Em²⁵³ was obtained. It was identified by the half-life and α-particle energy. From a U target bombarded with 120-m.e.v. O⁶⁺ Em²⁵⁴ was prepd. and similarly identified. Several hundred atoms of Cf²⁴⁶ and Cf isotopes were prepd. chromatographically. — James L. Lauer

GUSEVA, L. L., FILIPOVA, K. V., FLEROV, G. N., GERLIT, Yu. B., MYASOEDOV, B. F. and TARANTIN, N. I.   (Acad. Sci. USSR)

"Mass Distribution of Fission Fragments Formated by Nitrogen Ions on Gold and Uranium Nuclei,"

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.
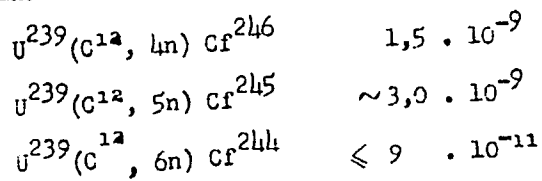
GUSEYA, L.I.

56-2-4/47

AUTHOR	GERLIT, Yu.B., GUSEVA , L.I., MYASOYEDOV,B.F., TARANTIN, N.I., FILIPPOVA, K.V., FLEROV, G.N.
TITLE	Yield of Californium Isotopes. Produced in the Interaction between Carbon Isotopes and Uranium Nuclei (Vykhody isotopov kaliforniya v reaktsiyakh vzaimodeystviya ionov ugleroda s yadrami urana. Russian)
PERIODICAL	Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 33, Nr 2 (8), pp 332 - - 342 (U.S.S.R.)

ABSTRACT   In a 67 cm cyclotron four-fold charged carbon ions are accelerated up to 9o MeV. With this energy they impinge upon a thick uranium target and cause the reaction U(C, n)Cf. The absolute yields per impinging carbon ion and the following reactions are:

$$U^{239}(C^{12}, 4n) \ Cf^{246} \qquad 1,5 \cdot 10^{-9}$$

$$U^{239}(C^{12}, 5n) \ Cf^{245} \qquad \sim 3,0 \cdot 10^{-9}$$

$$U^{239}(C^{12}, 6n) \ Cf^{244} \qquad \leqslant 9 \quad \cdot 10^{-11}$$

The fissioning of uranium bombarded with carbon was found to be $3,8 \cdot 10^{3}$ times more probable than the evaporation process of neutrons from the intermediary nucleus Cf^{250} .

Guseva L. I.

AUTHORS: Tarantin, N. I., Gerlit, Yu. B., Guseva, L. I.,   56-2-7/51
Myasoyedov, B. F., Filippova, K. V., Flerov, G. N.

TITLE: The Mass Distribution of Fission Products Produced by the
Irradiation of Gold and Uranium by Nitrogen Ions
(Raspredeleniye po massam produktov deleniya,
obrazuyushchikhsya pri obluchenii zolota i urana ionami
azota)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958,
Vol 34, Nr 2, pp 316-321 (USSR)

ABSTRACT: The present work investigates the mass spectrum of the
fission fragments of radon and einsteinium which are formed
in the irradiation of gold and uranium with nitrogen ions.
First the experimental method is discussed. Gold- and
uranium plates of a thickness of 30 µ were irradiated with
five-times charged nitrogen ions from a slit source at the
inner ray of an 150 cm cyclotron. The energy of the nitrogen
ions was 115 MeV. After the dissolution of the irradiated
target the different radioactive elements on the
corresponding carriers were dissolved. The radioactive

Card 1/3

The Mass Distribution of Fission Products Produced by the   56-2-7/51
Irradiation of Gold and Uranium by Nitrogen Ions

isotopes were identified according to their half life. The
relative yields of the nuclei identified this way are
listed in a table. A diagram shows the yields of the nuclei
given in this table as a function of the mass number A. The
main part of the yield of fission products is concentrated
within a comparatively narrow interval of mass numbers. The
yield of fission fragments increases rather greatly with an
increase of the mass number from 7o to 1oo, and with still
greater mass numbers it decreases to the same extent. From
the experimental values of the yields of single nuclei the
total yields of the corresponding mass series (massovaya
tsepochka) were computed. The additional taking into account
of the yields of nuclei not identified in these experiments
changes only little the character of the distribution of
experimental points. The curve of the distribution of
fission fragments in relation to the mass with the values
A = 85 to 115 has the shape of a narrow peak with a half
width of about 2o mass units. The yields of $Ga^{72,73}$, Se^{123},
Sb^{122} and the yields of the series of decays corresponding
to these nuclei do not coincide with the monotonous course
to these nuclei do not coincide with the monotonous course
of the curve and are a little greater as normal. About 2o

Card 2/3

The Mass **Distribution of** Fission Products Produced by the   56-2-7/51
Irradiation of Gold and Uranium by Nitrogen Ions

different isotopes were identified among the fission
products forming in the irradiation of uranium with nitrogen
ions. The yields of the accumulated nuclei are collected in
a table. The fission of nuclei under the action of heavy
particles can be represented by the following scheme:
Formation of a compound nucleus, emission of neutrons and
fission. The half width of the curve of the distribution of
fission fragments on the mass is considerably smaller in the
fission of radon than in the fission of einsteinium. There
are 2 figures, 2 tables, and 1o references, 4 of which are
Slavic.

SUBMITTED: August 2o, 1957

AVAILABLE: Library of Congress

1. Gold-Irradiation   2. Uranium-Irradiation   3. Nitrogen ions-
   Applications   4. Isotopes-Determination

Card 3/3

GUSEVA, L.I. (Moskva); OVECHKIN, B.I. (Moskva)

Atomic X-ray scattering on solid solutions of copper and nickel.
Izv. AN SSSR. Otd. tekh. nauk Met. i topl. no.2:82-85 Mr-Ap '59.
(MIRA 12:6)

(X rays--Scattering) (Copper-nickel alloys--Metallography)

SOV/78-4-9-38/44

5(2)
AUTHORS: Grigor'yev, A. T., Guseva, L. I., Sokolovskaya, Ye. M.,
             Maksimova, M. V.

TITLE: On Polymorphous Transformations of Chromium in Alloys With
             Tantalum

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2168-2169
             (USSR)

ABSTRACT: The cooling curve for liquid chromium determined by N. A. Nedumov
             (Ref 4) exhibits, in the vicinity of the very distinct maximum
             corresponding to the crystallization temperature, a second
             maximum which relates to the transition of chromium into another
             modification at 1815°. By means of microscopic, thermal, and
             X-ray analyses the chromium-tantalum alloy was investigated in
             the range rich in chromium after hardening; The location of the
             solidus and the limits of solubility of Ta in Cr were checked.
             1830° was found to be the temperature of transition between the
             modifications ε and δ . In contrast with the data obtained by
             N. Grant (Refs 1, 2) it was found that immediately after freezing
             chromium does not possess a face-centered but a cubic body-centered

Card 1/2

On Polymorphous Transformations of Chromium in   SOV/78-4-9-38/44
Alloys. With Tantalum

crystal lattice, which is in agreement with the fact that a
continuous series of solid solutions of chromium and σ'-iron
form. There are 1 figure and 4 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
Kafedra obshchey khimii (Moscow State University imeni
M. V. Lomonosov, Chair of General Chemistry)

SUBMITTED: January 12, 1959

Card 2/2

21(7)
AUTHORS: Volkov, V. V., Guseva, L. I., Pasyuk, A. S., Tarantin, N.I.,
              Filippova, K. V.

TITLE: The Production Cross Sections for Californium Isotopes by
              the Irradiation of U^{238} With Accelerated Carbon Ions
              (Secheniya obrazovaniya izotopov kaliforniya pri obluchenii
              U^{238} uskorennymi ionami ugleroda)

ABSTRACT: In the course of the irradiation of heavy elements with multi-
              charged ions compound nuclei are formed, which decay again
              as the result of fission or neutron evaporation. Important
              conclusions may be drawn with respect to new transuranium
              synthesis from the ratio of the two decay processes in depen-
              dence on the excitation energy and the parameters of the com-
              pound nucleus. In the present paper results obtained concern-
              ing the energy dependence of the cross sections of the reactions
              $U^{238}(C^{12}, 4n - 5n)Cf^{246-245}$
              $U^{238}(C^{13}, 5n - 6n)Cf^{246-245}$ (cf. also references 1-3)

Card 1/3   are discussed. The $^{+4}C^{12}$ and $^{+4}C^{13}$-ions were accelerated on

SOV/5C-3C-3-17/71

The Production Cross Sections for Californium Isotopes by the Irradiation of U^{238} With Accelerated Carbon Ions

the 15o cm cyclotron of the AS USSR up to 78 and 84 Mev respectively (with an accuracy of 3%). Energy measurement was carried out by absorption in aluminum, measurement of the ion flux on the target was carried out by means of an integrator (0.2 - 0.3 μa). The results obtained by these measurements are given in figures 1 and 2 in form of diagrams. Figure 3 shows the cross section of the reactions (C^{12}, 4n - 5n) and

(C^{13}, 5n - 6n) referred to the total production cross section for the compound nucleus in dependence on excitation energy. Each of the curves shows a characteristic maximum. The shifting of the maximum of the reaction (C^{12}, 5n) towards that of

the reaction (C^{13}, 5n) is assumed to be due to an inaccuracy of ion energy measurement. For the connection between the decay probabilities and the cross sections it holds that

$$\sigma_n = \sigma_t (\overline{W}_n / (\overline{W}_n + \overline{W}_f))^n$$

σ_n = total cross section of the neutron emission reaction in the case of a given energy. σ_f = cross section for the formation

Card 2/3   of a compound nucleus at the same energy. n = average number

SOV/56-36-3-17/71

The Production Cross Sections for Californium Isotopes by the Irradiation of U^{238} With Accelerated Carbon Ions

of emitted neutrons. W_n = probability of neutron emission. W_f = fission probability; ($\overline{W}$ denotes the mean value) $\overline{W}_n/\overline{W}_f$ for californium is $\sim 1/4$ and varies only little in the interval of the excitation energy of $35 - 55$ Mev. W_n/W_f for $Cf^{246}(4n - 5n)$ is $\sim 1/2$ and for $Cf^{246}(5n - 6n)$ $\sim 1/3$. The authors finally thank Professor G. N. Flerov for supervising work, and they also thank the cyclotron team under Yu. M. Pustovoyt and L. K. Tarasov for their collaboration in the chemical part of this work. There are 3 figures and 9 references, 5 of which are Soviet.

