S/120/61/000/002/004/042
E032/E114

26.2242

AUTHORS: Dulin, V.A., Kazanskiy, Yu.A., Kuznetsov, V.F., and Smirenkin, G.N.

TITLE: A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.2, pp.35-41

TEXT: The transformation of the amplitude distribution due to recoil protons into the neutron energy spectrum in the case of a small crystal (negligible multiple neutron scattering) for which the light output depends linearly on the proton energy, can easily be carried out by differentiating the experimental spectrum. In fact, in the case of stilbene which was used by the present authors the relation is not linear and small crystals cannot be used if an adequate counting efficiency is to be obtained. The light output due to recoil protons and the form of the amplitude distribution due to monoenergetic neutrons was investigated using a Van de Graaf generator and the $T(p,n)He^3$, $D(d,n)He^3$ and $T(d,n)He^4$ reactions. Neutron energies in the following ranges could thus be obtained: 0.3-3.5, 4-7.5 and

A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

17-22 Mev respectively. The amplitude distributions due to recoil protons for 4.3 and 16.8 Mev neutrons are shown in Fig.1. The recoil-proton energy distribution P(E) can be obtained from the amplitude distribution $\Phi(V)$ with the aid of the following relation:

$$\Phi(V)dV = P(E)dE,$$

$$P(E) = \Phi[V(E)] \frac{dV}{dE} = F(E) \frac{dV}{dE} \qquad (1)$$

The functions V(E) and dV(E)/dE which are necessary to compute the neutron spectra are shown in Fig.2. The experimental values of V(E) are well represented by the Birks theory (Ref.1) according to which

$$V(E) = \int_0^E \frac{dV}{dE'} dE' = \text{const} \int_0^E \frac{dE'}{1 + kB \cdot dE'/dx} \qquad (3)$$

Card 2/ 7

S/120/61/000/002/004/042
E032/E114

A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

If dE'/dx is expressed in Mev/cm of the range in air then kB turns out to be 20 cm/Mev. Fig.3 shows the recoil proton spectra for 1.0, 1.8 and 3.6 Mev neutrons. These curves were obtained with a cylindrical stilbene crystal (30 mm diameter, 15 mm long). The curves have a hump at the high energy end which is due to multiple neutron scattering. The latter effect is small for neutron energies greater than about 2 Mev. It can therefore be neglected at the higher energies. Fig.4 shows the energy dependence of the resolution of the single-crystal spectrometer. The resolution in the energy range 1-22 Mev can be described by the formula:

$$\Delta E_n/E_n = 20/\sqrt{E_n}\ \%$$

The efficiency of the spectrometer η can be described by:

$$\eta(E_n) = \frac{1 - \exp\left[-\Sigma(E_n)d\right]}{E_n}\ \Delta E \qquad (4)$$

Card 3/7

21394
S/120/61/000/002/004/042
E032/E114

A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

where ΔE is the differentiation step for the recoil proton distribution. The efficiency for the above stilbene crystal was found to be about 3% at 2 Mev and about 0.5% at 10 Mev (the differentiation step was taken to be equal to the energy resolution ΔE_n). The discrimination against gamma rays is based on the differences in the effective scintillation decay constant for neutrons and gamma rays. The present authors have used the scheme suggested by Birks and described in detail by F.D. Brooks in Nucl. Instrum. and Methods, 1959, 4, 151 (Ref.5). Fig.13 shows neutron spectra for a Po-Be source (curve 1 - present results, curves 2 and 3 due to B.G. Whitmore and W.B. Backer (Ref.7: Phys.Rev., 1950, 78, 799) and J.O. Elliot and W.I. McGarry and W.R. Faust (Phys.Rev., 1954, 93, 1348, Ref.8). It is stated that the overall efficiency for neutrons having an energy of 2 Mev has been increased to about 10%. The gamma ray efficiency is lower by a factor of 100. Acknowledgements are expressed to L.D. Gordeyev, Yu.I. Baranov, V.I. Bol'shov and

Card 4/7

Yu.V. Pankrat'yev for assistance in this work.
There are 14 figures and 9 references: 2 Soviet and 7 English.
SUBMITTED: June 26 1960

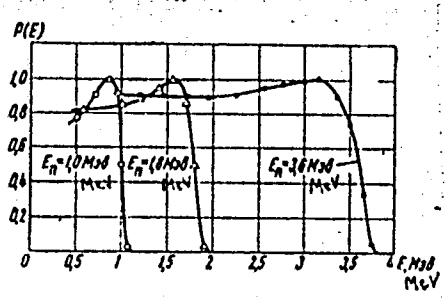


Fig. 3

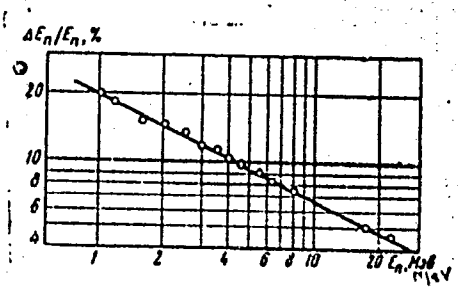


Fig. 4

Card 5/7

KUZNETSOV, V.F.

13

21406
S/089/61/011/006/002/014
B102/B138

21.1000

AUTHORS: Leypunskiy, A. I., Abramov, A. I., Aleksandrov, Yu. A., Anikin, G. V., Bondarenko, I. I., Guseynov, A. G., Ivanov, V. I., Kazachkovskiy, O. D., Kuznetsov, V. F., Kuz'minov, B. D., Morozov, V. N., Nikolayev, M. N., Sal'nikov, O. A., Smirenkin, G. N., Soldatov, A. S., Usachev, L. N., Yutkin, M. G.

TITLE: Investigation of the BR-5 (BR-5) fast reactor (spatial and energy distributions of neutrons)

PERIODICAL: Atomnaya energiya, v. 11, no. 6, 1961, 498 - 505

TEXT: The fast research reactor BR-5 and its experimental equipment is described in brief and some of its neutron spectra are given and discussed. The following data are given: fuel - plutonium oxide; coolant - sodium; reflector - thin layer of natural uranium plus thick layer of nickel; power - 5000 kw. The reactor has many vertical and horizontal holes for technical and physical studies and is well supplied with experimental equipment. Leypunskiy gave a detailed description of the BR-5 reactor at

Card 1/3

Investigation of the...

the Second Geneva Conference (1958). Inside the core the neutrons have energies of more than 100 kev which they lose almost completely in passage through reflector and shield. In the outer layers of the shield, their mean energy does not exceed some tens of ev. In the kev range (E_n>50 kev) spectra were measured for the most important beams and channels. For the other cases, they were determined from threshold reactions. The soft part of the spectrum within the reflector was determined from the spatial distribution of neutrons with $E_n \approx 5$ ev, recorded with gold resonance indicators. The total neutron flux was determined only at the points where the Pu^{239} fission cross section was constant. Direct neutron spectrum measurements were carried out in a vertical (OK-70) and a horizontal (B-3) channel using (He^3+Ar)-filled ionization chamber in the first case and the neutron transmission method with n-hexane in the second. The neutron spectrum of the horizontal channel was also determined by photoemulsions. From the rates of indicator and fission reactions $Au^{197}(n,\gamma)$, $U^{235}(n,f)$ $Pu^{239}(n,f)$, $Th^{232}(n,f)$, $Na^{23}(n,\gamma)$ $Cu^{63}(n,\gamma)$, and $Al^{27}(n,\alpha)$ the abrupt

Card 2/3

13

21106
S/009/61/011/006/002/014
B102/B138

Investigation of the...

drop in neutron energy in the Ni reflector was determined, and the activity caused by resonance neutrons (E_n = 4.9 ev). The fast neutron flux ($E_n > 1.4$ Mev) in the core center was found to be $(2.4 \pm 0.2) \cdot 10^{14}$, and total flux was $(8.2 \pm 0.3) \cdot 10^{14}$. Experimental results were verified by energy-group calculations (18 groups). Good agreement between theory and experiment was also found for the channel spectra. The authors thank D. S. Pinkhasik, N. N. Aristarkhov, and the reactor personnel for assistance. There are 10 figures, 2 tables, and 2 Soviet references.

SUBMITTED: August 17, 1961

Table 1. Reaction cross sections in the core center.

Legend: (1) Reaction; (2) experiment; (3) σ calculated, given in barns.

Fig. 7. Neutron transmission spectrum (n-hexane) for the horizontal channel B-3.

X

Card 3/3

L 14932-63 EPF(n)-2/EWT(m)/BDS AFFTC/ASD/SSD Pu-4 DM
ACCESSION NR: AP3003980 S/0089/63/015/001/0064/0066 69 63

AUTHORS: Blyumkina, Yu. A.; Bondarenko, I. I.; Kuznetsov, V. F.; Nesterov, V. G.; Okolovich, V. N.; Smirenkin, G. N.

TITLE: Number of prompt neutrons and kinetic energy of fragments in low-energy fission of U sup 235

SOURCE: Atomnaya energiya, v. 15, no. 1, 1963, 64-66

TOPIC TAGS: prompt neutron, U sup 235, kinetic energy of fission fragment, Fowler hypothesis

ABSTRACT: According to Fowler's hypothesis, the kinetic energy of the fission fragment does not depend on the excitation energy of the splitting atom, from which it follows that the average number of prompt neutrons (a.n.p.n.) is increasing linearly with the increase of the energy E_n of neutrons producing fission. For large E_n, this approximately valid, but may not be correct for low E_n. The present work was conducted in order to investigate the lower E_n range in greater detail. The data sought are important practically, and may help to clarify the nature of the fission channels and the mechanism which produces the distribution of the observed energy. U_{235} was used as target; the reaction T(p, Alpha) was pro-

Card 1/2

L 14932-63
ACCESSION NR: AP3003980

6

duced with an electrostatic generator. The correlation between E_n and a.n.p.n. is presented in three figures. The results are discussed. "The authors express their deep appreciation to A. I. Leypunskiy for attention and constant interest to work, to L. N. Usachev and V. N. Andreyev for fruitful discussion of experimental results, and gratitude to V. I. Bol'shov, L. D. Gordeyeva, and L. I. Prokhorova for help with the work and participation in various stages of measurements." Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 04Aug62 DATE ACQ: 08Aug63 ENCL: 00

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

Card 2/2

AT4048278

Usachev, L. N.

Effect of the energy gap in the channel spectrum on the process

VGS: nuclear fission, fission

ACCESSION NR: AT4048278

... in the energy dependences of ...

... and Pu^{239} by neutrons ...

... by a procedure ...

... angular momentum of the compound nucleus ... the fission ... is also shown that, in contrast to earlier notions new

AT4048

fission channels can open up at energies up to the excitation energy ... point (E^* = 2.5 MeV) ... where ... larger ... state. The presence of an energy gap in the level spectrum of the transition nucleus U^{236} can likewise explain the observed decrease in the number of secondary fission neutrons near 2.2 MeV. Other experimental data are interpreted in light of these results. Orig. ... figures.

NR REF SOV 007

3/3

BONDARENKO, I. I.; KUZNETSOV, V. F.; NESTEROV, V. G.; PAVLINCHUK, V. A.; PROKHOROVA, L. I.; RABOTNOV, N. S.; SMIRENKIN, G. N.; USACHEV, L. N., Obninsk

"Effects of energy gap in channel spectrum on the fission process."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

KUZNETSOV, V.F., inzh.

Damping capacity of a single-motor drive in a generator-motor system. Izv.vys.ucheb.zav.;gor.zhur. 7 no.9:174-180 '64.

(MIRA 18:2)

1. Moskovskiy institut radioelektroniki i gornoy elektromekhaniki. Rekomendovana kafedroy avtomatiki i upravlyayushchikh mashin.

YUKHOV, V.V., inzh.; KUZNETSOV, V.F., inzh.

Automatic device for regulating the voltage of storage batteries.
Elek. sta. 33 no.8:85-86 Ag '62. (MIRA 15:8)
(Voltage regulators) (Storage batteries)

GORBUNOV, Pavel Petrovich; KUZNETSOV, Vladimir Filippovich; PLATONOV, S.A., red.; MEDNIKOVA, A.N., tekhn.red.

[Radio engineering and its applications] Radiotekhnika i ee primenenie. Moskva, Voen.izd-vo M-va obor.SSSR, 1960. 375 p. (MIRA 13:12)

(Radio, Military)

KUZNETSOV, V.F., inzh.

Modeling the electromechanical turning system of an ESh-50/125 walking excavator. Izv. vys. ucheb. zav.; gor. zhur. 6 no.10:147-154 '63. (MIRA 17:2)

1. Moskovskiy institut radioelektroniki i gornoy elektromekhaniki.

NECHAYEV, A.A.; GOMBERG, V.S.; KUZNETSOV, V.F.

Technology of a system for the purification of drilling mud. Trudy KNII NP no.17:55-66 '62.

Experimental investigation of the hydrocyclone purification of drilling mud. Ibid.:67-87 (MIRA 17:8)

KUZNETSOV, V.E., insh.

Testing of Br AZhMts 10-3-1,5 bronze hardness. Metalloved. i term. obr. met. no.8:46 Ag '62. (MIRA 15:11)
(Bronze--testing) (Hardness--Testing)

KUZNETSOV, V.F.; IVANTSOV, L.I.

Results of the use of tissue preparations on the collective and state farms in the Russian Federation. Veterinariia 40 no.8:9-10 Ag '63. (MIRA 17:10)

1. Zamestitel' nachal'nika Upravleniya veterinarii Ministerstva proizvodstva i zagotovok sel'skokhozyaystvennykh produktov RSFSR.

KUZNETSOV, Vasiliy Fedorovich; IVANOV, K.A., redaktor; TIKHONOVA, Ye.A. tekhnicheskiy redaktor.

[Navigation] Navigatsiia. Moskva, Izd-vo "Morskoi transport" 1956. 367 p. (MLRA 9:6)
(Navigation)

KUZNETSOV, V.G., starshiy inzhener.

Electrical heating of the oil well bottom. Neftianik 2 no.1:16-17 Ja '57. (MLRA 10:2)

1. 3-y promysel Neftepromyslovogo upravleniya Khadyzhenneft'.
(Oil wells)

KUZNETSOV, V.G.; DANCHEV, V.I.; KNYAZEV, V.S.

Some problems of the petrography of the old weathered surface of the Zirabulak-Ziaetdinskiye Mountains (western Uzbekistan). Trudy MINKHiGP no.25:314-317 '59. (MIRA 15:5)
(Uzbekistan—Weathering)

KUZNETSOV, V.G.; DANCHEV, V.I.

Lithology of the horizon 12 (lower Albian) in Kagan structures (western Uzbekistan) and the paleogeography at the time of its formation. Trudy MINKHiGP no.27:256-265 '60.
(MIRA 13:9)

(Uzbekistan--Rocks, Sedimentary)
(Uzbekistan--Paleogeography)

KUZNETSOV, V.G.

Conditions governing the formation of oil pools in Pashiya layers of the Bol'shekinel' flexure. Geol. nefti i gaza 5 no. 3:40-43 Mr '61. (MIRA 14:4)

1. TSentral'naya nauchno-issledovatel'skaya laboratoriya tresta Orenburgneftegazrazvedka.
(Orenburg Province—Petroleum geology)

BELOKRYLOVA, T.G.; KUZNETSOV, V.G.; MOZHAYEV, N.S.

Oil potential of the Lower Carboniferous of western Orenburg Province. Geol. nefti i gaza 6 no.12:41-44 D '62. (MIRA 15:12)

1. TSentral'naya nauchno-issledovatel'skaya laboratoriya tresta Orenburgneftegazrazvedka.
(Orenburg Province—Petroleum geology)

KUZNETSOV, V.G.

Features of the oil-bearing Lower Carboniferous sediments of Orenburg Province. Trudy MINKPiGP no.43:298-306 '63.
(MIRA 17:4)

GRACHEVSKIY, M.M.; KUZNETSOV, V.G.

Paleogeography of the Bobrikovskii time in the central trans-Volga region. Dokl. AN SSSR 150 no.1:146-148 My '63. (MIRA 16:6)

1. Predstavleno akademikom D.V.Nalivkinym.
(Volga Valley--Paleogeography)

KUZNETSOV, V.G.

Types of sections of lower Carboniferous oil-bearing sediments in Orenburg Province and adjacent regions. Trudy VNIGNI no.36: 210-218 '63. (MIRA 17:9)

KUZNETSOV, V.G.