SUBMITTED: September 16, 1958

Card 3/3

GUSEVA, L.I.; MYASOYEDOV, B.F.; TARANTIN, N.I.; FILIPPOVA, K.V.

Cross sections of the formation of Cm^{240} by the radiation of Th^{232} with C^{12} and C^{13} ions. Zhur.eksp.i teor.fiz. 37 no.4: 973-977 O '59.   (MIRA 13:5)

(Curium--Isotopes) (Thorium--Isotopes)
(Carbon--Isotopes)

GUSEVA, L.I.

Obtaining female lines of cucumbers. Sbor. trud. asp. i mol.
nauch. sotr. VIR no.5:111-113 '64.   (MIRA 18:3)

Guseva, L.I.

Coprecipitation of nickel, manganese, thallium, and zinc with the metal sulfides of the hydrogen sulfide group. I. I. Alimarin, N. A. Rudnev, and L. I. Guseva. *Primenenie Mechenykh Atomov v Anal. Khim.* (*Akad. Nauk S.S.S.R., Inst. Geokhim. i Anal. Khim.* 1955, 18-23; cf. *C.A.* 47, 4698a.—Copptn. of these metals with members of the IV and V groups was studied with the aid of Mn^{56}, Ni^{65}, Zn^{65}, and Tl^{204}. Pptn. with H_2S was carried out in 0.3N acid solns. In the solns. contg. Ni there was 101 γ Ni and the Ni:M ratio was 1:58. The Mn solns. contained 111 γ Mn and the Mn:M ratio was 1:49. Ni and Mn copptd. only slightly with the sulfides, except in the cases of Bi_2S_3 and SnS_2 where copptn. of Ni was 1.24 and 2.86%, resp., and HgS and SnS_2 where copptn. of Mn was 1.6 and 1.5, resp., in the Tl-contg. solns. There was 2.96 γ and the Tl:M ratio was $1:6.95 \times 10^4$. Copptn. in these solns. was very high; copptn. was smallest with Ag_2S (28.0) and highest (96.0%) with HgS in solns. where the mol. ratio of Tl:M was 1:1 copptn. was appreciably smaller; in these solns. copptn. was smallest (1.9 and 2.0% with HgS and Ag_2S,

resp.) and highest (48.2%) with As_2S_3. The Zn solns. contained 560 γ of Zn and the Zn:M ratio was 1:12. When the H_2S was passed at the same rate as in the other expts. (50-60 bubbles/min.) copptn. of Zn was small and reached 7% with CdS and 10% with SnS_2. When the rate of H_2S passing was raised to 500 cc./min. the copptn. of Zn went up from 7.0 to 56.6% with CdS, from 10.0 to 47.7% with SnS_2, from 0.8 to 43.2% with HgS, and from 0.4 to 11.1% with Bi_2S_3. Copptn. with CuS, PbS, Ag_2S, As_2S_3, and Sb_2S_3 remained unaffected. Delay between pptn. and filtering caused more Zn to be pptd. with CdS. In changing the acidity between 0.05 and 0.4N the amt. of Zn copptd. with CdS and SnS_2 dropped with increasing acidity. M. Hooch

(2)

GUSEVA, L.I.

Sorption of some surface-active dyes by sulfides in the course of their aging. N. A. Rudnev and L. I. Guseva (V. I. Vernadskii Inst. Geochem. and Anal. Chem., Acad. Sci. U.S.S.R., Moscow). *Zhur. Anal. Khim.* **11**, 44-54 (1956).—The adsorption of a dye (neutral red) by freshly pptd. and aged metal sulfides was studied with the view of elucidating the structure of sulfide ppts. and the changes that they may undergo with time. Into a 150-ml. flask were added a soln. of the metal salt in such a quantity that the sulfide ppt. would be 0.1 g., HCl (1:1) to make it 0.3N, 10 ml. of 0.5% soln. of neutral red, and H_2O to a total vol. of 100 ml. The flask was placed in a thermostat at 28°, and after 10 min. H_2S was passed for 5 min. at approx. 500 cc./min. To the flask was then added 10 ml. H_2O satd. with H_2S and shaken for 20 min. After definite time intervals 3-5 ml. of soln. was centrifuged and the amt. of dye remaining was detd. colorimetrically. In another series of expts. the dye was added after pptn., in which case it was added after passing H_2S and in place of the 10 ml. H_2O satd. with H_2S. After 15 min. the highest adsorption was by As_2S_3, 97.2%; least by HgS, PbS, SnS_2, and Bi_2S_3, 46.6, 44.0, 48.8, and 50.0%, resp.; and in between were CdS, Ag_2S, and Sb_2S_3, 79.0, 58.2, and 60.4%, resp. With respect to time the sulfides were divided into 3 groups: the adsorption of dye by HgS, Bi_2S_3, Sb_2S_3, and SnS_2 increased with time; adsorption by CuS and Ag_2S decreased with time; and adsorption by CdS, PbS, and As_2S_3 remained practically the same. Adsorption by Hg, Cu, and As sulfides was not affected by the time when the dye was added. Thus, the aging of these sulfides is not affected by the dye. An increase or decrease in the amt. of dye adsorbed on aging is attributed to disaggregation or aggregation of the sulfide with time. An electron-microscope study of Ag_2S, SnS_2, CuS, As_2S_3, and Sb_2S_3 gels showed them to have a porous cellular structure. The structure of Ag_2S was denser than that of the other sulfides; PbS and CdS had a cryst. structure.

M. Hosch

AVRAMENKO, L.F.; VILENSKIY, Yu.B.; GUSEVA, L.K.; IVANOV, B.M.; POCHINOK,
V.Ya.; STEKLYANNIKOVA, Z.I.; FAYERMAN, G.P.

Stabilizing effect of thiazolotetrazoles and tetrazolobenzo-
thiazoles on silver chloride photographic emulsions. Zhur. nauch.
i prikl. fot. i kin. 5 no.4:294-295 Jl-Ag '60.   (MIRA 13:8)

1. Gosudarstvennyy universitet Kiyev, Filial Nauchno-issledovatel'-
skogo kino-fotoinstituta, Shostka i Institut kino-inshenerov,
Leningrad.
          (Photographic emulsions)   (Tetrazole)

BLINOVA, V.A.; PLOTNIKOVA, N.V.; VOLKOV, N.M.; SYSOYEVA, A.V.; AVDEYEV, P.P.;
     KATSEVMAN, Kh.A.; RODINA, P.M.; GUSEVA, L.L.; KAMENSKIY, V.I., red.;
     BYKOV, A.N., tekhn.red.

[Economy of Tambov Province; a statistical manual] Narodnoe khoziai-
stvo Tambovskoi oblasti; statisticheskii sbornik. [Tambov] Izd-vo
"Tambovskaia pravda," 1957. 187 p.   (MIRA 11:3)

1. Tabmovskaya oblast'. Statisticheskoye upravleniye. 2. Statisti-
cheskoye upravleniye Tambovskoy oblasti (for all except Kamenskiy,
Bykov). 3. Nachal'nik Statisticheskogo upravleniya (for Kamenskiy)
     (Tambov Province--Statistics)

GUSEVA, L.L., (Moskva)

Clinical picture of dystrophic myotonia. Klin.med. 36 no.9:93-97
S '58   (MIRA 11:10)

1. Iz nevrologicheskoy kliniki (zav. - prof. N.A. Popova)
Moskovskogo oblastnogo nauchno-issledovatel'skogo instituta imeni
Vladimirskogo.
              (MYOTONIA, ASTROPHICA, clin manifest.
                   (Rus))

GUSEVA, L.L.

Characteristics of massage in hemiplegia of vascular origin. Vop.
kur., fizioter. i lech. fiz. kul't. 26 no.4:312-315 Jl-Ag '61.
(MIRA 15:1)

1. Iz otdeleniya fizioterapii i lechebnoy fizicheskoy Kul'tury (zav.
dotsent N.P.Krylov) Moskovskogo oblastnogo nauchno-issledovatel'skogo
klinicheskogo instituta imeni M.F.Vladimirskogo.
        (PARALYSIS)   (MASSAGE)

GUSEVA, L.L., nauchnyy sotrudnik

Massage in spastic paralysis. Med. sestra 21 no.5:53-56 My '62.
(MIRA 15:5)

1. Iz kliniki nervnykh bolezney Moskovskogo oblastnogo nauchno-
issledovatel'skogo klinicheskogo instituta imeni M.F.Vladimirskogo,
Moskva.   (MASSAGE)   (PARALYSIS, SPASTIC)

SEMENOV, V.A.; GUSEVA, L.L.; SMIRNOVA, G.G.   (Moskva)

Clinical picture and morphology of defects of development of
the blood vessels of the spinal cord. Vop. neirokhir.26 no.5:
22-25 S-O'62   (MIRA 17:4)

1. Klinika nervnykh bolezney i patomorfologicheskogo otdela
Oblastnogo nauchno-issledovatel'skogo instituta imeni M.F.
Vladimirskogo, Moskva.

SEMENOV, V.A.; IOFFE, Yu.A.; GUSEVA, L.L.

Clinical aspects of Dercum's syndrome. Sov.med. 26 no.12:102-
106 D '62.
(MIRA 16:2)

1. Iz kliniki nervnykh bolezney (zav. K.M. Gorbacheva) Moskovskogo
oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta
imeni M.V. Vladimirskogo (dir. - zasluzhennyy vrach RSFSR P.M.
Leonenko).
(CORPULENCE)

SEMENOV, V.A.; GUSEVA, L.L.; IOFFE, Yu.A.

Clinical aspects of Melkersson-Rosenthal syndrome.
Zhur. nevr. i psikh. 62 no.2:273-276 '62.   (MIRA 15:6)

1. Klinika nervnykh boleznoy (zav. K.M. Gorbacheva)
Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo
instituta imeni M.F. Vladimirskogo.
            (PARALYSIS, FACIAL)   (EDEMA)
                    (TONGUE---DISEASES)

GUSEVA, L.L.

Exercise therapy in postinsult motor disorders. Vop. kur.,
fizioter. i lech. fiz. kul't 29 no.1:8-13 '64.

(MIRA 17:9)

1. Klinika nervnykh bolezney (zav.- prof. N.A. Popova) i
otdeleniye fizioterapii i lechebnoy fizicheskoy kul'tury
(ispolnyayushchiy obyazannosti zaveduyushchego Ye.O. Chernomordik)
Moskovskogo oblastnogo klinicheskogo instituta imeni M.F.
Vladimirskogo (dir. P.M. Leonenko).

STOYANOV, B.G.; GUSEVA, L.L.; IOFFE, Yu.A.

Meningeal phenomena in the Melkersson-Rosenthal syndrome.
Zhur. nevr. i psikh. 65 no.11:1659-1661 '65.   (MIRA 19:11)

1. Kafedra kozhnykh i venericheskikh bolezney (zaveduyushchiy - prof.
B.M.Pashkov) Moskovskogo meditsinskogo stomatologicheskogo instituta
(direktor - prof. S.I.Babichev) Ministerstva zdravookhraneniya RSFSR
i Klinika nervnykh bolezney Moskovskogo oblastnogo nauchno-issledovatel'-
skogo klinicheskogo instituta im. Vladimirskogo (direktor F.M.Leonenko).

STOYANOV, B.G.; SEMENOV, V.A.; GUSEVA, L.L.; IOFFE, Yu.A.

Melkersson—Rosenthal syndrome. Sov. med. 28 no.10:61-67
O '65.   (MIRA 18:11)

1. Kafedra kozhnykh i venericheskikh bolezney (zav.- prof.
B.M. Pashkov) Moskovskogo meditsinskogo stomatologicheskogo
instituta i klinika nervnykh bolezney (zav.- prof. F.A.
Poyemnyy) Moskovskogo oblastnogo klinicheskogo instituta
imeni Vladimirskogo (dir.- P.M. Leonenko).

GUSEVA, L.M,

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 6 (USSR)

AUTHORS: Pevzner, M.L., Guseva, L.M.

TITLE: The Formation of Magnetic Amalgams in the Amalgamation Process
        (Obrazovaniye magnitnykh amal'gam v protsesse amal'gamatsii)

PERIODICAL: Kolyma, 1957, Nr 7, pp 38-39

ABSTRACT: A study was made of the principles of formation of a magnetic
        amalgam. It was established that the cause of the formation of a
        magnetic amalgam is the medium. During internal amalgamation
        of the concentrates in vats without any CaO or NaOH (i.e., in an
        acid medium) and when Cu ions were present in the liquid portion
        of the pulp, a so-called "iron amalgam" formed which, in addition
        to an Au amalgam, contained a considerable quantity (up to 50%)
        of amalgamated particles of copper-clad Fe, as a result of which
        the iron amalgam acquired magnetic properties. To avoid losses
        of the extracted metal the magnetic fraction had to be treated with
        HNO_3; the Fe scrap, which was obtained during the finishing
        treatment by the amalgams, had to be collected and treated separately.
        The CaO concentration in the liquid portion of the pulp was as high as
        0.15%.
                                                                    A.Sh.

Card 1/1

1. Amalgams—Magnetic—Formation   2. Amalgamation processes—Appli-
cations

GUSEVA, L.M.; SOKOLOV, B.K.; KRASIN, A.G.; LYSENKO, A.M.; MOROZOV, G.A.,
red.

[For high corn yields] Za vysokie urozhai kukuruzy. Novgorod,
Knizhnaia red.gazety "Novgorodskaia pravda," 1960. 59 p.
(MIRA 14:12)

(Corn (Maize))

VORONOV, B.G.; GUSEVA, L.M.

Spectrum analysis of deposited high speed steel. Avtom.
svar. 16 no.12:84-85 D '63.   (MIRA 17:1)

VORONOV, B.G.; GUSEVA, L.M.; KURDYUMOVA, A.M.; KRASNOPROSHIN, V.A.

Spectrum analysis of girth joints in high-alloy steel. Avtom.
svar. 17 no.4:94-95 Ap '64   (MIRA 18:1)

GUSEVA, L.N.

Phase transitions in alloys of chromium with tantalum and
niobium. Izv.AN SSSR.Neorg.mat. 1 no.10:1743-1746 O '65.

(MIRA 18:12)

1. Institut metallurgii A.A.Baykova, Moskva. Submitted July
5, 1965.

GUSEVA, L. N.

"Esophagogastro- and Esophago-Intestinal Anastomosis." Cand Med Sci,
Second Moscow State Medical Inst imeni I. V. Stalin, Moscow, 1954. (KL, No
3, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher
Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

GUSEVA, L.N., kandidat meditsinskikh nauk (Moskva, Gospital'nyy val, 5, korpus 17, kv. 86)

Morphologic examination of esophagogastric and esophagointestinal anastomosis following radical surgery for exophageal and cardial cancer [with summary in English p.157]. Vest.khir. 78 no.6:28-34 Je '57.   (MIRA 10:8)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (zav. - prof. B.V. Petrovskiy) 2-go Moskovskogo meditsinskogo instituta
(ESOPHAGUS, neoplasms
surg., morphol. of esophago-gastric & esophago-intestinal anastomosis)
(STOMACH NEOPLASMS, surg.
morphol. of esophago-gastric intestinal anastomosis in cancer of cardia)
(INTESTINES, surg.
morphol. of esophago-intestinal anastomosis in cancer of cardia)

BONDALEVICH, V.Ya.; GUSEVA, L.N.

Work of the White Russian Republic Surgical Society. Zdrav. Belor.
5 no.9:77 S !59.   (MIRA 12:12)
          (WHITE RUSSIA--SURGICAL SOCIETIES)

GUSEVA, L.N.

Sarcoma of retroperitoneal space in complete reverse location of the internal organs. Zdrav. Belor. 6 no.9:69 S '60.   (MIRA 13:9)

1. Iz kafedry fakul'tetskoy khirurgii (zaveduyushchiy - professor P.N. Maslov) Minskogo meditsinskogo instituta.
        (VICERA—ABNORMITIES AND DEFORMITIES)   (ABDOMEN—TUMORS)

GUSEVA, L.N.

        In the Society of Surgeons and Therapeutists. Zdrav. Belor. 6
        no. 10:68-69 O '60.   (MIRA 13:10)
              (WHITE RUSSIA—SURGICAL SOCIETIES)
                  (WHITE RUSSIA—THERAPEUTIC SOCIETIES)

GUSEVA, L.

Meeting of the Surgical Society. Zdrav. Bel. 7 no.5:71-72 My '61.
(MIRA 14:6)
(WHITE RUSSIA—SURGICAL SOCIETIES)

GUSEVA, L.N.

Nitritometric titration of some secondary amines with internal
indicators. Sbor. nauch. trud. TSANII 6:103-109 '64.
(MIRA 19:1)

1. Laboratoriya farmatsevticheskogo analiza (rukovoditel' - kand.
farm. nauk M.I. Kuleshova) TSentral'nogo aptechnogo nauchno-
issledovatel'skogo instituta.

KORNILOV, I.I. (Moskva); MINTS, R.S. (Moskva); GUSEVA, L.N. (Moskva);
        MALKOV, Yu.S. (Moskva)

Interaction of the NiAl compound with niobium. Izv. AN SSSR.
Met. no.6:132-136 N-D '65.   (MIRA 19:1)

1. Submitted July 30, 1964.

L 63497-65   EPF(c)/EPF(n)-2/EWA(c)/EWT(m)/EWP(b)/T/EWP(t)   IJP(c)   JD/JG

ACCESSION NR: AP5018921

UR/0363/65/001/006/0880/0884
546.3-19-76-88:539.26

AUTHOR: Guseva, L. N.; Mariyengof, L. B.