Oil and gas potential of the depression facies of the Upper Devonian-Tournai stage in Orenburg Province. Izv. vys. ucheb. zav.; neft' i gaz 7 no.12[illegible]3-5 '64. (MIRA 18:2)

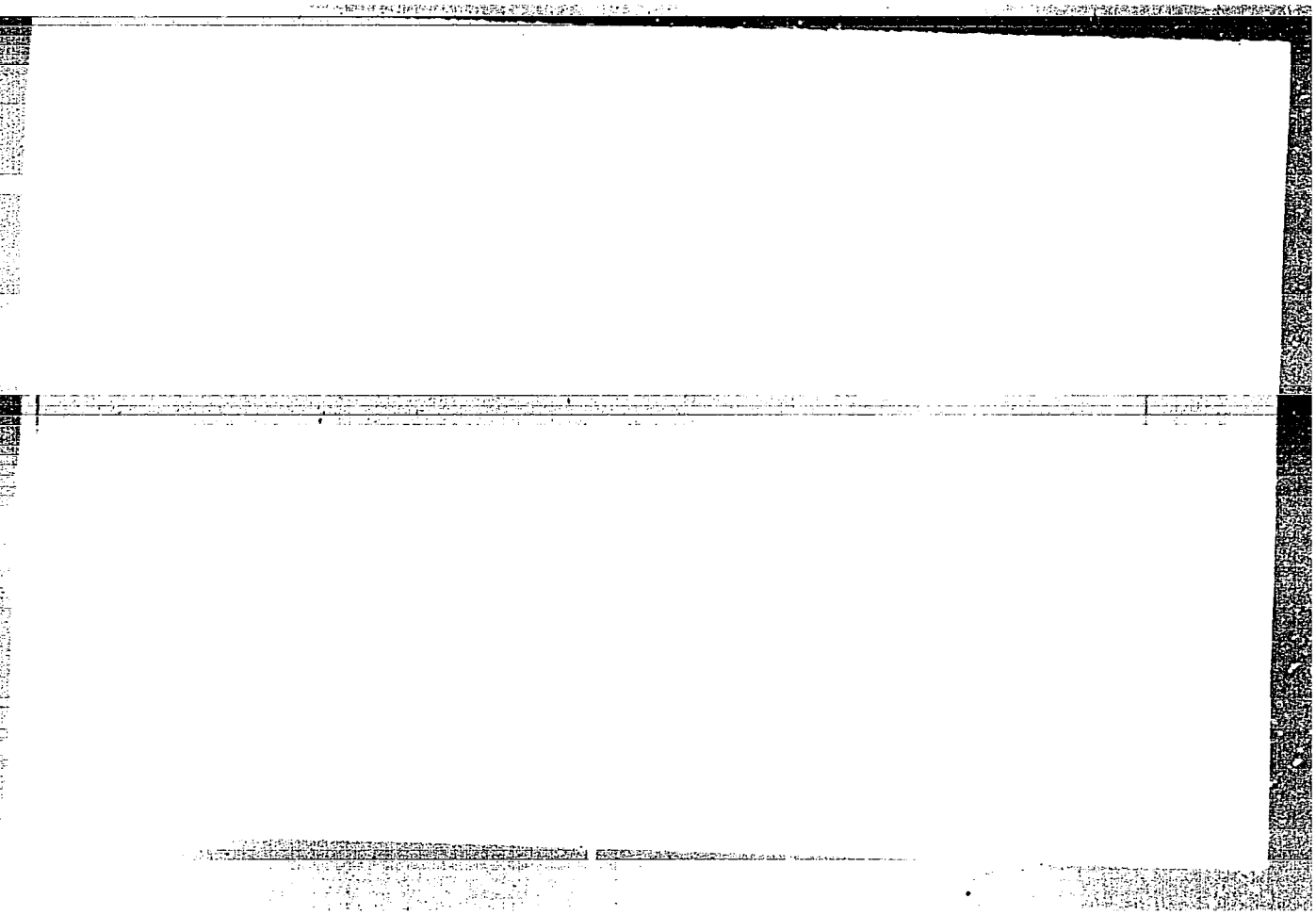
1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akademika I.M. Gubkina.

KUZNETSOV, V.G.

Simple and effective method for examining feces for helminth ova. Med. paraz. i paraz. bol. 33 no.1:105-108 Ja-F '64
(MIRA 18:1)

[redacted] (Moscow)

[redacted] in the disposition of lunar craters and terrestrial volcanoes.



APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210003-6"

ACC NR: AT6036522 SOURCE CODE: UR/0000/66/000/000/0100/0100

AUTHOR: Vikhrov, A. I.; Kolomenskiy, A. V.; Smirennyy, L. N.; Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.

ORG: none

TITLE: Principles of calculating shielding from cosmic radiation [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 100

TOPIC TAGS: spacecraft shielding, radiation protection, solar flare, cosmic radiation biologic effect, radiation shielding

ABSTRACT: The problem of shielding the cosmonaut from high-energy corpuscular radiations is formulated in the following manner: for given conditions (trajectory, flight duration, etc.), the main shielding requirements must be determined (type and thickness of material, arrangement of shielding, etc.) in order to protect cosmonauts from irradiation in greater than permissible doses with minimum additional weight of the shielding. This article describes a paper in which: 1) Chief aspects of methods of calculating shielding were examined. 2) Mean tissue doses for monoenergetic

Card 1/2

ACC NR: AT6036522

proton fluxes, for proton spectra from solar flares and the Earth's radiation belts were calculated. 3) On the basis of these data sample shielding calculations for some spaceflight trajectories were made. 4) The question of the reliability of radiation protection of a spacecraft was discussed. 5) At the end of the paper the main principles of designing shielding for inhabited spacecraft were formulated. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 06, 18, 22 / SUBM DATE: 00May66

Card 2/2

ACC NR: AP5022248 SOURCE CODE: UR/0363/65/001/007/1027/1038

AUTHOR: Yeliseyev, A. A.; Yarembash, Ye. I.; Kuznetsov, V. G.; Antonova, L. I.; Stoyantsova, Z. P.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: X ray phase analysis of lathanum tellurides

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 7, 1965, 1027-1038

TOPIC TAGS: rare earth element, lathanum compound, telluride, phase diagram, crystal chemistry, crystal lattice parameter

ABSTRACT: Crystallochemical properties of lanthanum tellurides have been studied by x-ray phase analysis and differential thermal analysis of the polycrystalline samples which were synthesized by a technique previously described by the authors [Zh. neorgan khimii, 9, 876, (1964)]. The complete phase diagram of the La-Te System was established for the first time on the basis of the new data. Homogeneity limits of the six identified phases were determined. One of the six phases, La_2Te_5, was detected for the first time. The phase previously identified as La_4Te_7 was found to be $LaTe_{1.7\pm X}$. Crystallographic characteristics of all phases were given. The existence of the $MTe_{1.7\pm X}$ and M_2Te_5 phases, where M is a rare earth element from Ce to Sm, was presumed on the grounds of crystallochemical analogy

Card 1/2

UDC: 546.654'241:548.19

ACC NR: AP5022248

between the rare-earth tellurides of other types. Orig. art. has: 8 tables and 5 figures.

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 011

Card 2/2

ACC NR: AT6036520 SOURCE CODE: UR/0000/66/000/000/0099/0099

AUTHOR: Vesolovskiy, L. N.; Gribov, B. S.; Kuznetsov, V. G.; Sakovich, V. A.

ORG: none

TITLE: Measurement of absorbed doses of intermediate neutrons [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 99

TOPIC TAGS: neutron radiation biologic effect, cosmic radiation biologic effect, radiation shielding, radiation protection, radiation dosimetry

ABSTRACT: Study of the effectiveness of biological shielding of a nuclear reactor showed that the most convenient method of detecting intermediate-energy neutrons is neutron detection with preliminary moderation. The sensitivity of such detectors depends on moderator thickness, and also on the geometry of the moderator-detector system as a whole. Detectors with isotropic sensitivity received the most attention. In order to study the angular characteristics of neutron fluxes, a directional neutron detector with variable moderator thickness was created for biological shielding. The sensitivity of the detector was investigated with monoenergetic neutrons in the range 30 kev to

Card 1/2

ACC NR: AT6036520

18 Mev. It was found that use of different moderator thicknesses permits measurement both of neutron fluxes in the energy range 30 kev—18 Mev, and of the physical and biological doses produced by them./[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2

ACC NR: AT6036521 SOURCE CODE: UR/0000/66/000/000/0099/0100

AUTHOR: Vikhrov, A. I.; Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.; Smirennyy, L. N.

ORG: none

TITLE: Evaluation of radiation hazard during a flight to the moon [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 99-100

TOPIC TAGS: lunar spaceflight, cosmic radiation biologic effect, radiation dosimetry, radiation protection, solar flare, radiation permissible dose

ABSTRACT: During lunar flight and lunar landing cosmonauts will be exposed to the Earth's radiation belts, galactic space radiation, corpuscular radiation from solar flares, and lunar radiation itself. It has been calculated that during passage through the Earth's radiation belts, which will take approximately 30 min, the mean tissue dose will not exceed 3—5 rem. On the 30-day lunar flight the dose from galactic space radiation will amount to approximately 4—8 rem. Solar flares represent the greatest radiation

Card 1/2

ACC NR: AT6036521

hazard for lunar flight. With shielding of ~1 g/cm^2 the surface dose can reach ~10^4 rem from a high-intensity flare. If the cosmonaut stays in a radiation shelter during a solar flare, the obtained dose can be lowered to 50 rem or less. The probability of an intense solar flare during a period of maximum solar activity is around 10% (for a 30-day period). Doses from galactic space radiation and corpuscular radiation are determining factors on the lunar surface. The contribution to the total dose from natural and induced radiation is no more than several percent. However, doses from galactic space radiation and corpuscular radiation on the lunar surface are two times less than in space, due to shielding by the Moon itself.
[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06, 18, 22 / SUBM DATE: 00May66

Card 2/2

ACC NR: AP6011361 SOURCE CODE: UR/0208/66/006/002/0336/0342

AUTHOR: Kuznetsov, V. G. (Perm') 22 B

ORG: none

TITLE: Algorithms for finding general solutions to systems of linear inequalities

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 6, no. 2, 1966, 336-342

TOPIC TAGS: algebraic equation, linear equation, linear inequality

ABSTRACT: Algorithms are proposed for solving in a finite number of steps various systems of linear inequalities with real coefficients. Each successive algorithm essentially reduces to the first, which is an algorithm for a homogeneous system of rank n. The second is for a system of rank $r<n$, and the third for a nonhomogeneous system. The algorithms become unwieldy if the number of unknowns is large and therefore are recommended only if the general solution is desired. Orig. art. has: 25 formulas.

SUB CODE: 12/ SUBM DATE: 21May65/ ORIG REF: 006/ OTH REF: 002

UDC: 518:512.25

Card 1/1 MLP

KOLOTUKHIN, I.N.; KUZNETSOV, V.G.; KAZARNOVSKIY, S.N.; TSAREGRADSKIY, V.A.; PINCHUK, G.A., redaktor; VERINA, G.P., tekhnicheskiy redaktor

[Technology of lubricating and protective materials] Tekhnologiia smazochnykh i zashchitnykh materialov. Moskva, Gos. transportnoe zhel-dor. izd-vo, 1952, 235 p. [Microfilm]. (MLRA 8:7)
(Lubrication and lubricants) (Corrosion and anticorrosives) (Finishes and finishing)

VADENKIN, S.G., professor; KUZNETSOV, V.G., inzhener; KAZARNOVSKIY, S.N., inzhener.

Improving lacquers and paints. Standartizatsiia no.2:12-17 Mr-Ap '54. (MLRA 7:6)

1. TSentral'nyy nauchno-issledovatel'skiy institut Ministerstva putey soobshcheniya. (Paint materials--Standards)

KUZNETSOV, V.G., inzh.

Improving protection of railroad bridges from corrosion. Vest. TSNII MPS 17 no.1:9-12 F '58. (MIRA 11:3)
(Railroad bridges) (Protective coatings)

GENICH, B.A., kand.tekhn.nauk; KUZNETSOV, V.G., inzh.; AKBASHEV, B.Z.

Preventing fretting corrosion in roller bearing axle boxes.
Trudy TSNII MPS no.171:67-90 '59. (MIRA 13:1)
(Fretting corrosion) (Bearings(Machinery))
(Car wheels)

PHASE I BOOK EXPLOITATION SOV/4775

Kolotukhin, Ivan Nikiforovich, Vasiliy Georgiyevich Kuznetsov, Semen Naumovich Kazarnovskiy, and Vladimir Alekseyevich Tsaregradskiy

Tekhnologiya smazochnykh i zashchitnykh materialov (Technology of Lubricants and Protective Materials) 2nd ed., rev. and enl. Moscow, Transzheldorizdat, 1960. 146 p. 6,000 copies printed.

Ed.: G. A. Pinchuk, Candidate of Technical Sciences; Tech. Ed.: Ye. N. Bobrova.

PURPOSE: This textbook is intended for use in railroad-transportation tekhnikums and may also be used by workers occupied in painting and lubricating rolling stock.

COVERAGE: The authors discuss processes involved in the production of lubricating and protective materials for rolling stock. Attention is given to questions of the economic utilization of these materials in train maintenance. The second edition has

Card 1/7

undergone considerable revision and is supplemented with material on synthetic paints, various additives for improving lubricating materials, new varnishes and paints, and methods of applying these varnishes and paints. No personalities are mentioned. There are 46 references, all Soviet.

TABLE OF CONTENTS:

KOLOTUKHIN, Ivan Nikiforovich; KUZNETSOV, Vasiliy Georgiyevich; KAZARNOVSKIY, Semen Naumovich; TSAREGRADSKIY, Vladimir Alekseyevich; PINCHUK, G.A., kand.tekhn.nauk, red.; BOBROVA, Ye.N., tekhn.red.

[Technology of lubricants and protective coatings] Tekhnologiia smazochnykh i zashchitnykh materialov. Izd.2., perer. i dop. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1960. 146 p. (MIRA 13:9)
(Lubrication and lubricants) (Protective coatings)

31928
S/123/61/000/022/003/024
A004/A101

H.9100

AUTHOR: Kuznetsov, V.G.

TITLE: The effect of corrosion and lubricant composition on the contact strength of antifriction bearings

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 22, 1961, 32, abstract 22A245 ("Vestn. Vses. n.-i. in-ta zh.-d. transp.", 1961, no. 2, 36 - 40)

TEXT: Based on the investigation results the following conclusions are drawn: 1. The presence even of little corrosion on metallic contact surfaces (ШХ-15 [ShKh-15] grade steel) operating under conditions of rolling friction and high loads, as well as the saturation of lubricants in assemblies with moisture, considerably lowers the contact strength limit of these surfaces. 2) High-viscous lubricants inhibit the development of fatigue failure in the ShKh-15 grade steel to a greater degree than low-viscous ones. 3. A consistent lubricant, if it is well-retained in the friction assembly, prevents the rolling contact surfaces for a longer time from fatigue failure than liquid oil being

Card 1/2

The effect of corrosion ...

the constituent of the same lubricant. 4. The addition of anti-seizing and anti-wear additives to the lubricant composition makes it possible to retard contact-fatigue processes. There are 13 references.

[Abstracter's note: Complete translation]

Card 2/2

KOLOTUKHIN, Ivan Nikiforovich; KUZNETSOV, Vasiliy Georgiyevich; KAZARNOVSKIY, Semen Naumovich; TSAREGRADSKIY, Vladimir Alekseyevich; SARANTSEV, Yu.S., red.

[Lubricating and protective materials] Smazochnye i zashchitnye materialy. Izd.3., perer. i dop. [By] I.N.Kolotukhin, i dr. Moskva, Transport, 1965. 171 p. (MIRA 18:4)

ACC NR: AT6036554 SOURCE CODE: UR/0000/66/000/000/0157/0158

AUTHOR: Dudkin, V. Ye.; Kovalev, Ye. Ye.; Kuznetsov, V. G.; Smirennyy, L. N.

ORG: none

TITLE: The spatial distribution of doses of high-energy protons absorbed behind shielding [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 157-158

TOPIC TAGS: radiation shielding, radiation dosimetry, solar flare, cosmic radiation biologic effect, radiation protection

ABSTRACT: Measurements were made of dose distributions by depth behind a shield in a plane-parallel phantom during irradiation with 126-, 250-, 415-, and 660-Mev protons from an OIYAI synchrocyclotron. Measurements of absorbed doses were made with a spherical tissue-equivalent ionization chamber 2 cm in diameter equipped with a recording device permitting measurement of currents to 10^{-13} amp. Depth dose distributions in the phantom were obtained with "narrow" and "wide" proton beams normally incident on shielding with a thickness up to 50 g/cm^2.

Card 1/2

ACC NR: AT6036554

Depth distributions obtained in these experiments show that with increase in shielding thickness, an increase occurs in the surface-absorbed dose. This is explained by accumulation of nuclear reaction products in the shield and by increase of ionization losses of doses in the phantom. With large shielding thicknesses dose decrease occurs owing to increase in the number of protons eliminated in nuclear interactions. With decrease in the energy of incident protons the role of increase in ionization losses of protons behind the shield increases, while accumulation of secondary radiations behind the shield decreases.