TITLE: X-ray diffraction analysis of the Cr-Ta system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 6, 1965, 880-884

TOPIC TAGS: alloy, heat resistant alloy, chromium alloy, tantalum containing alloy, chromium tantalum system, system phase diagram, alloy phase composition, alloy structure

ABSTRACT: Chromium-tantalum alloys with a tantalum content of 1—50 at% were levitation melted from >99.97%-pure Cr and >99.9%-pure Ta in purified helium and studied by x-ray diffraction and microstructural analysis. The phase diagram of the Cr-Ta system (see Fig. 1 of the Enclosure) was plotted on the basis of obtained data. It was found that the maximum solubility of Ta in Cr is 5.2 at% at eutectic temperature, and drops to less than 1 at% Ta at 1400C. About 13 at% Cr dissolves in Ta. Solubility decreases with decreasing temperatures. The existence of two modifications of TaCr2 compound was confirmed: the high-temperature modification with a hexagonal struc-

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L 63497-65

ACCESSION NR: AP5018921   3

ture of the MgZn$_2$ type, and the low-temperature modification with a cubic structure
of the MgCu$_2$ type. The high-temperature modification dissolves Ta and forms a single
phase region in the range 33—42 at%. Below 1400C, TaCr$_2$ compound transforms to a
cubic structure of the NiTi$_2$ type. Orig. art. has: 3 figures and 2 tables.   [AZ]

ASSOCIATION: Institut metallurgii im. A. A. Baykov (Institute of Metallurgy)

SUBMITTED: 06Feb65   ENCL: 01   SUB CODE: MM, OP

NO REF SOV: 003   OTHER: 007   ATD PRESS: 4073
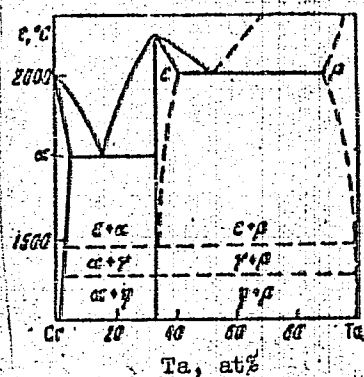
Card 2/3

Fig. 1. Phase diagram of the
Cr-Ta system

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49-6-18/21

AUTHORS: Shifrin, K. S. and Guseva, L. N.

TITLE: Forecasting of the natural illumination intensity.
         (Prognoz yestestvennoy osveshchennosti)

PERIODICAL: "Izvestiya Akademii Nauk, Seriya Geofizicheskaya"
         (Bulletin of the Ac.Sc., Geophysics Series), 1957, No.6,
                  pp. 827-830 (U.S.S.R.)

ABSTRACT: It is now known that the regime of the natural illumination
         intensity is independent of the geographical latitude of the
         observation point. According to data published by
         Sharonov, V.V. (1) and particularly data published by
         Barteneva, O.D. and Guseva, L.N. (2), the natural intensity
         of illumination in a given point is an unequivocal
         function of the height of the Sun and the degree of cloudi-
         ness, i.e. it depends only on the character and intensity
         of the flux irradiating the lower layers of the atmosphere.
         The changes in natural illumination intensity caused by
         fluctuations by the transparency of the atmosphere are
         smaller than the accuracy of observations of the illumination
         intensity. Therefore, it is possible to forecast the
         illumination intensity by utilising the existing scheme
         of forecasting cloudiness. The aim of this paper is to
Card 1/3 develop a method of forecasting of the local illumination

49-6-18/21

Forecasting of the natural illumination intensity. (Cont.)

intensity on the basis of cloudiness forecasts.   It is
thereby assumed that the success of the forecasting will
depend on the success of forecasting the cloudiness and
also on the probability of existence of the above mentioned
unequivocal relation between illumination intensity and
cloudiness.   The data given in Table 1 show that the
illumination intensity changes relatively little with
changes in the shape of the cloudiness for various cumulus
clouds.   On the basis of the data given in Table 1,
Table 2 gives data on the total illumination intensity in
terms of variations of the natural illumination intensity
between given limits of maxima and minima.   Table 3
contains data on the scattered light (illumination in the
shade) corresponding to seven forecasting classifications
of cloudiness.   On the basis of analysis of the data of
Table 2 and 3, it is stated that in the case of a clear
sky the fluctuations will be small and the total illumina-
tion intensity will increase from 5000 Lux for a height of
the Sun of 5° above the horizon and to 90 000 Lux for a
height of the Sun of 55° above the horizon.   The respective
values of the scattered illumination will be 3000 and

Card 2/3   40 000 Lux.   The author also mentions the work of

49-6-18/21

Forecasting of the natural illumination intensity. (Cont.)

Würner, H. (4) and states that Würner tries to circumvent the necessity of forecasting cloudiness and considers that that is not justified and that to be effective the method of Würner requires accumulation of illumination intensity data over many years for all the points of interest. There are 3 tables and 4 references, 3 of which are Slavic.

SUBMITTED: November 19, 1956.

ASSOCIATION: Chief Geophysics Observatory imeni A.I. Voyeykov. (Glavnaya Geofizicheskaya Observatoriya im. A.I.Voyeykova).

AVAILABLE: Library of Congress

Card 3/3

Guseva, L.N.

36-68-7/18

AUTHOR: Barteneva, O.D. and Guseva, L.N.

TITLE: The Effect of Meteorological Conditions on Natural
             Illumination. (Rezhim yestestvennoy osveshchennosti v
             zavisimosti ot meteorologicheskikh usloviy)

PERIODICAL: Trudy Glavnoy geofizicheskoy observatorii
                    1957, Nr 68, pp. 120-131 (USSR)

ABSTRACT: The article summarizes the results of observations on
             the interrelationship between natural illumination,
             degree of cloudiness and the elevation of the sun.
             It was found that the correlation between variations in
             total and scattered illumination remains constant for any
             latitude in Russia provided that the sun's elevation and
             the type of clouds are the same. Hence, the information
             obtained by V.V. Sharonov for the area of Slutsk is of
             a general nature and has been confirmed by observations
             made at Irkutsk, Tashkent, Yalta, Nikol'sk and Lisino.
             The article mentions Ya.A. Lopukhin and N.N. Kalitin.
             There are 8 diagrams, 3 tables, and 32 references, of
             which 27 are USSR.

AVAILABLE: Library of Congress

Card 1/1

ASHIROV, K.B.; GUBANOV, A.I.; SURGUCHEV, M.L.; GUSEVA, L.N.; OPURIN, N.V.;
YUGIN, L.G.

Geology and development of the Tarkhany oil field of the Oil Field
Administration of the Bugunuslan Petroleum Trust. Trudy Giprovo-
stoknefti no.3:165-182 '61.   (MIRA 14:12)
        (Bugurusian region--Oil reservoir engineering)

ASHIROV, K.B.; GUBANOVA, A.I.; SURGUCHEV, M.L.; GUSEVA, L.N.; OPURIN,
   N.V.; YUGIN, L.G.

Geology and development of the Tarkhany field of the Oil
Field Administration of the Buguruslan Petroleum Trust. Trudy
Giprovostoknefti no.3:165-182 '61.   (MIRA 16:7)

   (Buguruslan region--Oil reservoir engineering)

ASHIROV, K.B.; GUBANOV, A.I.; GUSEVA, L.N.; OPURIN, N.V.; YUGIN, L.G.

Geology and flow diagrams of the development of the Alakayevka
field. Trudy Giprovostoknefti no.5:197-208 '62.   (MIRA 16:8)

(Kuybshev Province—Petroleum geology)

ASHIROV, K.B.; GUBANOV, A.I.; GUSEVA, L.N.; OPURIN, N.V.; SHABANOV, V.A.

Geology and oil potential of Devonian layers in the Mikhaylovskoye-
Kokhany field and basic prerequisites for its development.
Trudy Giprovostoknefti no.5:209-221 '62.   (MIRA 16:8)

(Kinel'-Cherkassy District—Oil reservoir engineering)

ASHIROV, K.B.; GUBANOV, A.I.; GUSEVA, L.N.; OPURIN, N.V.

Practice in the development of the pool in the layer B_2 of the Radayevskoye field. Trudy Giprovostokmefti no.5:240-256 '62.
(MIRA 16:8)

(Kuybyshev Province--Oil reservoir engineering)

GUSEVA, L. N.

Physico-Chemical Investigation of Ferro-Silicon. N. V. Ageev, N. N. Kurnakov,
L. N. Guseva and O. K. Konenko-Gracheva. (Metallurg, 1940, No. 1, pp. 5-12). (In Russian).
The authors describe an investigation of the physical properties of ferro-silicon. Alloys
with silicon contents of 43.5-66.0% were prepared by melting, casting into heated moulds
and cooling slowly to avoid cracking. In alloys with 43-53% of silicon, the structure
consisted of FeSi dendrites against a background of large elongated crystals of the ζ-phase.
The structure suggests that the ζ-phase is formed by a peritectic reaction between the
molten alloy and the ε-phase. Alloys annealed for seven days at 950° C. showed decompo-
sition of the ζ-phase into a eutectoid type of phase. Commercial 45% ferro-silicon had a
peritectic structure made up of crystals of the ε-phase surrounded by the ζ-phase.
Measurements of the electrical resistance and the temperature coefficient of electrical
resistance of cast ferro-silicon showed no anomalies. The ζ-phase has a higher electrical
resistance than the ε-phase. Microscopic and X-ray examination show that the ζ-phase has
a homogeneity range of 53-54.5% silicon. The crystal structure of this phase was determined.
The X-ray examination showed that on annealing the amount of the ζ-phase is reduced due to
decomposition into silicon, ε-phase and an unidentified phase.