The curve of mean tissue dose behind the shield behaves in the same manner. With small shielding thicknesses increase in the mean tissue dose with thickness is observed and then dose decrease with large thicknesses. For low incident proton energies (126 Mev) particle paths are completely contained in the phantom: therefore dose values drop with increase in shielding thickness. Experimental results were used to calculate depth dose distributions of protons from solar flares and the Earth's radiation belts with different shielding thicknesses. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2

ACC NR: AP7002408 SOURCE CODE: UR/0363/66/002/012/2241/2245

AUTHOR: Yeliseyev, A. A.; Kuznetsov, V. G.; Yarembash, Ye. I.; Vigileva, Ye. S.; Antonova, L. I.; Zinchenko, K. A.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences, SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: New phase in the system of tellurides of the rare earth metals of ceria subgroup

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 12, 1966, 2241-2245

TOPIC TAGS: compound semiconductor, rare earth metal, telluride, single crystal growing, crystal structure, crystal electric conductivity

ABSTRACT: The existence of the $M_4Te_{7\pm x}$ phase within the homogeneity limits between 61 and 64 at% Te was confirmed by chemical, x-ray spectrochemical, and x-ray phase analysis of poly- and single-crystalline M_4Te_7, where M = La, Pr, or Nd. Previously, the $M_4Te_{7\pm x}$ phase was detected by different Soviet authors but was absent in the La-Te and La-Nd phase diagrams which were published in the 1965 Western studies. The M_4Te_7 single crystals, 1 x 1 x 1 mm maximum size, were grown from polycrystalline M_2Te_3 by the chemical transport reaction with iodine at a 950—800C temperature gradient. Simultaneously, the MTe_2 single crystals were formed. The shape of the

Card 1/2

UDC: 546.65'241-54-162.2

ACC NR: AP7002408

La_4Te_7 and $LaTe_2$ single crystals was identical, while that of the Nd_4Te_7 and $NdTe_2$ was different. Lattice symmetry type and constants, space symmetry group, number of molecules in the unit cell, and x-ray density were determined and tabulated for La_4Te_7, Pr_4Te_7, and Nd_4Te_7. Lattice constants of Ce_4Te_7 were extrapolated from their plots versus ionic radii of the M^{3+} ions. La_4Te_7 was found to crystallize in a tetragonal not rhombic system, which was previously assigned to La_4Te_7 by the authors. The lattice constants of La_4Te_7 were found to be as follows: $a = b = 9.011 \pm 0.005$ Å, $c = 9.172 \pm 0.005$ Å. The most likely space symmetry group of La_4Te_7 was the centric P4/mbm group. Other $M_4Te_{7\pm x}$ tellurides of the ceria subgroup crystallize in the same system and have the same space symmetry group as La_4Te_7. Structural similarity and differences were noted between M_4Te_7 and MTe_2. Electrical conductivity and thermal emf of the M_4Te_7 phase was of the semiconductor type. The existence of the M_4Te_7 (or M_7Te_{12}) phase was presumed for Ce and Sm because of the crystallochemical analogy between tellurides of the ceria subgroup. Orig. art. has: 3 tables and 2 figures.

SUB CODE: 07/ SUBM DATE: 24Feb66/ ORIG REF: 008/ OTH REF: 004/

Card . 2/2

16(1)

AUTHOR: Kuznetsov, V.G.

TITLE: Conditions for the Equivalence of Systems of Linear Inequalities (Usloviya ekvivalentnosti sistem lineynykh neravenstv)

SOV/155-58-3-13/37

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 3, pp 71-74 (USSR)

ABSTRACT: The systems

(1) $a'_{j1}x_1 + a'_{j2}x_2 + \ldots + a'_{jn}x_n - a'_j \leqslant 0 \qquad j = 1,2,\ldots,m_1$

and

(2) $a''_{j1}x_1 + a''_{j2}x_2 + \ldots + a''_{jn}x_n - a'_j \leqslant 0 \qquad j = 1,2,\ldots,m_2$

with the same rank r are called equivalent if their solution polyhedra in the R^n are equal.

Theorem: (1) and (2) are equivalent then and only then if the minimal face sides of the solution polyhedra are equal and if the homogeneous systems arising from (1) and (2) by cancellation of the free terms are equivalent.

Theorem: The minimal face sides of the solution polyhedra M' and M" of (1) and (2) are equal then and only then if the maximal linear spaces L' and L" of the mentioned homogeneous systems are

Card 1/2

Conditions for the Equivalence of Systems of Linear Inequations SOV/155-58-3-13/37

equal and if further the intersections of the minimal face sides of M' and M" with the complement L^1 for $L = L' = L''$ are equal. The two theorems formulated without proof are used by the author for the proof of the equivalence or non-equivalence of two systems of inequations. The proof is simpler than that one proposed in [Ref 1]. There is 1 Soviet reference.

ASSOCIATION: Permskiy sel'skokhozyaystvennyy institut (Perm Agricultural Institute)

SUBMITTED: January 25, 1958

Card 2/2

39017

S/140/62/000/004/006/009
C111/C333

AUTHOR: Kuznetsov, V. G.

TITLE: A method for elimination of the unknown variables in the theory of the linear inequalities

PERIODICAL: Vysshiye uchebnyye zavedeniya. Izvestiya. Matematika, no. 4, 1962, 86-91

TEXT: The consistency of an inequality system and the determination of its solutions is investigated by aid of the elimination of the unknown variables. At first one points to the fact that in case all the elements of an arbitrary column of the coefficient matrix $\|a_{ji}\|$ of the system

$$a_{j1}x_1 + a_{j2}x_2 + \ldots + a_{jn}x_n - a_j \leq 0 \quad (j = 1,2,\ldots, m) \qquad (1)$$

are of the same sign, the system is certainly consistent and its solution can be found by fixing the unknown variables corresponding to the other columns and solving the remaining consistent system with one unknown variable. If in every column of $\|a_{ji}\|$ there appear coeffi-

Card 1/3

cients equal zero then one forms out of the rows where this does not happen, subsystems which then contain one or more unknown variables less and which are handled as above. Then one considers the case where each column of $\| a_{ji} \|$ contains elements with different signs. In this case (1) is split into three subsystems

$$x_1 + \frac{a_{j'2}}{a_{j'1}} x_2 + \cdots + \frac{a_{j'n}}{a_{j'1}} x_n - \frac{a_{j'}}{a_{j'1}} \leqslant 0 \quad (j' = 1, 2, \ldots, p), \qquad (1')$$

$$-x_1 - \frac{a_{j''2}}{a_{j''1}} x_2 - \cdots - \frac{a_{j''n}}{a_{j''1}} x_n + \frac{a_{j''}}{a_{j''1}} \leqslant 0 \quad (j'' = 1, 2, \ldots, q), \qquad (1'')$$

$$a_{j'''2} x_2 + \cdots + a_{j'''n} x_n - a_{j'''} \leqslant 0 \quad (j''' = 1, 2, \ldots, m - p - q). \qquad (1''')$$

and x_1 is eliminated by addition of each equation (1') to each equation (1"). The so obtained new inequalities form together with (1''') a new system. It is proved: The consistency of this new system is necessary and sufficient for the consistency of the system (1).

Card 2/3

A method for elimination of the . . . S/140/62/000/004/006/009
C111/C333

For the proof one uses results of H. W. Kuhn (Ref. 5: H. W. Kuhn. Solvability and consistency for linear equalities and inequalities. Amer. Math. Monthly, v. 63, no. 4, p.p. 217-232, 1956). The elimination method is continued until one comes up to a system with one unknown variable or with elements of the same sign in all columns. An example is calculated.

The author thanks S. N. Chernikov for the subject and for advices.

ASSOCIATION: Permskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Perm State University im. A. M. Gor'kiy)

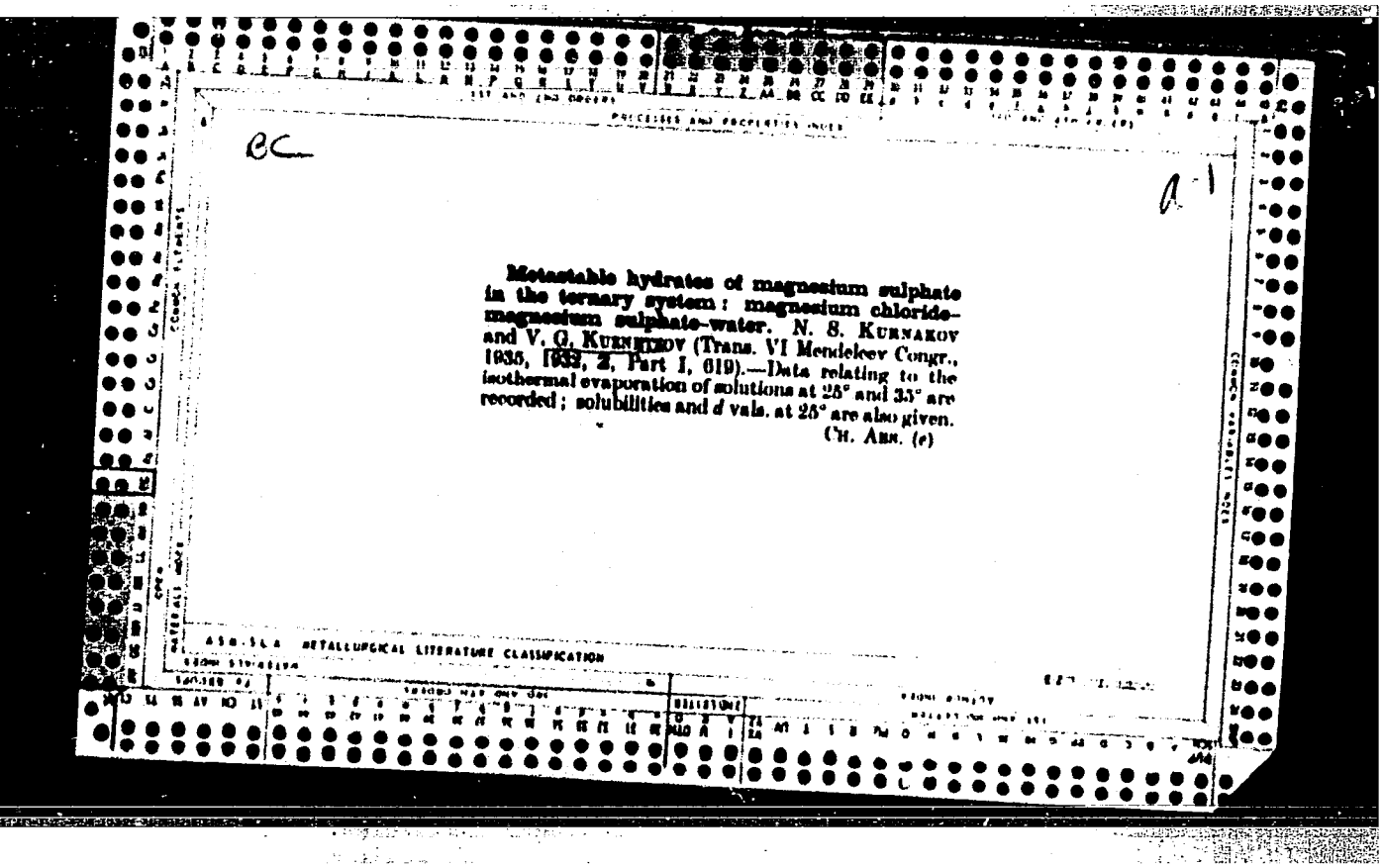
SUBMITTED: July 7, 1959

Card 3/3

KOZ'MIN, P.A.; KUZNETSOV, V.G.; POPOVA, Z.V.

Crystalline structure of (PyH) $HRe^{II}Br_4$. Zhur. strukt. khim. 6 no. 4:651-652 Jl-Ag '65 (MIRA 19:1)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova AN SSSR. Submitted February 1, 1965.



Metastable hydrates of magnesium sulphate in the ternary system: magnesium chloride–magnesium sulphate–water. N. S. KURNAKOV and V. G. KURNTSOV (Trans. VI Mendeleev Congr., 1935, [1932], 2, Part I, 619).—Data relating to the isothermal evaporation of solutions at 25° and 35° are recorded; solubilities and *d* vals. at 25° are also given.

(CH. ABS. (e))

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

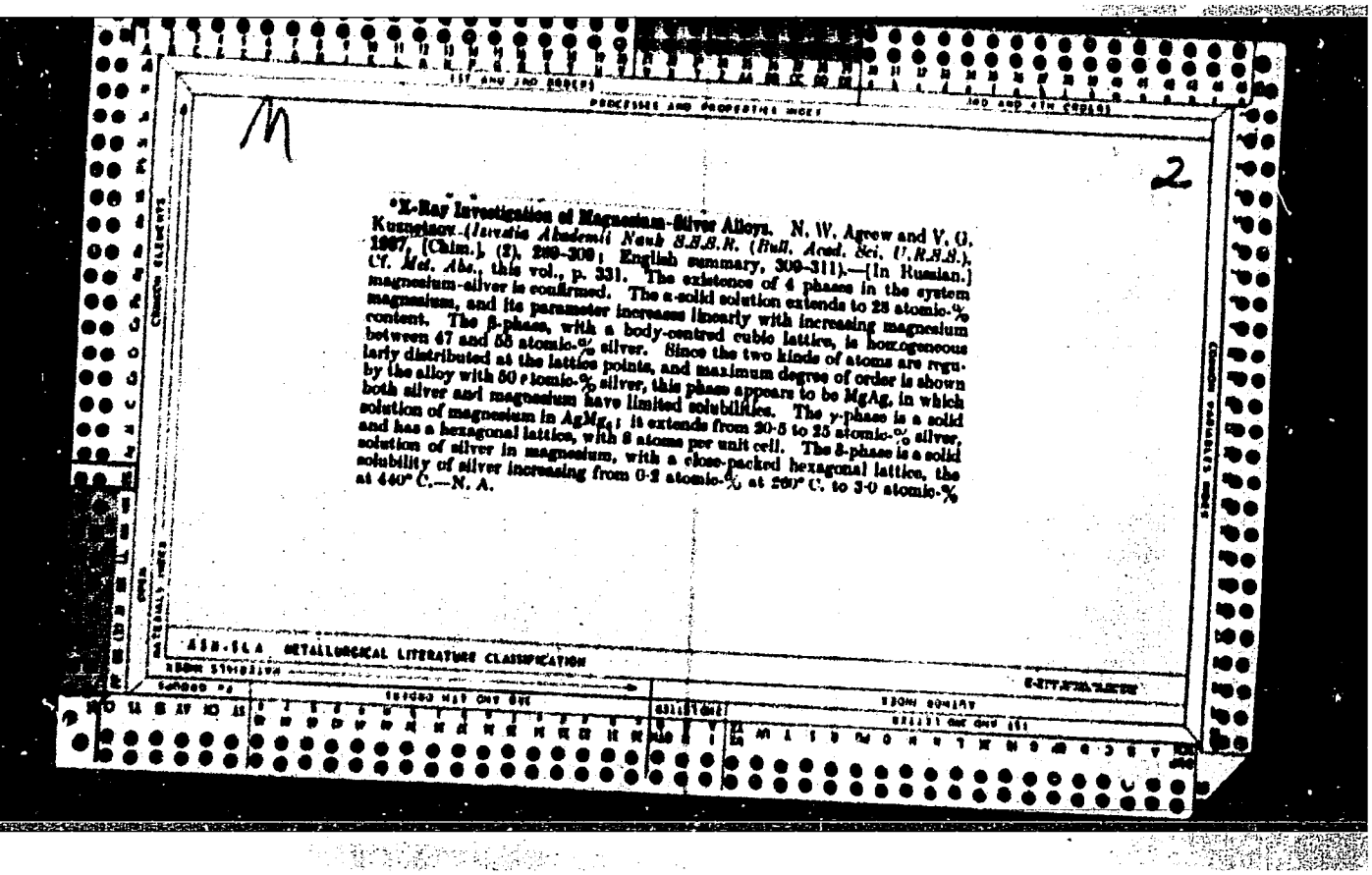
CA

2

PROCESSES AND PROPERTIES INDEX

Metastable hydrates of magnesium sulfate in the system magnesium chloride-magnesium sulfate-water. N. S. Kurnakov and V. G. Kuznetsov. *Ann. inst. anal. phys.-chim.* (U. S. S. R.) 7, 181-209(1935).—By increasing the concn. of $MgCl_2$ in the ternary system $MgCl_2$-$MgSO_4$-H_2O at 25° and 35° there are gradually crystd. the hydrates $MgSO_4.nH_2O$ (n = 7, 6, 5 or 4). A further dehydration without an increase of temp. does not take place even on inoculation with kieserite. The systems studied with hydrates $MgSO_4.5H_2O$ and $MgSO_4.4H_2O$ can be considered stable according to Ostwald and metastable according to the data of van't Hoff (*Untersuchungen über die Bildung der ozeanischen Salzablagerungen*, C. A. 6, 32[illegible]). For the solution of this contradiction, a further study of the vapor tensions of the ternary system in the presence of various hydrates in the solid phase is required. The data of Löwenherz (*Z. physik. Chem.* 13, 480(1894)) for the transition point with the solid phases $MgSO_4.7H_2O$ and $MgSO_4.6H_2O$ and the eutonic with solid phases $MgSO_4.H_2O$ and $MgCl_2.6H_2O$, as well as the data of Kurnakov and Zhemchuzhnuii (*C. A.* 17, 3271; 19, 43[illegible]) for the compn. of the eutonic with solid phases $MgCl_2.6H_2O$ and $MgSO_4.6H_2O$, relate to a different degree of metastability. The data of Blasdale (*C. A.* 14, 1084) on the eutonic with solid phases $MgSO_4.6H_2O$ and $MgCl_2.6H_2O$ actually relate to the solid phases $MgSO_4.4H_2O$ and $MgCl_2.6H_2O$. For economic recovery of $MgCl_2$ from brines satd. with $MgSO_4$ an addn. of $MgCl_2.6H_2O$ at about 50° with energetic stirring is recommended. By this procedure the content of $MgSO_4$ in the soln. can be reduced to 2.5% without the costs of evapn. Chas. Blanc

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



M

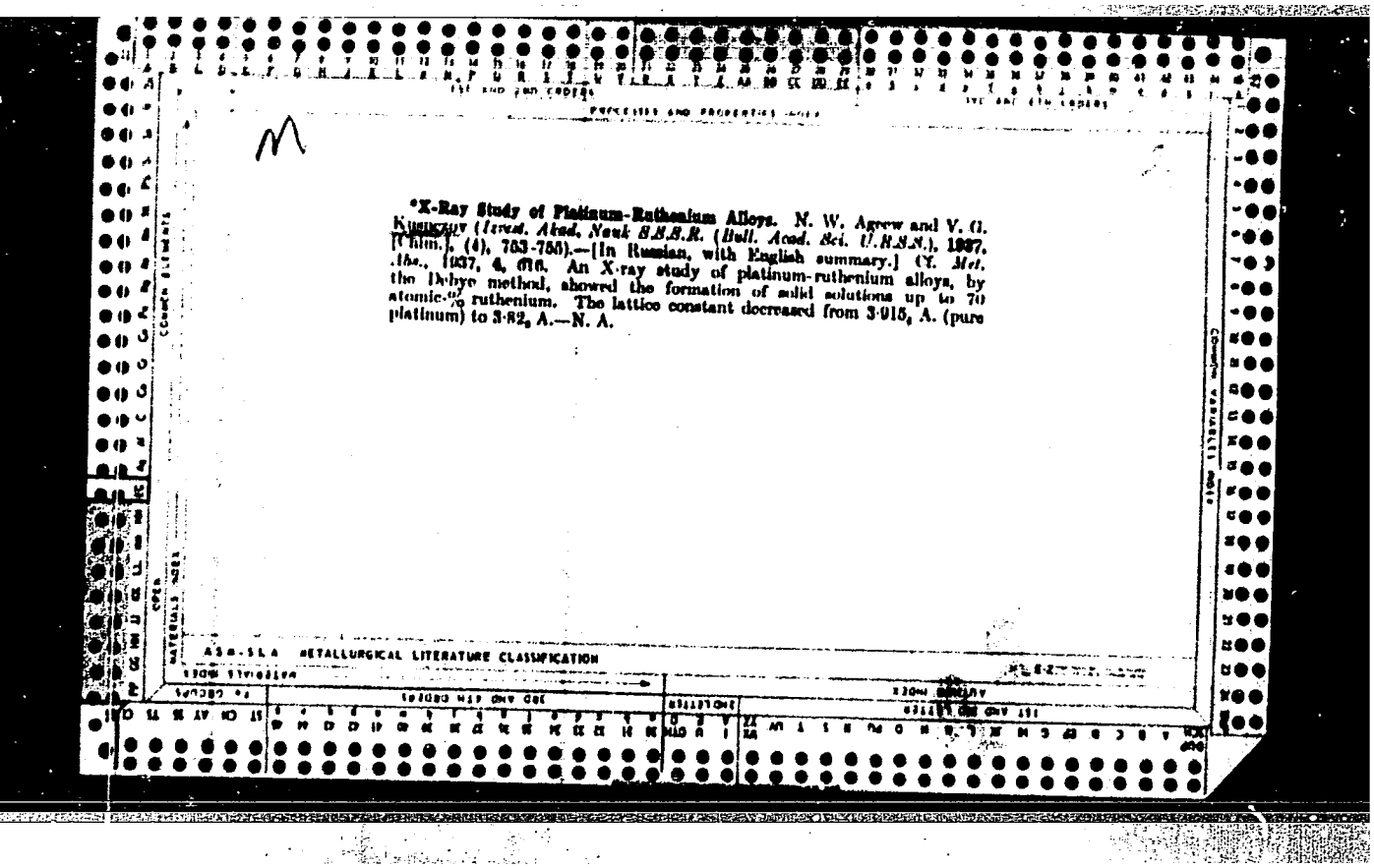
2

*X-Ray Investigation of Magnesium-Silver Alloys. N. W. Agrew and V. G. Kuznetsov. (*Izvestia Akademii Nauk S.S.S.R. (Bull. Acad. Sci. U.R.S.S.)*, 1937, [Chim.], (2), 289–309; English summary, 309–311).—[In Russian.] *Cf. Met. Abs.*, this vol., p. 331. The existence of 4 phases in the system magnesium-silver is confirmed. The α-solid solution extends to 28 atomic-% magnesium, and its parameter increases linearly with increasing magnesium content. The β-phase, with a body-centred cubic lattice, is homogeneous between 47 and 55 atomic-% silver. Since the two kinds of atoms are regularly distributed at the lattice points, and maximum degree of order is shown by the alloy with 50 atomic-% silver, this phase appears to be MgAg, in which both silver and magnesium have limited solubilities. The γ-phase is a solid solution of magnesium in $AgMg_4$; it extends from 20·5 to 25 atomic-% silver, and has a hexagonal lattice, with 8 atoms per unit cell. The δ-phase is a solid solution of silver in magnesium, with a close-packed hexagonal lattice, the solubility of silver increasing from 0·2 atomic-% at 269° C. to 3·0 atomic-% at 440° C.—N. A.

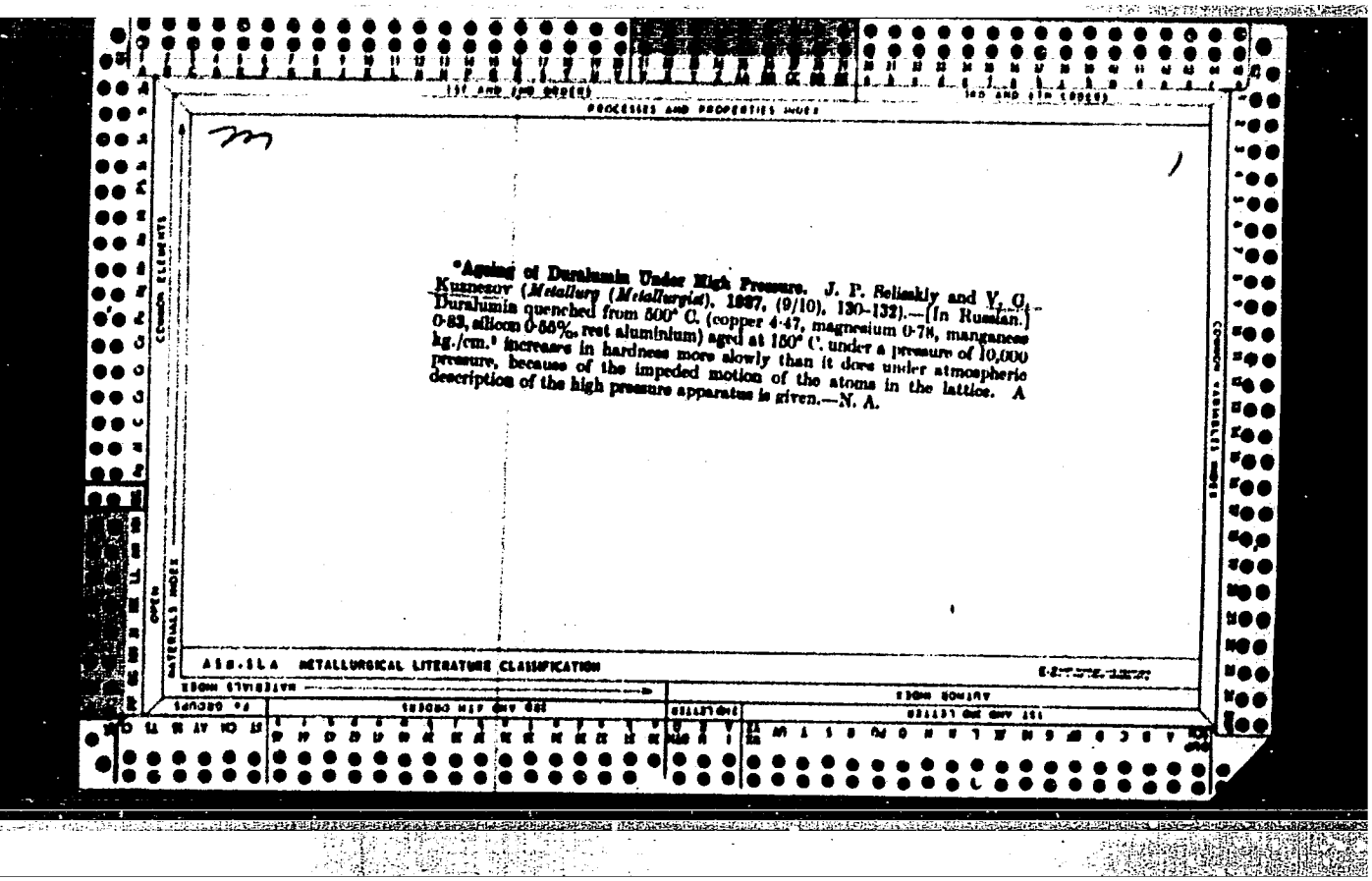
PROCESSING AND PROPERTIES INDEX

Polytherm of the triple system magnesium sulfate–magnesium chloride–water. V. G. Kuznetsov. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* 1937, 285-97 (in German 297-8). Sdy. isotherms of the system $MgSO_4$-$MgCl_2$-H_2O at 25° and 35° point to the presence in the solid phase of a consecutive series of $MgSO_4.nH_2O$ where n = 7, 6, 5 and 4. In the 35° isotherm the transition points appear at lower concns. of $MgCl_2$ than in the 25° isotherm. In both isotherms $MgSO_4.4H_2O$ and $MgSO_4.5H_2O$ are metastable with regard to kieserite but are stable with regard to $MgSO_4.6H_2O$. Kieserite is the most stable form, but the transformation of the metastable forms into it is very slow. Transformation of the hexa- into the penta- and tetra-hydrate proceeds much faster; nevertheless, it takes several days of continuous stirring in the presence of the more stable phase. Thirteen references. S. L. Madorsky

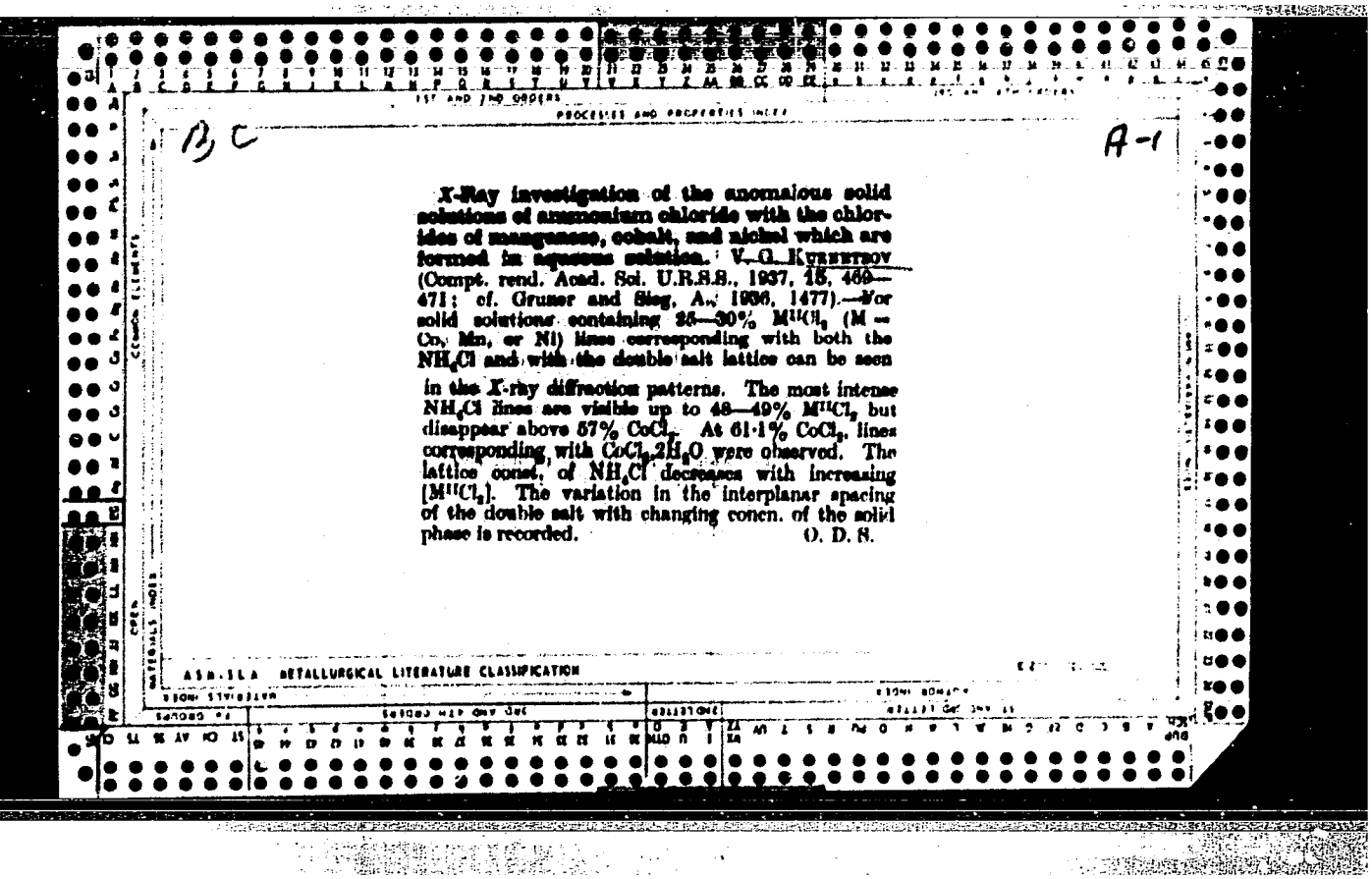
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



***X-Ray Study of Platinum-Ruthenium Alloys.** N. W. Agrew and V. G. Kuznetsov (*Izvest. Akad. Nauk S.S.S.R. (Bull. Acad. Sci. U.R.S.S.), Phys.*, (4), 783-788).—[In Russian, with English summary.] (*Z. Met., Abs.*, 1937, **4**, 616. An X-ray study of platinum-ruthenium alloys, by the Debye method, showed the formation of solid solutions up to 70 atomic-% ruthenium. The lattice constant decreased from 3·915$_5$ A. (pure platinum) to 3·82$_8$ A.—N. A.



***Ageing of Duralumin Under High Pressure.** J. P. Seliskly and V. G. Kuznesov (*Metallury* (*Metallurgia*), 1937, (9/10), 130–132).—[In Russian.] Duralumin quenched from 500° C. (copper 4·47, magnesium 0·78, manganese 0·83, silicon 0·58%, rest aluminium) aged at 150° C. under a pressure of 10,000 kg./cm.² increases in hardness more slowly than it does under atmospheric pressure, because of the impeded motion of the atoms in the lattice. A description of the high pressure apparatus is given.—N. A.