PROCESSES AND PROPERTIES INDEX

X-Ray Investigation of the Aluminium-Rich Al Mg Cu Alloys. V. G. Kuznetsov and L. N. Guseva (*Izvest. Akad. Nauk S.S.S.R.* (*Bull. Acad. Sci. U.R.S.S.*), **1940**, [*Chim.*], (6), 905-928). [In Russian.] The Debye X-ray powder method, supplemented by microscopic examination, was used to determine the phases in aluminium-magnesium-copper alloys containing up to 50 wt.-% copper and 50 wt.-% magnesium. The X-ray powder method developed by Preston to measure the changes in lattice parameter was used to determine the solubility isotherms of magnesium and copper in aluminium at 445°, 400°, 300°, and 200° C.; the 500° C. isotherm was obtained by extrapolation. The same method was used to determine the boundaries of the phases adjoining the ternary solid solution at the above temperatures, the investigations being carried out with alloys having compositions situated along seven lines radiating from the aluminium corner. There are seven phase fields neighbouring on to the ternary solid solution region, namely : x + CuAl₂, x + CuAl₂ + L, x + L, x + L + T, x + T, x + T + Al₃Mg₂, and x + Al₃Mg₂, where L is the compound Al₆Cu₃Mg₄ and T is Al₂CuMg₄. When the temperature is lowered to 200° C. the two-phase regions shrink, while the three-phase regions, especially the x + T + Al₃Mg₂ region, expand. In alloys of the Duralumin type (small iron content), it is the CuAl₂ and Al₂Cu₃Mg₄ compounds that are responsible for precipitation-hardening. The maximum effect should be obtained in alloys with up to 0.8% magnesium and 3.0-4.2% copper on quenching from 500° C.—A. B.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

Distribution of the electron density in metallic aluminum. N. V. Ageev and L. N. Guseva (N. S. Kurnakov Inst. Gen. Inorg. Chem., Acad. Sci. U.S.S.R.)—*Bull. acad. sci. U.R.S.S., Classe sci. chim. 1943, 290* (in From data of James, Brindley, and Wood (cf. C.A. 26, 2851) and those of Brindley and Ridley (cf. C.A. 33, 8628), on the at. scattering factor F curve, and with the lattice const. 4.041 A., the electron d. distribution in the Al metal lattice has been calcd. by 3-dimensional Fourier series. Calcn. in the direction [100] at 20° yields neg. values of the d. owing to rupture of the series. By way of recalcn. of F for higher temp., the electron ds. were further computed, from 0.3 to 0.2 A., for [100], with the wave length Mo Kα, at 700° and 1000°, and with the wave lengths Fe Kα, Cu Kα and Mo Kα at 1000°. It was shown that at 1000° the neg. values disappear and the distribution becomes uniform; fluctuations of the electron d., still noticeable at 700°, vanish at 1000°; consequently, at that temp., rupture of the series has no effect. At still higher temp., 1500°, terms corresponding to higher-order reflections have values which fall within the limits of error; highest accuracy is thus obtained at the calcn. temp. of 1000°. Kα wave lengths of Fe, Cu, and Mo allow the calcn., resp., of 64, 168, and 700 terms of the series; it is consequently established that in view of a low calcn. temp. it is preferable to use the shortest wave lengths. With Mo Kα, calcn. temp. 1000°, the distribution curves were computed and plotted for the three directions [100], [111], and [110]. From these curves, the radius of the ion in the Al lattice was found to be about 0.85 A. In the space between ions, the distribution is even. Comparison between the exptl. curves and the theoretical curves drawn for Al° and for Al⁺⁺⁺, leads to the conclusion that in the metal crystal lattice, Al is present as approx. Divalent ions.   N. Thon

Magnesium rich alloys of magnesium with aluminum and silver. I. Equilibrium diagram of the system Mg-Mg₄Ag-Mg₄Al. V. G. Kuznetsov and L. N. Guseva (N. S. Kurnakov Inst. Gen. Inorg. Chem., Acad. Sci. U.S.-S.R.). Bull. acad. sci. U.R.S.S., Classe sci. chim. 1945, 307-307. The alloys were prepd. from Mg with about 0.03% Fe and Si, chemically pure Ag and Al with 0.15% Fe and 0.05% Si. Phase diagrams were established by means of thermal analysis, micrography, and x-ray diffraction. Phases are designated in accordance with the notation used in the binary Mg-Ag and Mg-Al systems: the γ phase of Mg-Al based on the compd. MgₓAlᵧ is called γ₁ (Haughton's β₁), the γ-phase of Mg-Ag (Mg₄Ag) is γ. (Haughton's β₂). The triple solid soln. is δ (instead of α). The notation β is reserved to crystals of AgMg. On etching with alc. HNO₃ soln. contg. 2% HNO₃, the γ₁ phase appears darker than γ₁ which remains lighter throughout. Two-dimensional melting diagrams are given for three radial sections corresponding to const. ratios Ag:Al = resp. 1:4, 1:1 and 4:1, for (Ag + Al) from 0% to 50% (Mg from 100% to 50%). Microphotographs are given for 7% Ag, 28% Al, phases δ + (δ + γ₁) + (δ + γ₁ + γ₁); 19.2% Ag, 31.7% Al, δ + (δ + γ₁) + (γ₁ + γ₁ + δ); 10.77% Ag, 37.46% Al, γ₁ + (γ₁ + γ₁) + (γ₁ + γ₁ + δ); 24.43% Ag, 25.96% Al, δ + (δ + γ₁) + (δ + γ₁ + δ); 5.5% Ag, 5.5% Al, δ + (γ₁ + δ) + (γ₁ + δ + γ₁); 40% Ag, 10% Al, γ₁ + (γ₁ + δ) + (γ₁ + δ + γ₁). From these data, the liquidus surface consists of four fields, corresponding to sepn. of the ternary solid solns.: in Mg (δ), in Mg₄Al (γ₁), in Mg₄Ag (γ) and in MgAg (δ). In agreement with Haughton, the ternary Mg₄Ag (δ).

eutectic temp. is 405° ± 5°, the eutectic compn. Al 10%, Ag 28.0%, Mg 61%. The section Mg₄Ag - Mg₄Al is not a simple binary section. The cooling curves show three arrests. At 61° MgₓAg, the temp. of beginning crystn. drops to 425° and then rises to 501° at 82.5% Mg₄Ag. Thus, at 425°, the curves of beginning crystn. of γ₁ and γ₁ intersect. The second arrest at 437° (111° corresponds to simultaneous sepn. of two phases: γ₁ + δ at up to 44% Mg₄Ag, γ₁ + γ₁ at from 44% to 70%, and γ₁ + δ at from 70% to 82%. A third arrest at 405° ± 5°, compn. from 15 to 90% Mg₄Ag, corresponds to simultaneous sepn. of γ₁ + γ₁ + δ. The section Mg₄Ag-Mg₄Al₃ permits drawing the line of the peritectic transformation β + melt = γ₁ in the ternary system. It proceeds at the const. temp., 501° ± 3°. The line intersects the MgₓAg-Mg₄Al₃ plane at the compn. 82.5% Mg₄Ag, or 50.0% Ag, 5% Al, 42.5% Mg. The line of simultaneous sepn. of γ₁ and γ₁ intersects that plane at 37.5% Ag, 17% Al, 45.5% Mg, temp. 425°. Solid-phase boundaries were detd. by high-accuracy x-ray measurements and micrography, on samples homogenized and quenched at 380°, 300° and 200° in agreement with Haughton, the solid-phase diagram shows three single phase areas of the ternary solid solns. δ, γ₁ and γ₁, two two-phase areas δ + γ₁ and δ + γ₁, and one three-phase area δ + γ₁ + γ₁. Relative to Haughton's data, the phase boundaries are somewhat shifted in the direction of increased limiting concn. of the δ-solid soln. Comparison of the data for the equil. state with data obtained for the nonhomogenized alloys shows striking differences. In the equil. state, the boundary between the solid soln. δ and the two-phase areas is strongly ...

METALLURGICAL LITERATURE CLASSIFICATION

shifted to higher concns. in (Ag + Al) as compared with the nonequil. condition. At the ratio Ag:Al = 1:1, the homogeneous field in the equil. diagram includes compns. for which in the nonequil. state the ternary eutectic is ppd. Boundaries between the two-phase and the three-phase area are likewise strongly shifted in the same direction. Thus, at Ag:Al = 1:4, without equil., the boundary is situated at the temp. of the ternary eutectic at about 27% (Ag + Al); at equil., at as low as 300°, the whole section passes only through the area of the δ-phase into the two-phase area δ + γ₁. The boundary line between the two-phase and the three-phase areas disappears and the whole field is occupied by δ + γ₁. On this section, in the equil state, the three-phase region appears only at temp. about 200° and below; here the boundary line between δ + γ₁ and δ + γ₁ + γ₁ passed nearly parallel to the compn. axis. A third arrest in the cooling curve was only observed on nonequil. systems; at equil., the line corresponding to pptn. of the ternary eutectic is absent and the diagram appears as that of a binary system. As compared with Haughton's data, the boundary lines between the two-phase and the three-phase areas intersect the line of pptn. of the ternary eutectic, on the sections Ag:Al = 1:1 and 4:1, at, resp. 19.5% and 50% (Ag + Al), as against Haughton's 17% and 45%. As a consequence, the region of sepn. of three phases at the eutectic temp is somewhat narrower, that of δ + γ₁ somewhat broader.   N. Thon

GUSEVA, L. N.