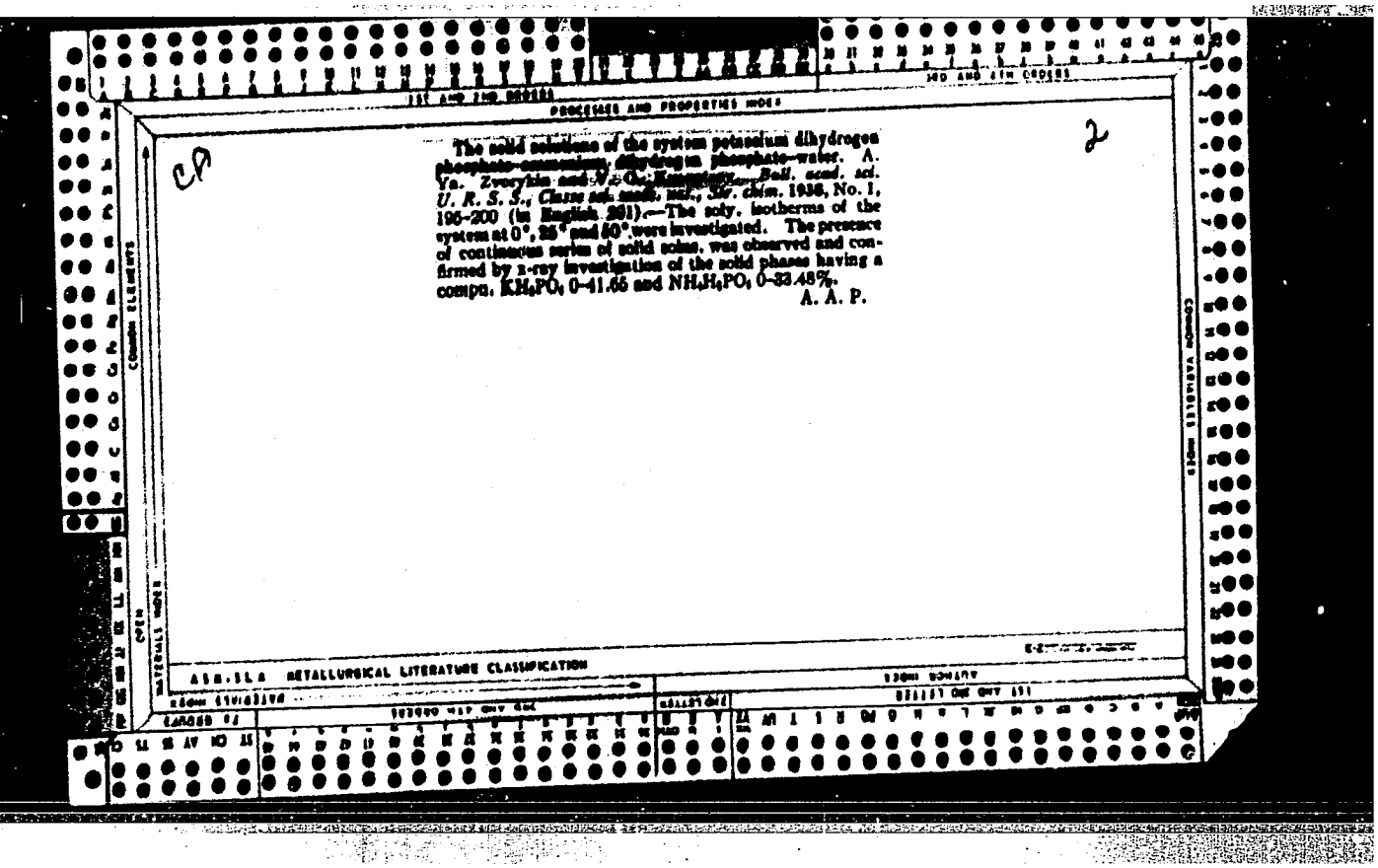


B, C

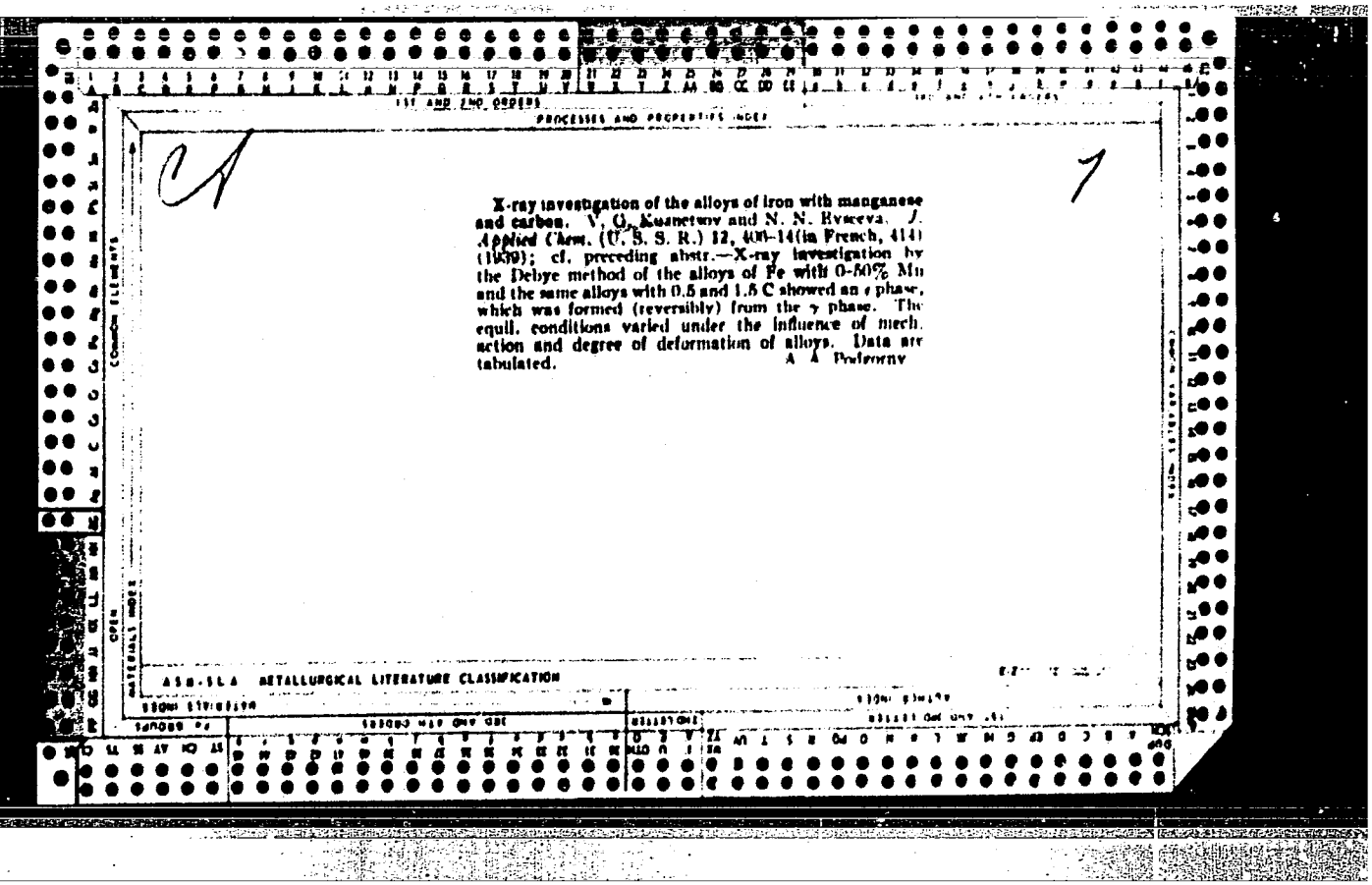
A-1

X-Ray investigation of the anomalous solid solutions of ammonium chloride with the chlorides of manganese, cobalt, and nickel which are formed in aqueous solution. V. G. KUZNETSOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 469—471; cf. Gruner and Slog, A., 1936, 1477).—For solid solutions containing 25—30% MCl_2 (M = Co, Mn, or Ni) lines corresponding with both the NH_4Cl and with the double salt lattice can be seen in the X-ray diffraction patterns. The most intense NH_4Cl lines are visible up to 48—49% MCl_2 but disappear above 57% $CoCl_2$. At 61·1% $CoCl_2$, lines corresponding with $CoCl_2.2H_2O$ were observed. The lattice const. of NH_4Cl decreases with increasing $[MCl_2]$. The variation in the interplanar spacing of the double salt with changing concn. of the solid phase is recorded. O. D. S.

A.S.T.M. METALLURGICAL LITERATURE CLASSIFICATION



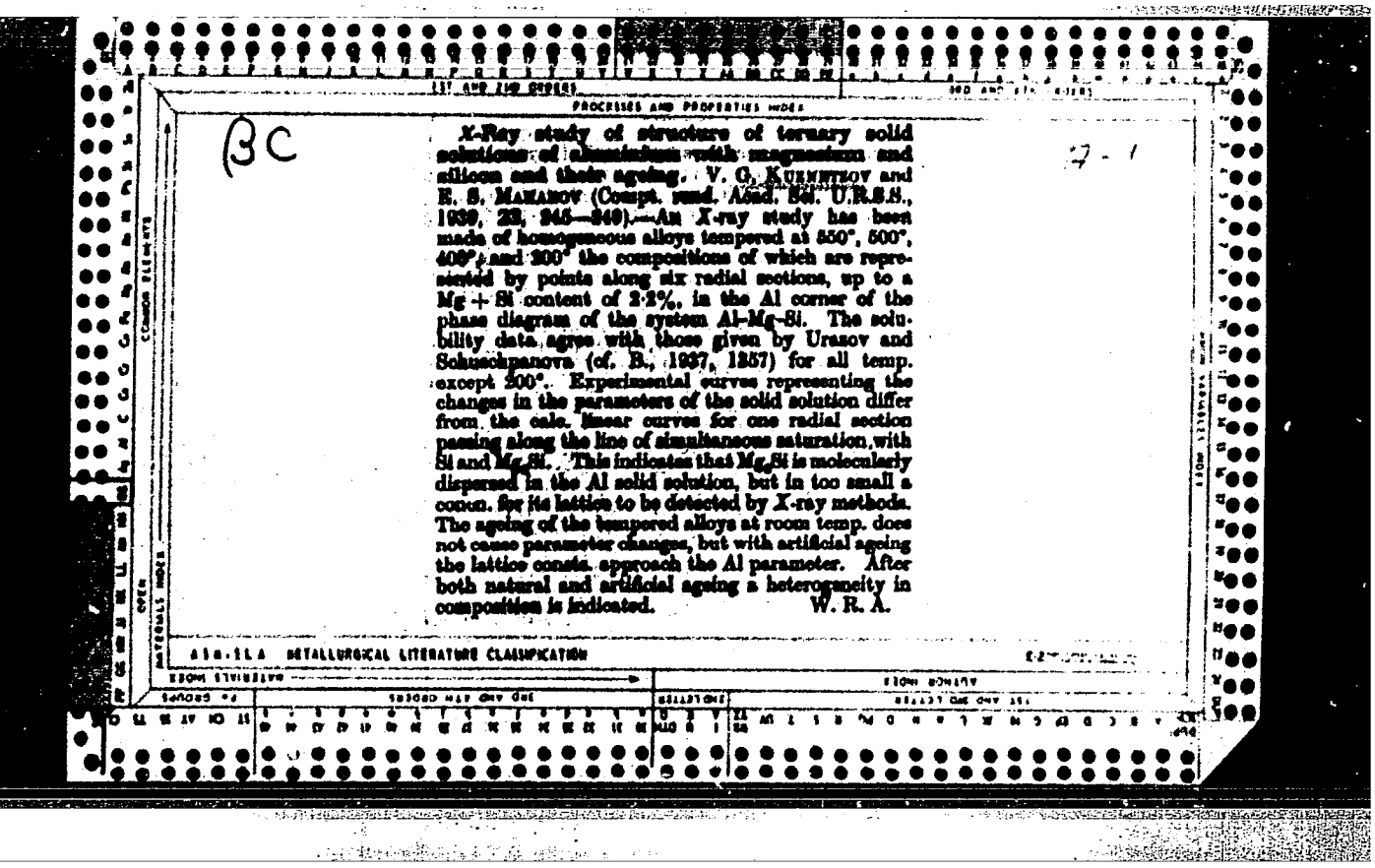
The solid solutions of the system potassium dihydrogen phosphate-ammonium dihydrogen phosphate-water. A. Ya. Zvorykin and V. G. Khmelnitzkii. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* 1938, No. 1, 195-200 (in English. 201).—The solv. isotherms of the system at 0°, 25° and 40° were investigated. The presence of continuous series of solid solns. was observed and confirmed by x-ray investigation of the solid phases having a compn. KH_2PO_4 0-41.65 and $NH_4H_2PO_4$ 0-33.48%.
A. A. P.



X-ray investigation of the alloys of iron with manganese and carbon. V. G. Kuznetsov and N. N. Rybaeva. *J. Applied Chem.* (U. S. S. R.) 12, 409–14 (in French, 414) (1939); cf. preceding abstr.—X-ray investigation by the Debye method of the alloys of Fe with 0–50% Mn and the same alloys with 0.5 and 1.5 C showed an ε phase, which was formed (reversibly) from the γ phase. The equil. conditions varied under the influence of mech. action and degree of deformation of alloys. Data are tabulated.

A. A. Prolowny

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



BC

X-Ray study of structure of ternary solid solutions of aluminium with magnesium and silicon and their ageing. V. G. KURNETSOV and E. S. MAKAROV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 245—249).—An X-ray study has been made of homogeneous alloys tempered at 550°, 500°, 400°, and 200° the compositions of which are represented by points along six radial sections, up to a Mg + Si content of 2·2%, in the Al corner of the phase diagram of the system Al–Mg–Si. The solubility data agree with those given by Urazov and Schuschpanova (cf. B., 1937, 1357) for all temp. except 200°. Experimental curves representing the changes in the parameters of the solid solution differ from the calc. linear curves for one radial section passing along the line of simultaneous saturation with Si and Mg_2Si. This indicates that Mg_2Si is molecularly dispersed in the Al solid solution, but in too small a concn. for its lattice to be detected by X-ray methods. The ageing of the tempered alloys at room temp. does not cause parameter changes, but with artificial ageing the lattice consts. approach the Al parameter. After both natural and artificial ageing a heterogeneity in composition is indicated. W. R. A.