PA 27/49T39

USSR/Chemistry - Nickel, Electron : 1sl Sep/Oct 48
Density

Chemistry - Density, Electronic Structure and
Density

"Experimental Study of Electron Density in
Crystals: No 3, Electron Density of Nickel,"
N. V. Ageyev, L. N. Guseva, Inst Gen and Inorg
Chem imeni N. S. Kurnakov, Acad Sci USSR, 9 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 5

Conducted experimental determination of the atomic
factor of diffusion in nickel by method of substi-
tuting an aluminum standard in cobalt and copper
radiations. Calculated electron density for six

27/49T39

USSR/Chemistry - Nickel, Electron   Sep/Oct 48
Density (Contd)

directions of the elementary nickel cell by method
of Fourier's triple series for calculated
temperature of 8,000°. Each atom of nickel is
joined with 12 close neighbors by "bridges" of the
increased electron density, which implies the
presence of exchanging forces between atoms.
Submitted 22 Sep 47.

27/49T59

Electron density of nickel. N. V. Ageev and L. N. Guervya. *Doklady Akad. Nauk S.S.S.R.* **59**, 65 (1948). Electron densities along several planes were calc'd. by three-dimensional Fourier series from the exptl. at. scattering factor curve obtained with finely cryst. Ni. by using Co and Cu radiation and converting to abs. values. with Al powder as standard. Each Ni atom is linked with its 12 nearest neighbors by bridges of higher electron d., 1 1 electrons cu. A., as compared with about 0.4 electrons cu. A. for the interionic space. The electron d. distribution in the (001) plane is shown.   N. Thon

A.S.M.·S.L.A.   METALLURGICAL LITERATURE CLASSIFICATION

C A

Experimental study of electron density in crystals. IV.
Electron density of NiAl. N. V. Ageev and L. N. Guseva.
Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1949,
225-33; cf. C.A. 43, 1981h; 42, 5757g.—Structure fac-
tors were detd. for an alloy of 67.85% Ni, i.e. close to
NiAl, homogenized 3 days at 1000°, crushed to a powder of
200 mesh, annealed 1 hr. at 800°, and washed with toluene,
resulting in an av. particle size of (3-6) × 10⁻⁴ cm., lattice
const. 2.881 A., d. 5.87. The electron d. was calcd. by
the methods described previously, for the calcn. temp. of
10,000°, in the directions: [001], min. 0.4 electrons/cu. A.
at 1.44 A.; [011] min. 0.2 at 2.00 A ; [111] min. 0.9 at
1.25 A. and at ~3.6; [111]½ max. 0.9 at 0.8-1.2 A.;
[001]½½ max. 7.3 at 1.44 A.; [110]½ max. 7.3 at ~2 A.
The electron d. contour map is given for the plane (011).
The electron d. is distributed nonuniformly. Bridges of
increased electron d. are seen between Ni and Al atoms,
and between Ni and Ni atoms, in the direction of the
shortest distance, 0.9 and 0.4 electron/cu. A., resp., being
attained. The min. electron d., 0.2 electron/cu. A., is
found between Al and Al atoms. The results lead to the
conclusion that there are exchange forces between Ni
and Al atoms, and between Ni and Ni atoms, and that
bond strength between atoms decreases in the order Ni-Al,
Ni-Ni, Al-Al. S. Thon

GUSEVA, L. N.

"On the Nature of the β-Phase of the System Nickel-Aluminium." L. N. Guseva (Doklady Akad. Nauk S.S.S.R., 1951, 77, (Received).[Russian]. Alloys contg. 43.7-62.7 at.-% Ni were prepared from (40.60) Al and electrolytic Ni in a H.F. furnace in a corundum crucible under a mixture of CaF₂ + NaF as flux. Because of the considerable amount of heat liberated during the formation of the compound NiAl, the furnace was switched off from the beginning of melting until the end of the reaction. Rods ~3 mm. in dia.

and 15-25 cm. long were cast in a porcelain tube, and homogenized by heating at 1100° C. for 4 hr. in vacuo. Rods free from surface defects were used for potentiometric measurement of the elect. resistivity (ρ) at 25° and 105° C., and were then broken to see whether cavities were present, were analysed chem., and their structure determined by X-ray analysis, using Co radiation. The lattice const. a was calculated from the doublet (310)₁,₂, the powder being prepared in a mortar and then annealed at 100° C. for 30 min. in vacuo. Clear resolution of the doublet was obtained. The data obtained confirm Bradley and Taylor's conclusions (Proc. Roy. Soc., 1937, [A], 159, 56; M.A., 4, 241) concerning the boundaries of the β phase, that the max. on the a/comp. curve is not at 50 at.-% Ni but at a compn. richer in Al (~43% Ni). The max. on the temp. coeff. of resistivity/compn. curve, and the min. on the ρ/compn. curve, both occur at a similar place. Taichev (Zhur. Tekh. Fiziki, 1940, 10, 310) reported that at 600° C. the Al-50 at.-% Ni alloy undergoes partial disordering, two b.c.c. lattices with const. differing by 0.04 Å being present; to determine these lattice const. more accurately, G. has made X-ray measurements on alloys contg. 49.4 and 50.5 at.-% Ni at room temp., 600°, and 800° C. All the photographs indicated the presence of an ordered cubic structure of CsCl type; lines not corresponding to this structure were not observed, and photometric measurement of the intensity of the (100) and (110) lines on photographs taken at 800° C. showed that the ordering had not changed on heating. The lattice const. of Al-49.4 at.-% Ni in the quenched condition was 2.878 Å. (compared with 2.880 Å. in the annealed state); the difference is within the experimental error, and could be connected with the appearance of lattice defects at high temp.—G. V. E. T.

Comments and evaluation

B-78524, 8 Sep 54

GUSEVA, L. N.

(2)   5

*Structure of Alloys of Nickel with Aluminium in the β-Phase Region at High Temperatures. L. N. Guseva and E. S. Makarov (Doklady Akad. Nauk S.S.S.R., 1951, 77, (4), 615-618).—[In Russian]. Alloys contg. 60-66 at.-% Ni quenched from 1340° C. are single-phase and have a tetragonal structure. X-ray analysis of these alloys in the annealed state shows the presence of two phases, β + x' (Ni₃Al), in agreement with the equilibrium diagram of Bradley and Taylor (Proc. Roy. Soc., 1937, [A], 159, 56; M.A., 4, 241). The quenched alloys have a partially ordered body-centred structure. For the alloy with 60·6 at.-% Ni (Ni₂Al), $a = 2.063$, $c = 3.237$ kX, $c/a = 1.125$; $d = 6.66$; number of atoms in unit cell $= 1.96$. For the alloy with 66·6 at.-% Ni (Ni₂Al), number of atoms in unit cell $= 2.01$. The observed intensities of the reflections in an X-ray photograph of an alloy contg. 60·6 at.-% Ni, quenched from 1340° C., agree satisfactorily with the values calculated for Ni₂Al₂.

—G. V. E. T.

Evaluation B-78524, 8 Sep 54

GUSEVA, L. N.

USSR/Chemistry - Magnesium-Silicon Compound   Jan/Feb 52

"Experimental Study of Electron Density of Crystals. V. Electron Density of Mg_2Si," N. V. Ageyev, L. N. Guseva, Inst of Gen and Inorg Chem imeni Kurnakov, Acad Sci USSR

"Iz Ak Nauk, Otdel Khim Nauk" No 1, pp 31-39

Mg_2Si is a representative of the group including Mg_2Ge, Mg_2Sn, and Mg_2Pb, which all have the same cryst structure. Exptl detn was carried out of the structural factors of an alloy similar in compn

208T2

USSR/Chemistry - Magnesium-Silicon Compound (Contd)   Jan/Feb 52

to Mg_2Si. The study of distribution of electron density allows clarification of the character of the chem bonds of the atoms in the crystal lattice of the above compds. The diagram of the state of the Mg-Si system was studied and showed that Mg_2Si is a unique compd, forming 2 eutectics with the components. If forms no solid solns.

208T2

(CA 47 no.20:10306 J3)

GUSEVA, L.N.

(2)

Experimental study o' the electron density in crystals. V. Electron density of Mg_2Si. N. V. Ageev and L. N. Guseva. Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci. 1953, 3T-9(Engl. translation).—See C.A. 46, 6893b.
H. L. H.

Guseva, L. N.

137-58 1-1248

Translation from: Referativnyy zhurnal Metallurgiya, 1958, Nr 1, p 168 (USSR)

AUTHORS: Guseva, L. N., Nikonov, A. G.