1ST AND 2ND ORDERS

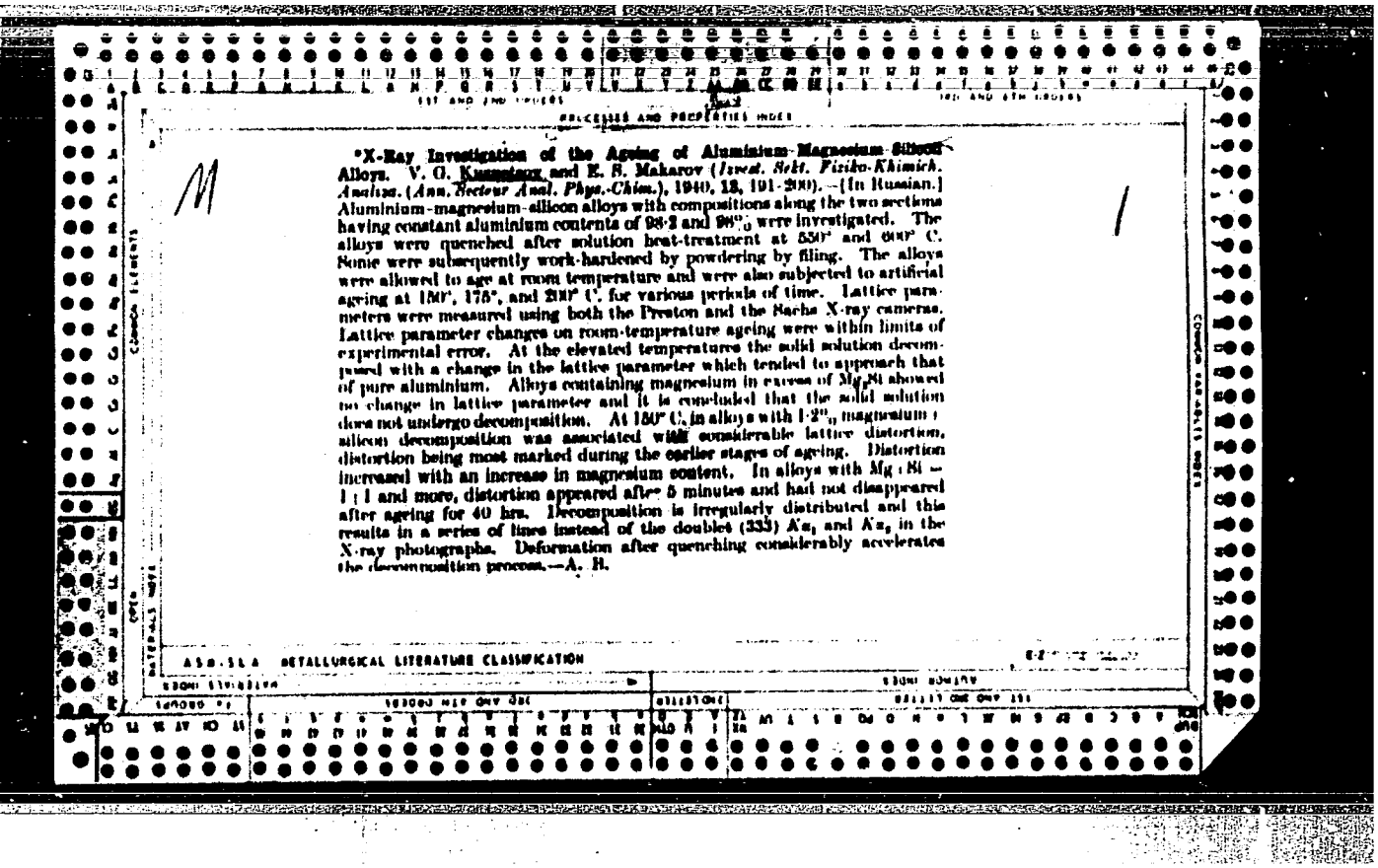
PROCESSES AND PROPERTIES INDEX

2

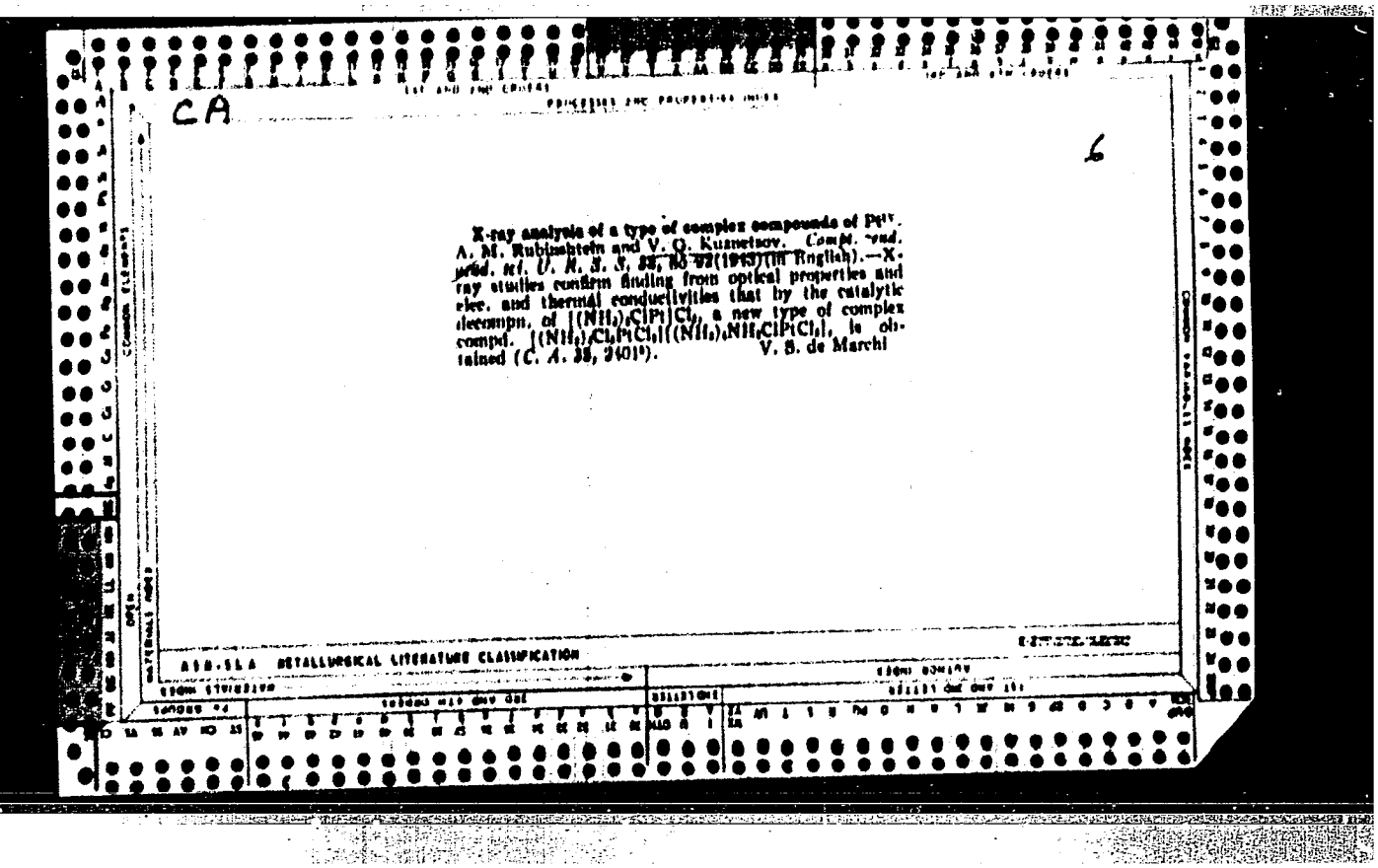
X-Ray Investigation of the Aluminium-Rich Al-Mg-Cu Alloys. V. G. Kuznetsov and L. N. Guseva (*Izvest. Akad. Nauk S.S.S.R.* (*Bull. Acad. Sci. U.R.S.S.*), **1940**, [Chim.], (6), 905-928).—[In Russian.] The Debye X-ray powder method, supplemented by microscopic examination, was used to determine the phases 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: $\alpha + CuAl_2$, $\alpha + CuAl_2 + L$, $\alpha + L$, $\alpha + L + T$, $\alpha + T$, $\alpha + T + Al_3Mg_2$, and $\alpha + Al_3Mg_2$, where L is the compound $Al_5Cu_6Mg_2$ and T is Al_6CuMg_4. When the temperature is lowered to 200° C. the two-phase regions shrink, while the three-phase regions, especially the $\alpha + T + Al_3Mg_2$ region, expand. In alloys of the Duralumin type (small iron content), it is the $CuAl_2$ and $Al_2Cu_2Mg_2$ compounds that are responsible for precipitation-hardening. The maximum effect should be obtained in alloys with up to 0·8% magnesium and 3·6-4·2% copper on quenching from 500° C.—A. B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Roentgenographic determination of structure of ternary solid solutions of magnesium, silicon, and aluminum. V. O. Kuznetsov and B. B. Makarov. *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei & Neorg. Khim.*, 13, 177-90 (1940); *Khim. Referat. Zhur.*, 4 [9] 35-36 (1941).—Using the precision method of Preston, the authors determined the parameters of the lattice of the ternary solid solution Al-Mg-Si for 6 radial cuts starting at Al and going toward the side Mg-Si up to 2.2 wt. % (Mg+Si) as well as for Al-Si alloys up to 2.2 wt. % Si. Isotherms were constructed for the solubility of Mg and Si in Al at 550°, 500°, 400°, and 200°. The solubility of Mg and Si in Al at 200° is not more than 0.1% of the sum (Mg + Si) of the region delineated by the system Al-Si-Mg_2Si. The difference in the nature of experimental and calculated curves for the parameters of the lattice, assuming an atomic structure of a solid solution for alloys annealed from 550°, leads to the belief that the solid solution Al-Mg_2Si is molecular in its structure. On Debye diagrams of alloys annealed after heating at 550° and 200°, only lines corresponding to the lattice of Al were observed. Annealed and slowly cooled alloys containing 2.2% of Mg + Si and located on the pseudobinary and adjacent sections show, on Debye diagrams, weak additional lines corresponding to the lattice Mg_2Si. M. Ho



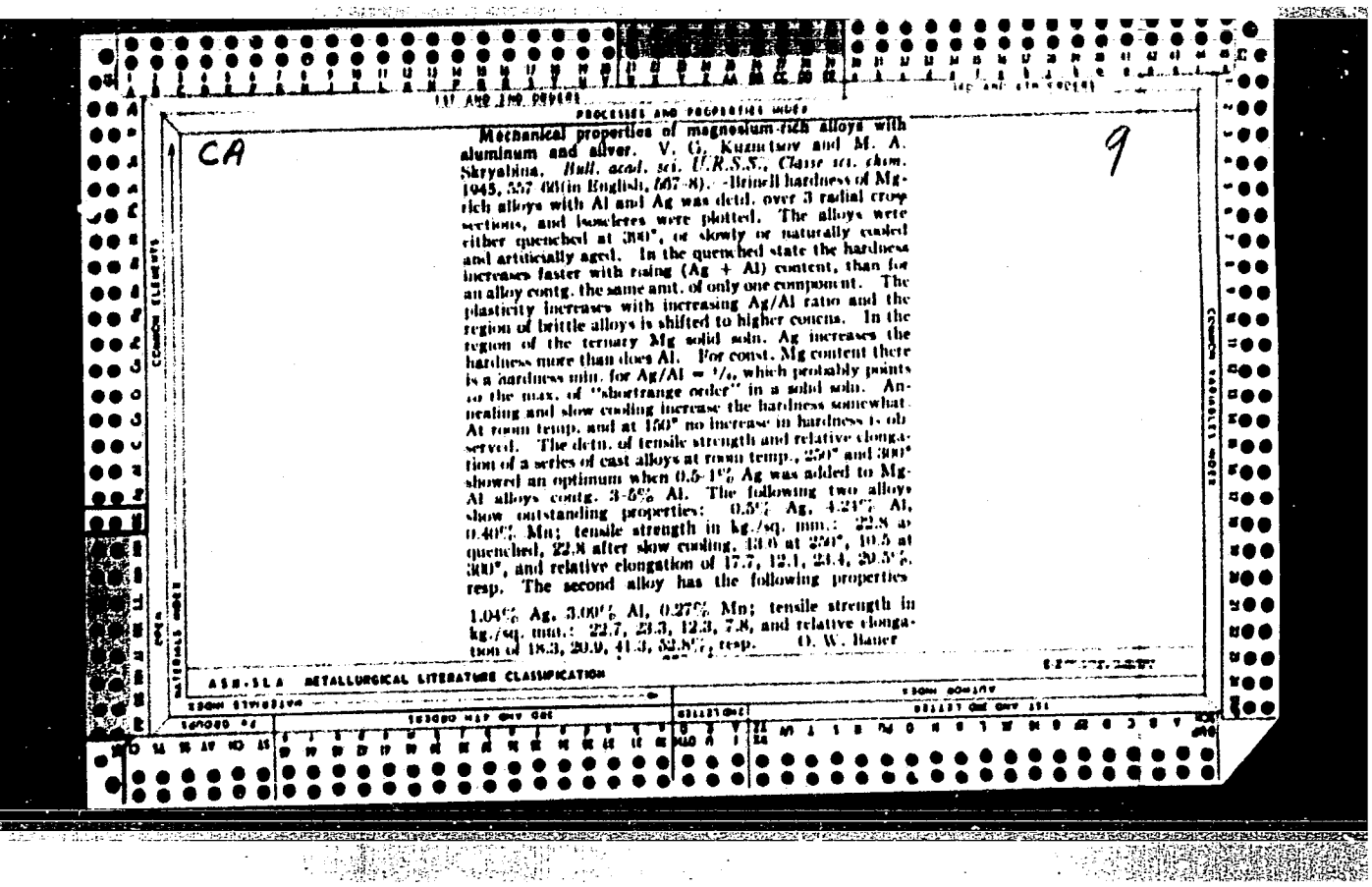
*X-Ray Investigation of the Ageing of Aluminium-Magnesium-Silicon Alloys. V. G. Kuznetsov and K. S. Makarov (*Izvest. Sekt. Fiziko-Khimich. Analiza.* (*Ann. Secteur Anal. Phys.-Chim.*), 1940, 13, 191-200). —[In Russian.] Aluminium-magnesium-silicon alloys with compositions along the two sections having constant aluminium contents of 98·2 and 98% were investigated. The alloys were quenched after solution heat-treatment at 550° and 600° C. Some were subsequently work-hardened by powdering by filing. The alloys were allowed to age at room temperature and were also subjected to artificial ageing at 150°, 175°, and 200° C. for various periods of time. Lattice parameters were measured using both the Preston and the Sachs X-ray cameras. Lattice parameter changes on room-temperature ageing were within limits of experimental error. At the elevated temperatures the solid solution decomposed with a change in the lattice parameter which tended to approach that of pure aluminium. Alloys containing magnesium in excess of Mg_2Si showed no change in lattice parameter and it is concluded that the solid solution does not undergo decomposition. At 150° C. in alloys with 1·2% magnesium + silicon decomposition was associated with considerable lattice distortion, distortion being most marked during the earlier stages of ageing. Distortion increased with an increase in magnesium content. In alloys with Mg : Si = 1 : 1 and more, distortion appeared after 5 minutes and had not disappeared after ageing for 40 hrs. Decomposition is irregularly distributed and this results in a series of lines instead of the doublet (333) A'_1 and A'_2 in the X-ray photographs. Deformation after quenching considerably accelerates the decomposition process.—A. B.



CA

6

X-ray analysis of a type of complex compounds of Pt[IV]. A. N. Rubinshtein and V. O. Kuznetsov. *Compt. rend. acad. sci. U. R. S. S.* 28, No 9 2(1940)(In English).—X-ray studies confirm finding from optical properties and elec. and thermal conductivities that by the catalytic decompn. of $[(NH_3)_4ClPtCl]Cl_2$, a new type of complex compd. $[(NH_3)_4Cl_2PtCl_2][(NH_3)_4NH_2ClPtCl_2]$, is obtained (*C. A.* 35, 2401[9]). V. S. de Marchi

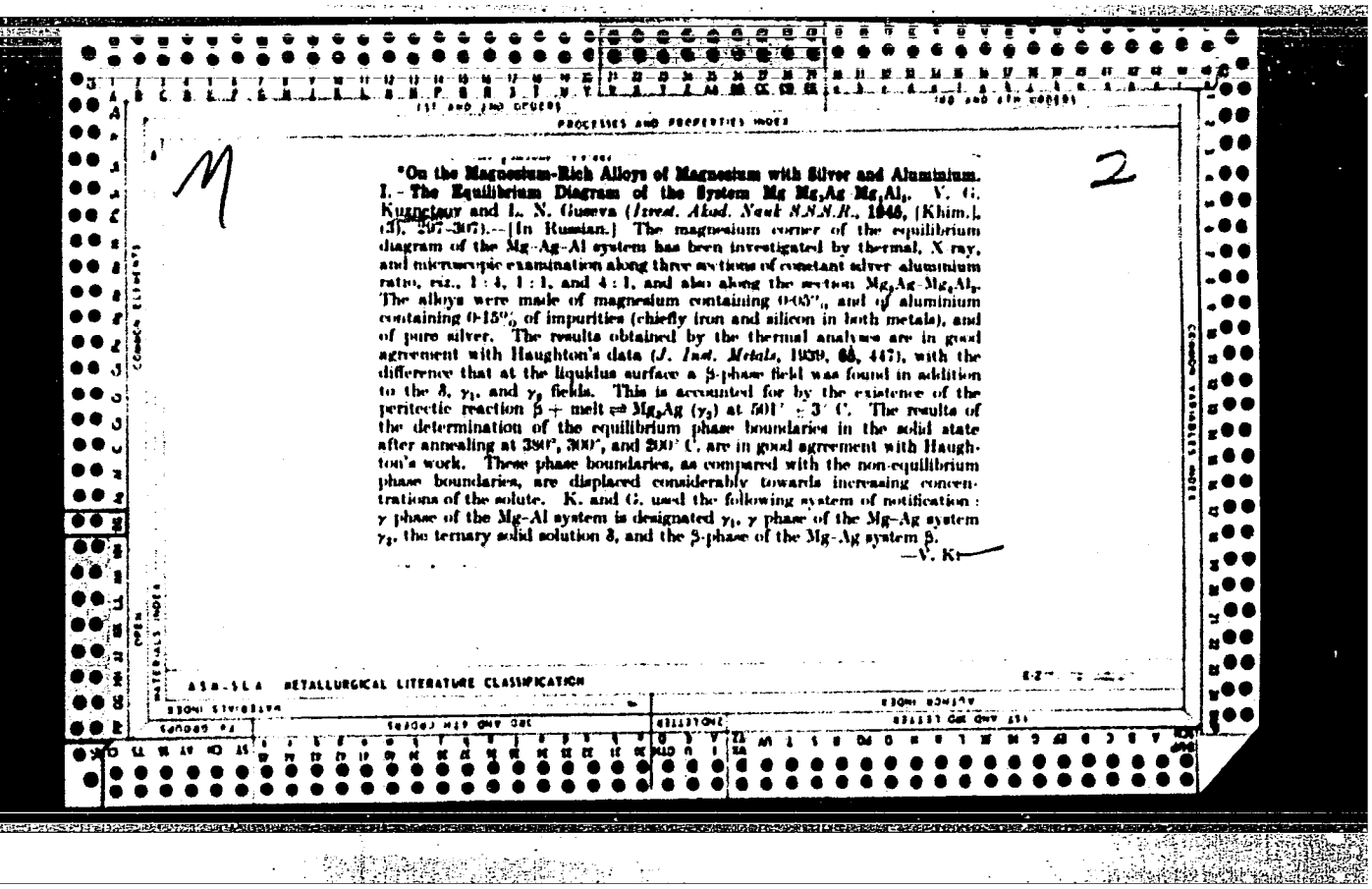


CA

9

Mechanical properties of magnesium-rich alloys with aluminum and silver. V. G. Kuznetsov and M. A. Skryabina. *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1945, 557-68 (in English, 567-8). -Brinell hardness of Mg-rich alloys with Al and Ag was detd. over 3 radial cross sections, and isoscleres were plotted. The alloys were either quenched at 380°, or slowly or naturally cooled and artificially aged. In the quenched state the hardness increases faster with rising (Ag + Al) content, than for an alloy contg. the same amt. of only one component. The plasticity increases with increasing Ag/Al ratio and the region of brittle alloys is shifted to higher concns. In the region of the ternary Mg solid soln. Ag increases the hardness more than does Al. For const. Mg content there is a hardness min. for Ag/Al = 1/1, which probably points to the max. of "shortrange order" in a solid soln. Annealing and slow cooling increase the hardness somewhat. At room temp. and at 150° no increase in hardness is observed. The detn. of tensile strength and relative elongation of a series of cast alloys at room temp., 250° and 380° showed an optimum when 0.5-1% Ag was added to Mg-Al alloys contg. 3-5% Al. The following two alloys show outstanding properties: 0.5% Ag, 4.21% Al, 0.40% Mn; tensile strength in kg./sq. mm.: 22.8 as quenched, 22.8 after slow cooling, 13.0 at 250°, 10.5 at 380°, and relative elongation of 17.7, 12.1, 21.4, 20.5%, resp. The second alloy has the following properties 1.04% Ag, 3.00% Al, 0.27% Mn; tensile strength in kg./sq. mm.: 22.7, 23.3, 12.3, 7.8, and relative elongation of 18.3, 20.9, 41.3, 52.8%, resp. O. W. Bauer