TITLE: Use of X-ray Structural Analysis for Investigation of Harden-
           ability of Wheel Steel in Sliding Friction (Primeneniye rent-
           genostrukturnogo analiza dlya issledovaniya zakalivayemosti
           kolesnoy stali pri trenii skol'zheniya)

PERIODICAL: Tr. In-ta metallurgii, AN SSSR, 1957, Nr 1, pp 120-123

ABSTRACT: One of the most common defects on the contact surface of
           railroad wheels is the flat spot due to braking action. The form-
           ation of flat spots is the result of excessive heating at the point
           of contact between the wheel and the rail when moving with
           brakes locked, the heating being followed by subsequent rapid
           escape of heat within the rim. In the heating zone, a hard and
           brittle work-hardened crust up to 3 mm in thickness, that is
           discolored as the wheel continues in use, comes into being. In
           order to reproduce the hardened layer forming at the surface of
           a wheel under sliding friction for purposes of laboratory repro-
           duction and investigation, a special machine was designed. De-
Card 1/2   termination of hardenability under various conditions of heat

1 37-58-1-1248

Use of X-ray Structural Analysis (cont.)

treatment was performed by evaluating the shift of line (011) or comparing
the width of x-ray lines (110) - (011) of the test specimens of carbon and
wheel steel against the width of the lines of standard specimens (S) of carbon
steel hardened to martensite, and by measuring the microhardness of the
surface of the S. It was found that in the S of wheel steel of the various chem-
ical compositions investigated, and in the area of the flat spots due to brak-
ing, products of austenite transformation are present due to rapid cooling at
close to the critical rate. The tendency of the steel of the grades investigated
to harden under conditions of sliding friction varies and may be determined
by the width of the interference lines (110) - (011). The S revealing the great-
est hardness also presented the greatest expansion of the lines (011). The
width of the x-ray lines obtained in the S of wheel steel investigated and S
from zones with flat spots due to braking on an operational wheel were greater
than the width of lines of hardened standard S, which is due to the change in
the structure of the crystal lattice arising out of the special conditions of
hardening.

N. T.

1. Steel--Structural analysis 2. X-ray--Applications   3. Steel--Heat
treatment

Card 2/2

(Guseva, L.N.)

AUTHORS: Ageyev, N.V., Guseva, L.N. and Markovich, K.P. (Moscow).

TITLE: Phase transformations in chromium rich, Cr-Mo-Fe alloys.
             (Fazovye prevrashcheniya v splavakh khrom-molibden-zhelezo,
             bogatykh khromom).   24-4-4/34

PERIODICAL: "Izv. Ak. Nauk, Otd. Tekh. Nauk" (Bulletin of the Ac. Sc.,
             Technical Sciences Section), 1957, No.4, pp.23-32 (USSR).

ABSTRACT: The kinetics of the disintegration of the solid solution
             of 60:25:15 type Cr-Mo-Fe alloys were investigated for
             chromium contents of 62 and 56 wt.% respectively. It was
             found that at $1050°C$ these alloys are in the range of the
             α-solid solution. At $950°C$ both alloys undergo decomposi-
             tion of the solid solution accompanied by the separation
             of the σ-phase of the composition Cr(MoFe); this disinte-
             gration process brings about an increase in hardness of
             the alloys. At the temperatures 850 and $750°C$ the alloy
             containing 62% Cr is at the boundary of the $\alpha + (\alpha + \sigma)$
             phases. A decrease of the Cr concentration in the alloy
             to 56% leads to a disintegration of the solid solution at
             these temperatures. At $850°C$ the alloy gets hardened less
             than at $750°C$; in the latter case a finely dispersed phase
             separates out during ageing. The kinetics of the disinte-
             gration of the solid solution of a 60:15:25 type alloy was
             investigated in the temperature range $1050-750°C$; at all

Card 1/3

Phase transformations in chromium rich, Cr-Mo-Fe alloys,
(Cont.)   24-4-4/34

the temperatures separation of the σ-phase from the solid
solution was observed. Increases in hardness were ob-
served at holding times up to twenty hours. After a 100
hr holding, the hardness of the alloys dropped. The
volume of the solution during the disintegration of the
alloys of both types changes very little, namely, within
the limits of ± 0.002 kX. Comparison of the kinetics
of disintegration of the solid solutions type 60:25:15
and 60:15:25 leads to the conclusion that the speed of
the diffusion process increases in the case of substi-
tution in these alloys of iron for molybdenum. The high
speed of the diffusion process in the 60:15:25 type
alloys and their coarse grain crystalline heterophase
structure at temperatures below 1000°C should lead to a
deterioration of their heat resistant properties. The
kinetics were studied of the ageing of a 60:25:15 alloy
containing 0.07% C, 2.5% Si, 1.5% Al. It was established
that in addition to the σ-phase in the temperature range
950 - 750°C a finely dispersed phase rich in Mo is sep-
arated in the alloy which is probably attributable to
carbides of the type $M_{23}C_6$; dehardening of the alloy

during ageing after holding times exceeding 50 hours, is
due to coagulations of this phase. Separation of the

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Phase transformations in chromium rich, Cr-Mo-Fe alloys.
(Cont.)   24-4-4/34

carbide phase from the solid solution leads to consider-
able decreases of the lattice constant of the solid solu-
tion. Introduction of titanium as an alloying element
into 60:25:15 type alloys leads to an increased hardness
in the temperature range 1050-750°C and no dehardening
was observed in the case of long duration ageing (up to
1000 hours). Investigation of the ageing of deformed
alloys of the type 60:25:15 both alloyed and non-alloyed
showed that introduction of titanium reduces their speed
of diffusion process. The composition in wt.% of the
tested specimens is given in a small table, p.23.

There are 23 figures including graphs, micro-photographs
and radiographs. There are 4 American, 1 English and 1
German references.

Card 3/3

SUBMITTED: August 6, 1956.

AVAILABLE:

GUSEVA, L N

AUTHORS: Guseva, L. N. and Ovechkin, B. I. (Moscow). 24-6-5/24

TITLE: A study of chromium-silicon alloys rich in chromium.
(Issledovaniye splavov khroma s kremniyem, bogatykh kromom).

PERIODICAL: "Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk"
(Bulletin of the Ac.Sc., Technical Sciences Section),
1957, No.6, pp.27-31 (U.S.S.R.)

ABSTRACT: Studies of Cr-Si alloys have been reported in refs.1 to 5.
In the present work the region of phase diagram rich in
chromium (up to 35% Si) was investigated. 99.8% pure silicon
and electrolytic refined chromium were used. The solubility
of Si in Cr was determined by smelting the alloy in an
argon atmosphere in an arc furnace. Before smelting, the
specimens were pressed and sintered at a temperature of 900 C
in a vacuum. For alloys containing more than 8% of Si, the
smelting was carried out in a high frequency furnace in
corundum crucibles under barium chloride. Table 1 shows the
chemical and phase composition of the alloys investigated
(First column: number of alloy. Second column: wt. % Si,
based on the charge . Third column: wt.% Si, based on
chemical analysis. Fourth column: phase composition).
Homogenising treatment was carried out in a vacuum, in quartz
ampules, at 1200 C for 120 hours, after which the alloys were

Card 1/3

24-6-5/24

A study of chromium-silicon alloys rich in chromium.(Cont.)

cooled down slowly. The study was carried out by X-ray
(powder) and microstructure analyses. The solubility of
Si in Cr is shown in Fig.1 (q - wt.% Si and α - solid
solution of Si in Cr). Cast alloys containing up to
3.5% Si have a single-phase structure. Higher Si content
leads to the appearance of a second phase in the process of
crystallisation (Figs. 2 and 3). Phase X-ray analysis
showed that Cr_3Si is evolved out of the solid solution.
With hardening above 1100 C the amount of the surplus
phase increases, Fig.6. After holding the specimens at
800 C a single-phase structure was found only in alloys
having 1.5% Si. The introduction of Si into the Cr
lattice leads to a decrease in the constant of the latter
from 2.881 for pure chromium to 2.877 for solid solution
containing 4.5% Si (hardened at 1350 C). The alloy
containing 15% Si gave a diffraction picture corresponding
to Cr_3Si. Between 10% Si and 24.5% Si, in addition to the
Cr_3Si line, lines of a new phase, x, were observed. The
intensity of these lines increases as the Si content is
increased. While, at the same time, the intensity of the
Cr_3Si lines decreases. The Cr_3Si phase is absent in the
Card 2/3   24.6% Si alloy. In 26.3% Si alloy, in addition to lines

24-6-5/24

A study of chromium-silicon alloys rich in chromium.(Cont.)

of the x-phase, one observes CrSi lines (Fig.7). Results of X-ray analysis are supported by micro-structure studies, Fig.8. Primary evolution of Cr_3Si and secondary evolution of the x-phase are seen in the 17% Si alloy (Fig.8a). As the silicon content increases, the amount of this phase increases. The alloy containing 20% Si, which corresponds to the stoichiometric relation for Cr_2Si, still contains a considerable amount of Cr_3Si, Fig.8b. At the same time, the character of the structure remains unchanged. The 24.5% Si alloy has a microstructure near to the single-phase type, Fig. 8 ζ. Further increase in Si content leads to a primary evolution of the x-phase and the eutectic

Card 3/3   composition x + CrSi.
There are 8 figures and 2 tables and 5 references, one of which is Slavic.

SUBMITTED: August 6, 1956.

AVAILABLE:

GUSEVA, L. N.

46. **Semiconductor Properties of Chromium Silicides Investigated**

"The Thermoelectric Properties of Chromium Silicides," by L. N. Guseva and B. I. Ovechkin, Institute of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR, Doklady Akademii Nauk SSSR, Vol 112, No 4, 1 Feb 57, pp 681-683

The preparation of chromium silicides is described. Investigation of the electrical and thermoelectric properties of these silicides showed that the compounds Cr_3Si, Cr_5Si_3, and $CrSi$ exhibit conductivity of the metallic type, whereas the compound $CrSi_2$ is a simiconductor with an energy of activation equal to about 1.3 electron-volts. (U)

AUTHOR   GUSEVA L.N.   PA - 3145

TITLE   Atomic Scattering of X-rays in Copper-Zinc Alloys.
(Atomnoye rasseyaniye rentgenovskikh luchey v splavakh medi s tsinkom-Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 3, pp 567-570 (U.S.S.R.)
Received 6/1957   Reviewed 7/1957

ABSTRACT   Extinction quantities were compared with the reflections of pure copper by
means of the exchange method. This makes it possible to obtain two indepen-
dent interference images at equal conditions. The powders, which were sub-
jected to heat treatment, were investigated by the photographic, and the
deformed powders by the ionization method. Investigation extended to alloys
with 0.5, 10, and 50 weight%. As initial substances electrolytic metals
were used. It is shown that in alloys the intensity of reflection increa-
ses with an increase of the concentration of solid solutions, but that the
intensity of the lines remains nearly unchanged, whereas the intensity of
higher reflexes diminishes considerably with an increase of the angle of re-
flection in comparison to the intensity of the corresponding copper lines.
The modification of the interference maxima showed that the case of copper
and a 10% Zn alloy the broadening of the lines in the case of deformation
was different, All lines of the solid solution are broader than the corre-
sponding lines of pure copper. It is shown that the distortions of the cry-
stall lattice are anisotropic in character on the occasion of deformation.
This might be connected with the formation of domains of coherent disper-
sion having unequal axes, as well as with the anisotropic modification of the

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Atomic Scattering of X-rays in Copper-Zinc Alloys.   PA - 3145

distances between the planes in this process. It is shown that with a rise
of temperature by annealing the intensity of the reflection of higher-refle-
xes of the alloy rises, but that after annealing at 600° the intensity of all
reflexes of the solid solution becomes equal to the intensity of the corre-
sponding reflexes of copper. When filling a 50% Zn alloy a considerable
broadening of all lines was observed, on which occasion the anisotropic
character of the distortions of the crystall laticce were very marked. A
table shows the relative intensittes of the reflections of the alloy after
resting and annealing.
(With 2 illustrations, 4 tables, and 1 Slavic reference)

ASSOCIATION   Institute for Metallurgy"A.A.BAYKOV'S" of the Academy of Science of the
PRESENTED BY   URAZOV G.G., Member of the Academy   U.S.S.R.
SUBMITTED   18.5.1956
AVAILABLE   Library of Congress
Card 2/2

· (- U S E u r) / /l

24-58-3-16/38

· AUTHORS: Guseva, L.N., Ovechkin, B.I. (Moscow)

TITLE: The Properties of the β-phase of the Ni-Al System (Svoystva beta-fazy sistemy nikel'-alyuminiy)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 118-119 (USSR)

ABSTRACT: An investigation of the properties of alloys on the basis of their composition gives an insight into a peculiar structure of this phase which is within the limits of 45.25-60% atomic per cent Ni. Electrical properties of this phase were studied in earlier work of one of the authors (Ref.2). The variation of electrical resistance with the composition is shown in a graph (p.119). The curve is characteristic for solid solutions; an increase in concentration of the solid solution is accompanied by an increase of electrical resistance of the alloy. Later, Nikolayeva and Umanskiy (Ref.3) studied the characteristic temperature and microhardness of this phase. It was found that an alloy of stoichiometric composition has shown a higher microhardness than a solid solution on the same basis. The authors explain this change in hardness of the alloys by their characteristic temperature,

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The Properties of the β-phase of the Ni-Al System.

i.e. by their interatomic forces, which also decreased during transformation from a NiAl compound to a solid solution. However, these results are in contradiction with electrical conductivity data of such alloys. In this paper the hardness of alloys in this β-phase range is studied, using cast test specimens made from electrolytic Ni and 99.9% pure Al. The melting was done in a high frequency furnace. Homogenization annealing was carried out at 1200°C for 150 hours. Radiograms were obtained by means of an RKO camera with Co radiation. Microhardness was measured by means of a PMT-3 instrument with a load of 100 g and the macrohardness by the Vickers method with a load of 10 Kg using as an inductor a diamond pyramid. The results are entered in a table (p.119). X-ray phase analysis and microscopic examinations have shown that all alloys under the investigation had a one-phase structure. From the data obtained it is clear that alloys near to the stoichiometric composition show minimum hardness and minimum electrical resistance. On increasing the Ni or Al content from the stoichiometric ratio, both the hardness and the electrical resistance increase. Depending on their composition, such characteristic changes of the properties of the alloys may be related to the structure of the crystal lattice

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of the solid solution. According to Bradley and Taylor (Ref.1) 1% of Ni in the Ni-Al compound is substituted by Al. Only if the Al content is high a structure defect will exist in the solid solution and particularly in this region of concentration there will be an increase in the speed of changes of the properties. This is in agreement with the changes in the lattice constant of the solid solution as a function of its concentration (see graph p.119). The decrease of the characteristic temperature of solid solutions observed by Nikolayeva and Umanskiy (Ref.3) is not in contradiction with obtained data on the hardness of alloys, since the hardness, measured by applying pressure to an inductor, is defined not only by the interatomic forces in the crystal lattice but also by the structural changes taking place in the alloys during their plastic deformation. There are 1 table, 1 figure and 2 Soviet and 1 English reference. (Almost complete translation, except for the figure and table captions).

SUBMITTED: October 5, 1957.

Card 3/3   1. Alloys--Properties

AUTHOR: Guseva, L. N. **Babareko, A.A.**   SOV/...-...-...-...

TITLE: The Distortions of the Crystal Structure of Copper and Its
solid Solutions by Deformation (Iskazheniya kristallicheskoy
struktury medi i yeye tverdykh rastvorov pri deformatsii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 3, pp.518-520
(USSR)

ABSTRACT: In a previous paper by L. N. Guseva (Ref 1) it was found that
a rather long thermal treatment is necessary for the suppres-
sion of the effects of deformation in copper and its alloys.
The reason for this may be the inhomogeneous states after
filing. It was interesting, in these objects, to study the
changes of the crystalline fine structure caused by plastic
deformation. The broadening of the X-ray interference maxima
of the metals during deformation served the purpose of estimat-
ing structural distortions. A table contains the widths mea-
sured at half the height of the maxima. The broadening of
reflections at one and the same degree of deformation is greater
in both of the solid solutions under investigation than in
pure copper. This difference is all the more important the

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SOV/2u-120-3-22/67

The Distortions of the Crystal Structure of Copper and Its Solid Solutions
by Deformation

higher the concentration of the solid solution and the greater
the difference in the atomic dimensions of the components
of the alloys. In one and the same alloy filing widens re-
flexes considerably. The second table contains the values of
the true width of the reflexes (111) and (222) by the powders
of copper and its solid solutions. The microtensions in pure
copper (which was filed at a low temperature) as well as in
alloys with 10 % Zn and 4,6 % Al were similar to each other.
Various details are given. The domains of the coherent scat-
tering are smaller in the alloys than in pure copper. The
difference in the behavior of copper and of the solid solu-
tions during annealing can be explained by the influence exer-
cised by the characteristic features of substructure upon
the growth of the crystallites. There are 2 tables and 6
references, 7 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR
                (Metallurgical Institute imeni A. A. Baykov, AS USSR)

SUBMITTED: December 7, 1957, by I. P. Bardin, Member, Academy of Sciences,
Card 2/3   USSR

SOV/20-120-3-22/67

The Distortions of the Crystal Structure of Copper and Its Solid Solutions by Deformation

SUBMITTED: December 3, 1957

1. Copper--Crystal structure   2. Copper alloys--Crystal structures
3. Copper--Deformation   4. Copper alloys--Deformation

Card 3/3

VOL, Abram Yevgen'yevich; AGEYEV, N.V., red.; ABRIKOSOV, N.Kh., doktor
   tekhn.nauk, red.; KORNILOV, I.I., red.; SAVITSKIY, Ya.M., red.;
   OSIPOV, K.A., doktor tekhn.nauk, red.; GUSEVA, L.N., kand.khim.
   nauk, red.; MIRGALOVSKAYA, M.S., kand.khim.nauk, red.; SHKLOV-
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and boron systems] Fiziko-khimicheskie svoistva elementov; Sistemy
azota, aktiniia, aliuminiia, ameritsiia, bariia, berilliia, bora. 1959.
755 p.   (MIRA 13:3)

1. Chlen-korrespondent AN SSSR (for Ageyev).
   (Metals)   (Phase rule and equilibrium)

SOV/180-59-2-14/34

AUTHORS: Guseva, L.N., and Ovechkin, B.I. (Moscow)

TITLE: Atomic Scattering of X-Rays on Solid Solutions of Copper
             with Nickel (Atomnoye rasseyaniye rentgenovykh luchey na
             tverdykh rastvorakh medi s nikelem)

PERIODICAL: Izvestiya akademii nauk SSSR, Otdeleniye tekhnicheskikh
             nauk, Metallurgiya i toplivo, 1959, Nr 2, pp 82-85 (USSR)

ABSTRACT: The authors have measured the intensity of the
             diffraction spectra of copper-nickel alloys to study the
             deviation of the atomic scattering function from
             additivity. Specimens were prepared by melting the
             electrolytic metals, homogenizing at 900 °C for eight
             days in vacuum and filing to pass through a 300-mesh
             sieve. Before screening the filings were heat treated
             to remove stresses. The investigation was effected with
             copper filtered radiation, with photometry of the
             diagrams on a type MF-4 microphotometer. To allow for
             the influence of the thermal factor on reflection
             intensity the alloy characteristic temperature was
             determined to an accuracy of ± 6% by obtaining
             diffraction spectra at two temperatures (22 and -135 °C)
Card 1/3   in a RKD camera with a special cover. Condensation