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

M

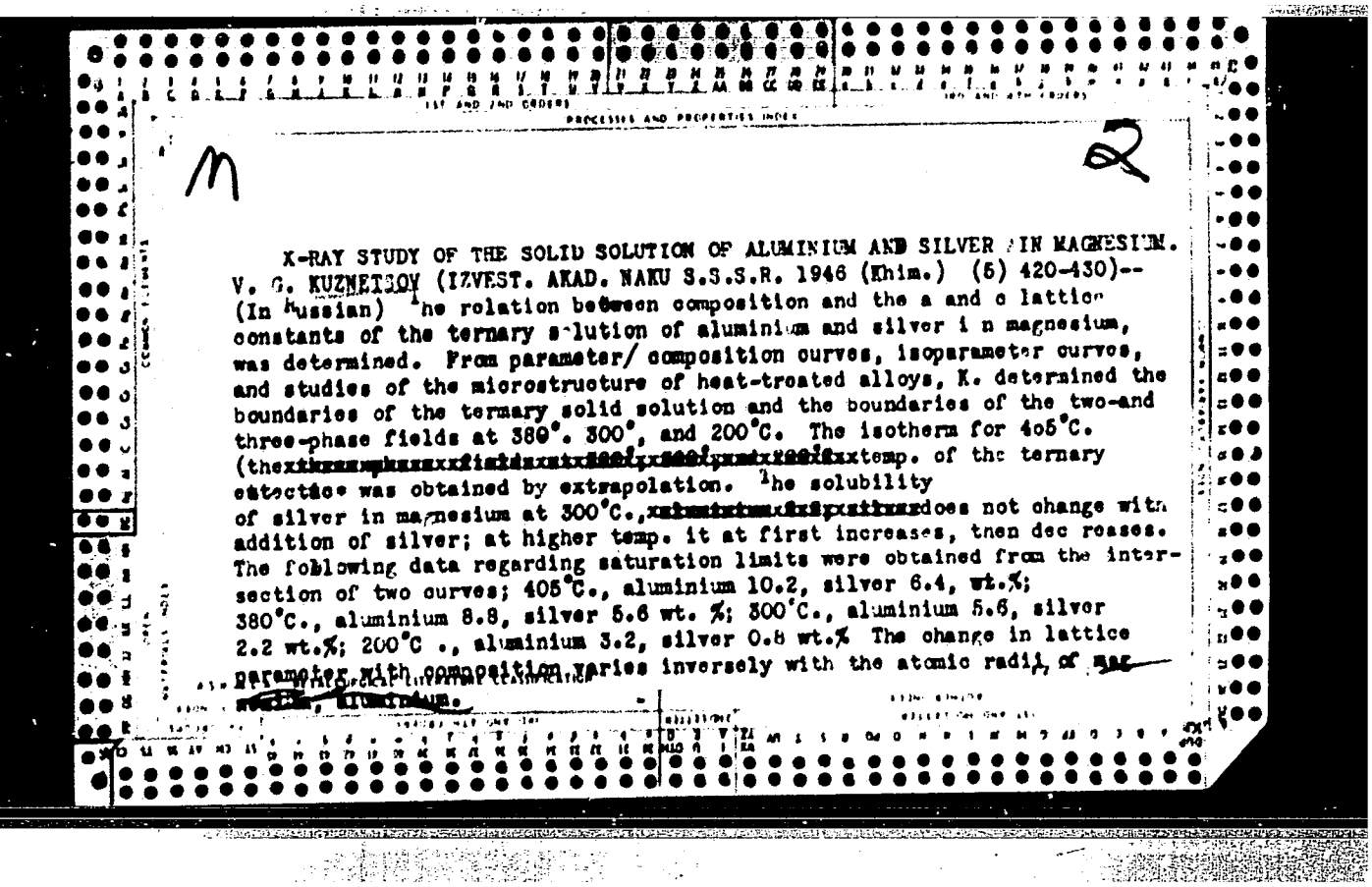
2

On the Magnesium-Rich Alloys of Magnesium with Silver and Aluminium. I. - The Equilibrium Diagram of the System Mg Mg_2Ag Mg_2Al_3. V. G. Kurnetsov and L. N. Guseva (*Izvest. Akad. Nauk S.S.S.R.*, 1946, [Khim.], (3), 297–307).—[In Russian.] The magnesium corner of the equilibrium diagram of the Mg–Ag–Al system has been investigated by thermal, X ray, and microscopic examination along three sections of constant silver aluminium ratio, viz., 1 : 4, 1 : 1, and 4 : 1, and also along the section Mg_2Ag–Mg_2Al_3. The alloys were made of magnesium containing 0·05% and of aluminium containing 0·15% of impurities (chiefly iron and silicon in both metals), and of pure silver. The results obtained by the thermal analyses are in good agreement with Haughton's data (*J. Inst. Metals*, 1939, **65**, 447), with the difference that at the liquidus surface a β-phase field was found in addition to the δ, γ_1, and γ_2 fields. This is accounted for by the existence of the peritectic reaction β + melt ⇌ Mg_2Ag (γ_2) at 501° ± 3° C. The results of the determination of the equilibrium phase boundaries in the solid state after annealing at 380°, 300°, and 200° C. are in good agreement with Haughton's work. These phase boundaries, as compared with the non-equilibrium phase boundaries, are displaced considerably towards increasing concentrations of the solute. K. and G. used the following system of notification: γ phase of the Mg–Al system is designated γ_1, γ phase of the Mg–Ag system γ_2, the ternary solid solution δ, and the β-phase of the Mg–Ag system β.

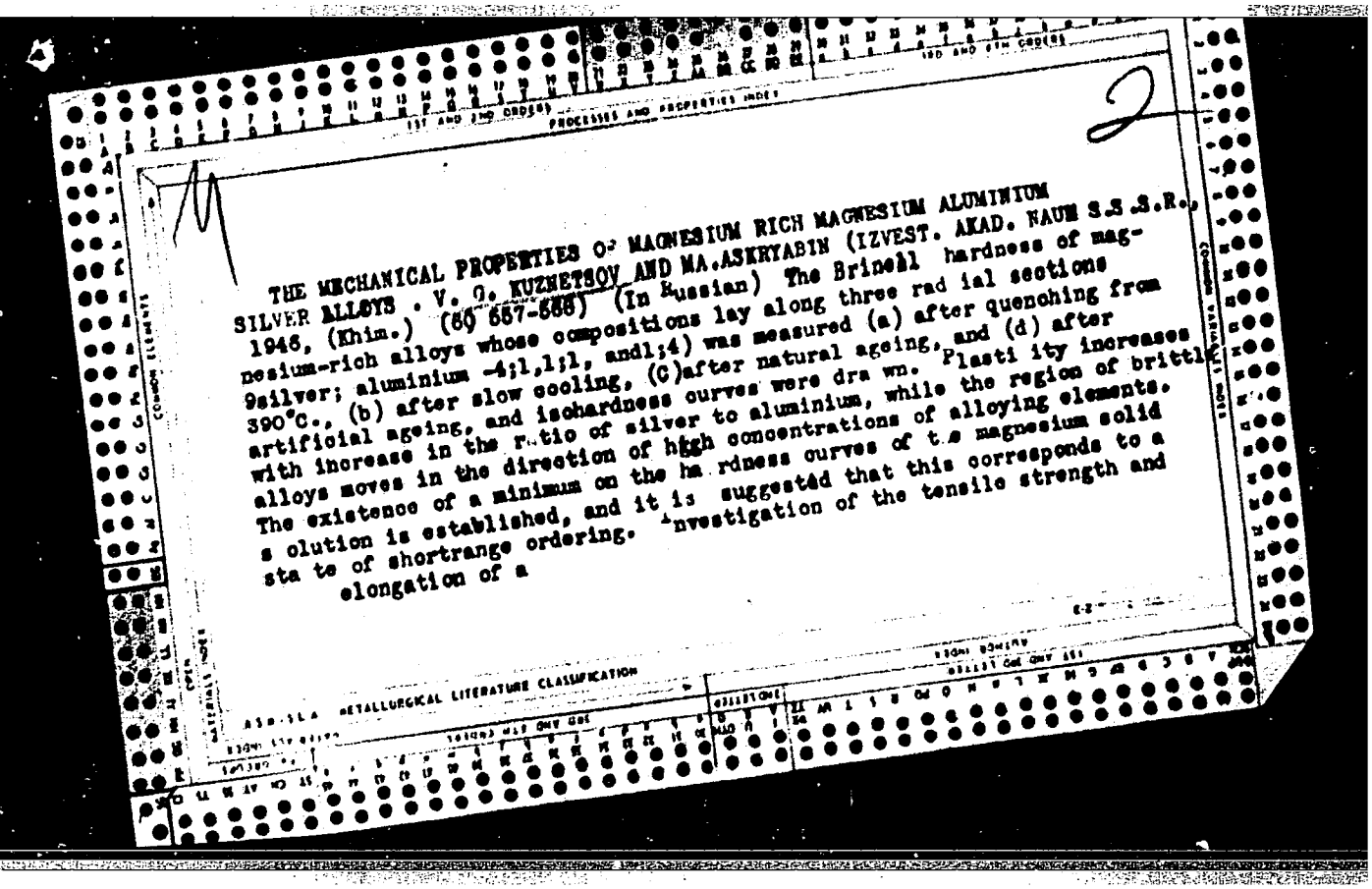
—V. Kr

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Structural relations between zeolites and natural kaolin and their transformations on heating. V. N. Svezhnikova and V. O. Kuznetsov (N. S. Kurnakov Inst. Gen. Inorg. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R. Otdel. Khim. Nauk* 1949, 25-30.—Thermographic and x-ray examns. were made on: (I) cryst. aluminosilicate zeolite, approx. $Na_2O.Al_2O_3.2SiO_2.2H_2O$ (Na_2O 19.21, Al_2O_3 29.41, SiO_2 [illegible], H_2O 16.75%), (II) amorphous zeolite, approx. $Na_2O.Al_2O_3.3SiO_2.4H_2O$ (14.03, 23.49, 38.90, [illegible]), (III) electrodialyzed cryst. aluminosilicate (by electrodialysis of I), approx. 0.1 $Na_2O.Al_2O_3.2SiO_2.nH_2O$ (3.7, [illegible], [illegible], 27.71), and (IV) kaolin $H_2Al_2Si_2O_8.H_2O$. Thermography of I shows an endothermal effect of dehydration beginning at 100° and ending at 350° and 2 exothermal effects at 805° and 900°. II and III both give the same endothermal effect 100-350°, max. at 160°, and an exothermal effect around 900°. Kaolin loses H_2O between 380 and 640°, max. at 505°, and has 2 exothermal effects at 960 and at 1200°. Thus, artificial zeolites give up H_2O at a considerably lower temp. than kaolin. On the x-ray diagrams all lines of III are present also in IV, but some weaker lines of IV are absent in III; hence, III and IV are structurally analogous, except that the lattice of III is somewhat larger, possibly owing to formation of solid solns. Both III and IV become amorphous after heating to 800°. Evidently, in both III and IV, not all the H_2O is zeolitic; part of the H_2O is bound so firmly that its elimination results in destruction of the crystal lattice. III heated at 1100° for 3 hrs. and IV heated at the same temp. for 48 hrs. showed similar patterns rather close to sillimanite (but not to mullite). This structure becomes apparent in III after 2 hrs. heating but in IV not before 24 hrs.; 3 hrs. heating at 1100° of IV fails to reveal any lines; after 6 hrs. lines of γ-Al_2O_3 are found, the crystallites reaching sizes of $10^{-[illegible]}$-10^{-6} cm.; evidently, on further prolonged heating at that temp., γ-Al_2O_3 reacts with SiO_2 to form sillimanite. In III, the same processes occur much faster. No lines were found on diagrams of II, air-dry or heated at 800°, but II heated at 1100°, 8 hrs., showed a diagram almost identical with that of III after the same heat-treatment, except for the absence of some minor lines of III and a somewhat lower intensity. Hence, II heated at 1100° also forms a sillimanitic lattice. I, air-dry, gives a pattern different from both III and IV, and not identical with either thomsonite or natrolite. Dehydration at 800° does not change the pattern; hence, in I the H_2O is bound zeolitically, and its removal does not perturb the lattice. Heating of I to 960° and 1100° gives rise to new lines, not identical with either those of γ-Al_2O_3 or of sillimanite. The origin of these new lines is not yet elucidated. N. Thon



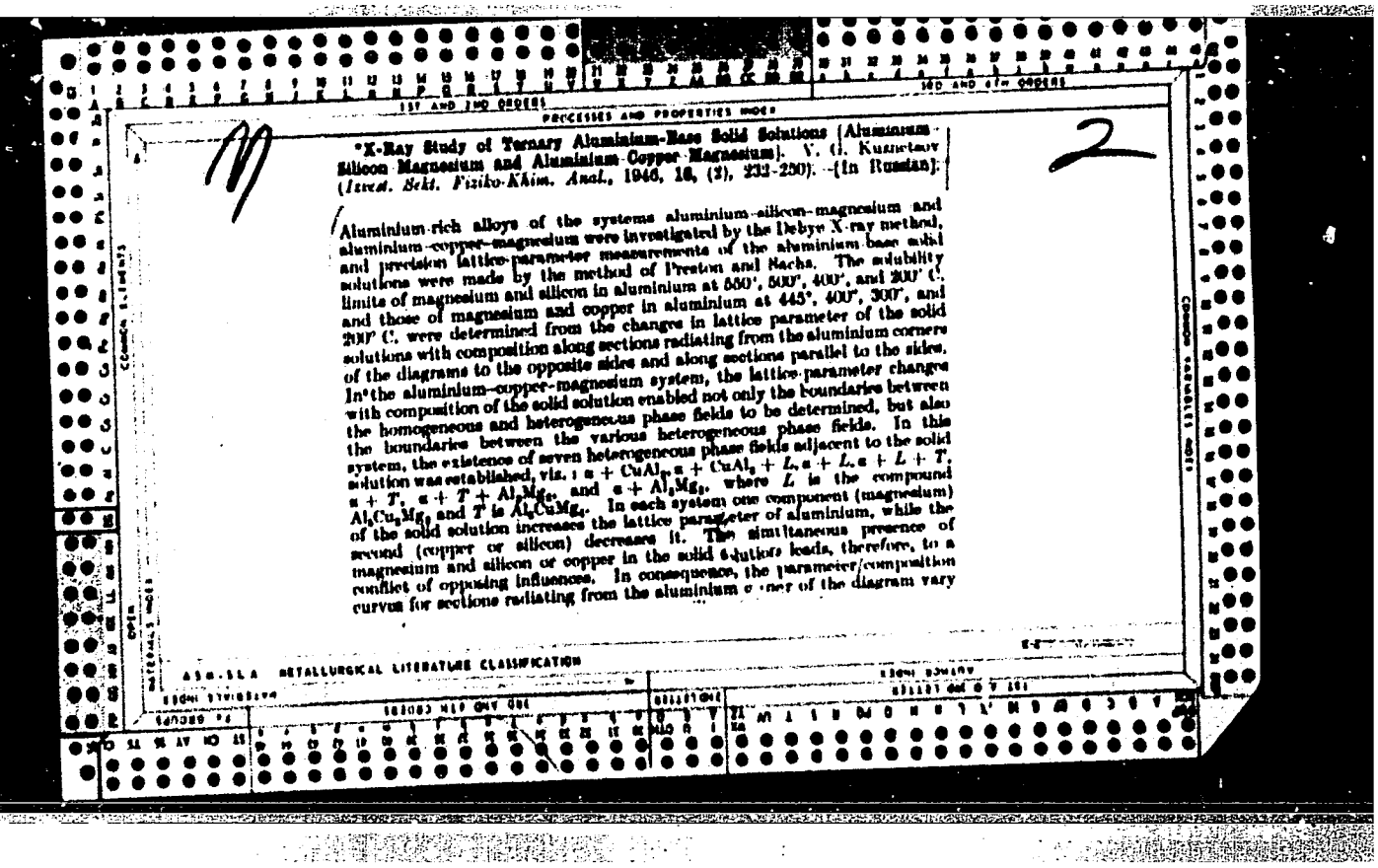
X-RAY STUDY OF THE SOLID SOLUTION OF ALUMINIUM AND SILVER IN MAGNESIUM. V. G. KUZNETSOV (IZVEST. AKAD. NAUK S.S.S.R. 1946 (Khim.) (5) 420-430)-- (In Russian) The relation between composition and the a and c lattice constants of the ternary solution of aluminium and silver in magnesium, was determined. From parameter/ composition curves, isoparameter curves, and studies of the microstructure of heat-treated alloys, K. determined the boundaries of the ternary solid solution and the boundaries of the two-and three-phase fields at 380°, 300°, and 200°C. The isotherm for 405°C. (the [illegible] temp. of the ternary eutectics was obtained by extrapolation. The solubility of silver in magnesium at 300°C., [illegible] does not change with addition of silver; at higher temp. it at first increases, then decreases. The following data regarding saturation limits were obtained from the intersection of two curves; 405°C., aluminium 10.2, silver 6.4, wt.%; 380°C., aluminium 8.8, silver 5.6 wt. %; 300°C., aluminium 5.6, silver 2.2 wt.%; 200°C ., aluminium 3.2, silver 0.8 wt.% The change in lattice parameter with composition varies inversely with the atomic radii of [illegible] magnesium, aluminium.



THE MECHANICAL PROPERTIES O? MAGNESIUM RICH MAGNESIUM ALUMINIUM SILVER ALLOYS . V. O. KUZNETSOV AND MA.ASKRYABIN (IZVEST. AKAD. NAUK S.S.S.R., 1946, (Khim.) (6) 557-566) (In Russian) The Brinell hardness of magnesium-rich alloys whose compositions lay along three rad ial sections 9silver; aluminium -4;1,1;1, andl;4) was measured (a) after quenching from 390°C., (b) after slow cooling, (C)after natural ageing, and (d) after artificial ageing, and isohardness curves were dra wn. Plasti ity increases with increase in the r.tio of silver to aluminium, while the region of brittl alloys moves in the direction of high concentrations of alloying elements. The existence of a minimum on the ha rdness curves of t.e magnesium solid s olution is established, and it is suggested that this corresponds to a sta te of shortrange ordering. nvestigation of the tensile strength and elongation of a

METALLURGICAL LITERATURE CLASSIFICATION

series of cast alloys from the solid-solution range, at 250° and 300° C., showed that the best mechanical properties are obtained with additions of 0·5–1·0% silver to alloys containing 3–5% aluminium. Among those investigated two alloys stand out: (1) that containing silver 0·5, aluminium 4·34, manganese 0·40% has a tensile strength (in kg./mm.²) of 22·8 as quenched, 22·8 as slowly cooled, 13·6 at 250° C., and 10·5 at 300° C., with corresponding elongation values of 17·7, 12·1, 23·4, and 29·5%; and (2) that containing silver 1·04, aluminium 3·09, manganese 0·27% has tensile strengths (in the same order as above) of 22·7, 23·3, 12·3, and 7·8 kg./mm.² and elongation values of 18·3, 20·9, 41·3, and 52·8%.—N. A.



*X-Ray Study of Ternary Aluminium-Base Solid Solutions (Aluminium-Silicon-Magnesium and Aluminium-Copper-Magnesium). V. G. Kuznetsov (*Izvest. Sekt. Fiziko-Khim. Anal.*, 1946, 16, (2), 232-250). (In Russian).

Aluminium-rich alloys of the systems aluminium–silicon–magnesium and aluminium–copper–magnesium were investigated by the Debye X-ray method, and precision lattice-parameter measurements of the aluminium-base solid solutions were made by the method of Preston and Sachs. The solubility limits of magnesium and silicon in aluminium at 550°, 500°, 400°, and 300° C. and those of magnesium and copper in aluminium at 445°, 400°, 300°, and 200° C. were determined from the changes in lattice parameter of the solid solutions with composition along sections radiating from the aluminium corners of the diagrams to the opposite sides and along sections parallel to the sides. In the aluminium–copper–magnesium system, the lattice-parameter changes with composition of the solid solution enabled not only the boundaries between the homogeneous and heterogeneous phase fields to be determined, but also the boundaries between the various heterogeneous phase fields. In this system, the existence of seven heterogeneous phase fields adjacent to the solid solution was established, viz.: $\alpha + CuAl_2$, $\alpha + CuAl_2 + L$, $\alpha + L$, $\alpha + L + T$, $\alpha + T$, $\alpha + T + Al_2Mg_5$, and $\alpha + Al_2Mg_5$, where L is the compound $Al_5Cu_2Mg_8$ and T is Al_4CuMg_4. In each system one component (magnesium) of the solid solution increases the lattice parameter of aluminium, while the second (copper or silicon) decreases it. The simultaneous presence of magnesium and silicon or copper in the solid solution leads, therefore, to a conflict of opposing influences. In consequence, the parameter/composition curves for sections radiating from the aluminium corner of the diagram vary

in direction according to the magnesium : silicon or magnesium : copper ratio in the solid solution. In the two systems studied, one sees clearly the effect of the chemical interaction of the component metals with one another on the change of lattice parameter of the aluminium solid solution with composition and particularly on the shape of the solubility curve. Minima on the solubility isotherms are connected with the formation of the binary compound Mg_2Si in the aluminium–magnesium–silicon system and the ternary compound L ($Al_2Cu_2Mg_8$) in the aluminium–copper–magnesium system. The tendency for the compounds Mg_2Si and L to be formed in the homogenous aluminium-base solid solution also, is evidenced by an anomalous contraction of the lattice. In the solid solution of magnesium and silicon in aluminium there are marked discrepancies between the experimentally determined and the calculated values of the lattice parameters of alloys lying on, or near to, the quasi-binary section aluminium–Mg_2Si. The values determined are distinctly lower than the calculated ones, a fact which points to the existence of Mg_2Si molecules in the solid solution.—N. A.

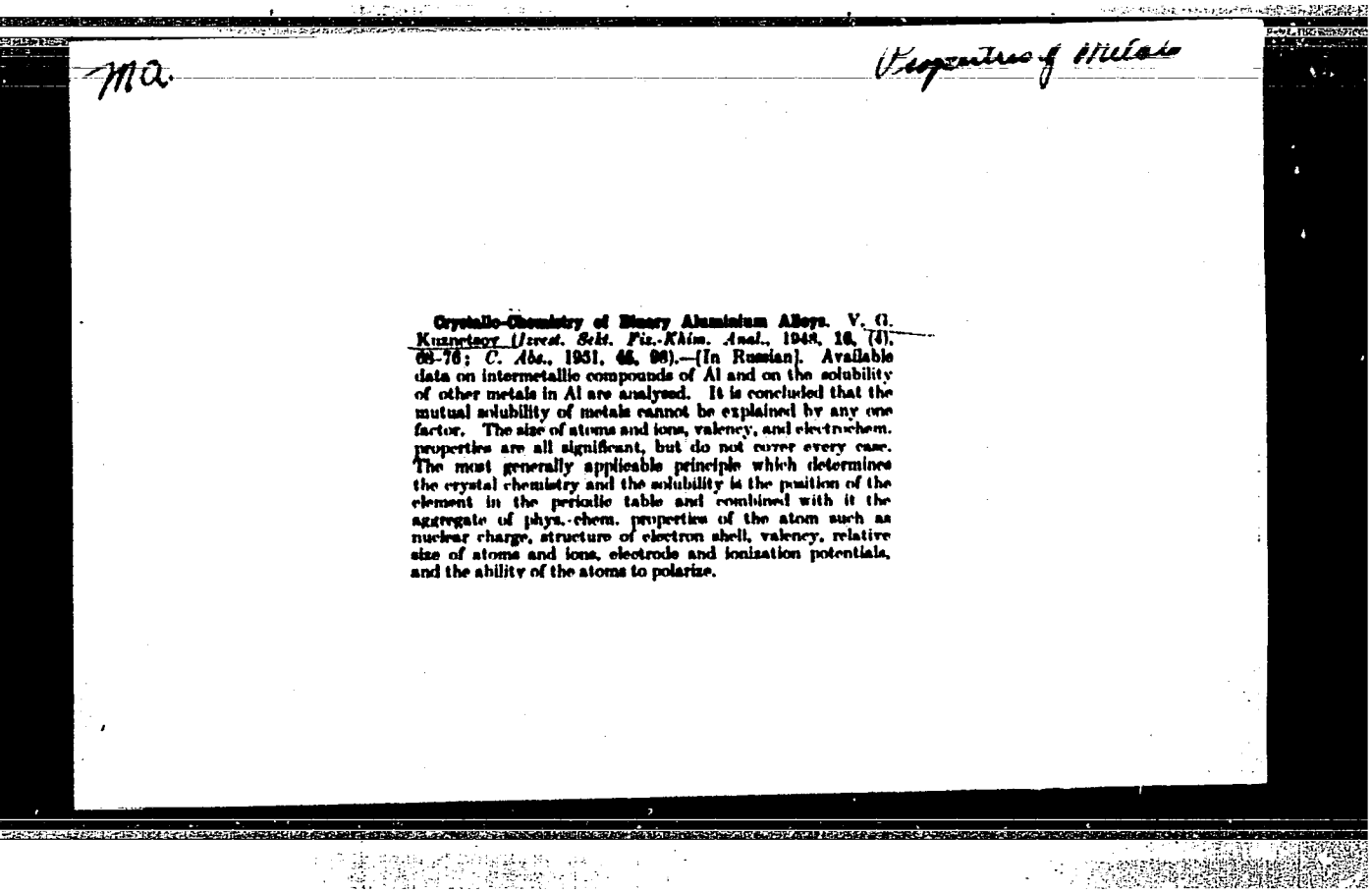
KUZNETSOV, V. G. Dr. Chem. Sci.

Dissertation: "The Structure and Properties of Binary and Ternary Solid Solutions of Substitution." Inst of General and Inorganic Chemistry imeni N. S. Kurnakov, Acad Sci USSR, 23 Apr 47.

SO: Vechernyaya Moskva, Apr, 1947 (Project #17836)

Radiographic investigation of palladium-gold-silver alloys. V. G. Kuznetsov. *Invest. Sektora Platiny i Drug. Blagorod. Metal., Inst. Obshchel i Neorg. Khim., Akad. Nauk S.S.S.R.* (Ann. secteur platine, Inst. chim. gén.) No. 20, 5-20 (1947).—The purpose of this investigation was to prove that Pd-Au-Ag form a continuous series of ternary solid solns. and to study the changes in lattice parameter with changes in compn. The radiograms were made with a Debye camera with 0.2-mm. wire annealed for 30 min. at 800° and the lines on the radiograms were measured by the Straumanis and Ievinš method (*C.A.* 30, 2447⁸, 7410⁹). The results confirmed that this ternary system forms a continuous series of alloys. The dimensions of the lattice with change in compn. of the alloy are discussed in the light of the Vegard principle (*C.A.* 15, 2787).

M. Hoch



Ma.

Properties of Metals

Crystallo-Chemistry of Binary Aluminium Alloys. V. G. Kuznetsov (*Izvest. Sekt. Fiz.-Khim. Anal.*, 1948, 16, (4), 68-76; *C. Abs.*, 1951, 45, 98).—(In Russian). Available data on intermetallic compounds of Al and on the solubility of other metals in Al are analysed. It is concluded that the mutual solubility of metals cannot be explained by any one factor. The size of atoms and ions, valency, and electrochem. properties are all significant, but do not cover every case. The most generally applicable principle which determines the crystal chemistry and the solubility is the position of the element in the periodic table and combined with it the aggregate of phys.-chem. properties of the atom such as nuclear charge, structure of electron shell, valency, relative size of atoms and ions, electrode and ionization potentials, and the ability of the atoms to polarize.

C.A.

X-ray investigation of alloys of the system platinum-copper-nickel. V. G. Kuznetsov. *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* **16**, No. 4, 150–67 (1948).—Studied were ternary alloys with 50, 60, 80, and 90 at. % Pt and Pt-Cu alloys with 24.97, 50.22, 60.31, 73.90 at. % Pt. Ternary alloys heated at 950° or higher formed a continuous series of solid solns. Their structure was a face-centered cubic lattice. In the binary Pt-Cu system at 850° $PtCu_3$ formed having rhombohedral lattice. The same compn. separates out upon slow cooling of the ternary alloy contg. Pt 50, Cu 45, and Ni 5 at. %. Careful measurements of the lattice parameter of the ternary system showed deviations from the Vegard additivity rule, in this case the lattice expanded. It was further observed that the combined action of Cu and Ni in this respect affected more the expansion of the lattice than the same no. of atoms of one of these elements.

M. Hasch

KUZNETSOV, V. G. PA 63/49T9

USSR/Chemistry - Manganese Oxides Jul/Aug 49

"Gamma-Modification of Manganese Dioxide," I. S. Morozov, V. G. Kuznetsov, Inst of Gen and Inorg Chem imeni N. S. Kurnakov, Acad Sci USSR, 11 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 4

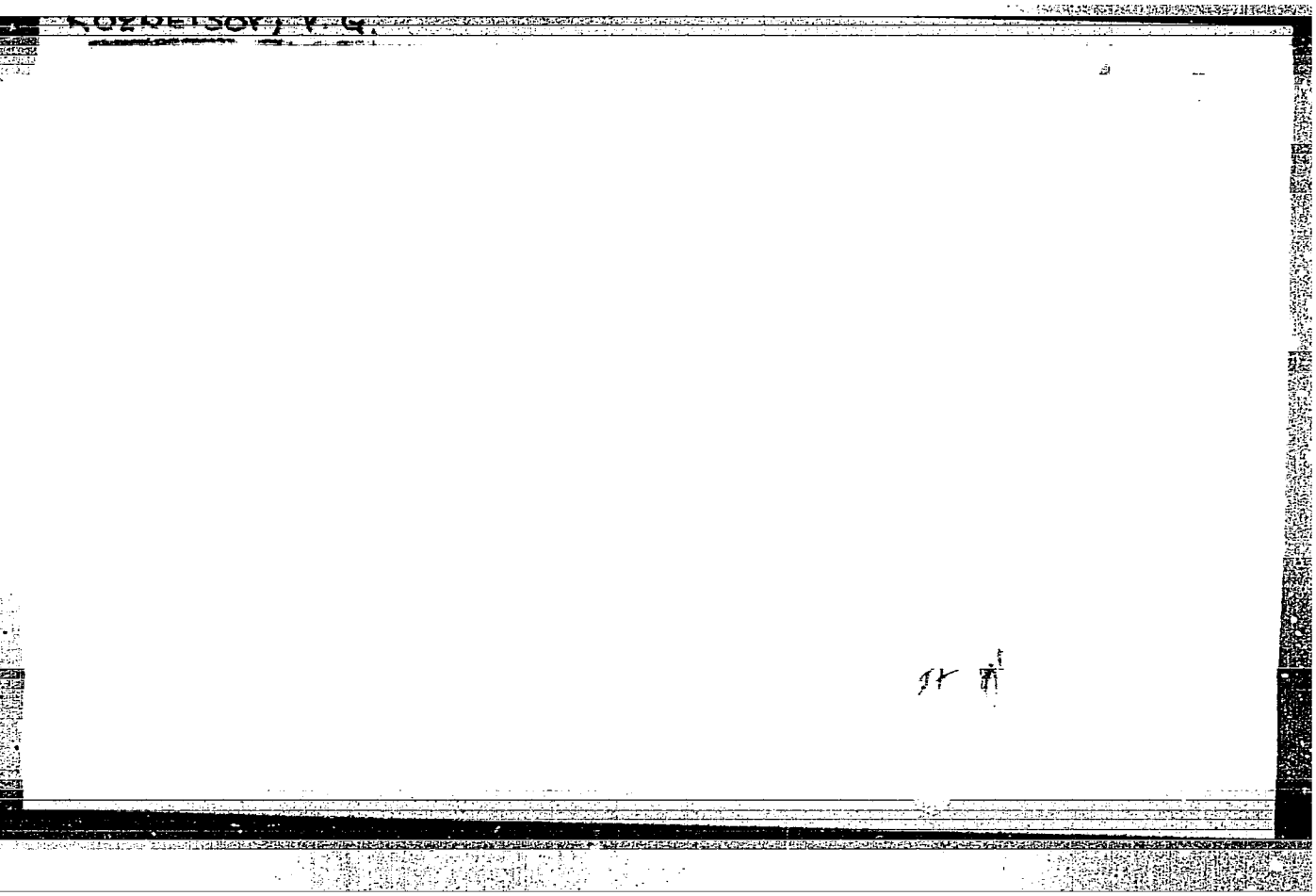
Chlorination of beta-Mn_2O_3 in a water medium with chlorine gas produced the subject modification which was then investigated by X-ray (photographs included) and thermal analysis, and also as to its specific weight. Results showed it to be a polymorphic modification of beta-MnO_2, and that conversion of gamma-MnO_2 into beta-MnO_2

63/49T9

USSR/Chemistry - Manganese Oxides Jul/Aug 49 (Contd)

proceeded irreversibly at 325°, accompanied by a decrease in specific volume and a low-heat liberation. Adsorption of cations by gamma-MnO_2 and beta-MnO_2 powders from electrolyte solutions is the same for equal dispersion of particles. Modification can be used as a depolarizer in galvanic cells. Submitted 17 Jul 48.

63/49T9



The system BiCl, Bi [illegible] G. G. Urazov, [illegible] *Inst. Obshch. Neorg. Khim. Akad. Nauk S.S.S.R.*, [illegible] *Izvest. Sektora Fiz.-Khim. Analiza, Akad. Nauk S.S.S.R.*, 1, 102–11 (1954); cf. Marino and Becarelli, *C.A.* 10, 2561, 2671.—Thermal analysis, x-ray examn., and microscopic methods were applied to the system $BiCl_3$–Bi. Thermal analysis showed the formation of unstable BiCl in alloys with from 58 to 97.0 at. % Bi. X-ray analysis also showed the unstable BiCl that exists for some 18–20 min.; it cannot be detected in slowly cooled alloys. BiCl has a lattice that is of different type than cubic. In this system the layer formation area extends from 58 to 97 at. % Bi. BiCl forms 2 modifications; the first is the common form found in cooled alloys which gives 47 x-ray lines and has the interplanar distances 3.30, 2.82, 3.08, and 2.95 kX. The 2nd form occurs in specimens formed by sucking the melt into a capillary tube; this form has 50 x-ray lines with interplanar distances 3.53, 2.75, 2.49, 1.92, 1.56, and 1.43 kX.

G. M. Kosolapoff

KUZNETSOV, V. G.

Category: USSR / Physical Chemistry - Crystals B-5

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 29636

Author : Kuznetsov V. G.
Inst : Physico-Chemical Institute imeni L. Ya. Karpov
Title : X-Ray Analysis at High and Low Temperatures

Orig Pub: Zh. neorgan. khimii, 1956, 1, No 7, 1548-1558

Abstract: Description of the designs and utilization techniques of high- and low temperature x-ray cameras. High temperature cameras, 57.3 and 85.95 mm in diameter, are built on the pattern of the camera of the Moscow Roentgen Plant. The heating elements of the camera are two small, bell-shaped, resistance furnaces utilizing Nichrome (or Pt- and Pt-Rh) wire. Temperature gradient lengthwise of the specimen is $\pm$ 1° at 500° and $\pm$ 3-5° at 800-1000°. The low temperature camera is based on the design developed by the Physico-Chemical Institute imeni L. Ya. Karpov (RZhKhim, 1955, 5249) for recording by the method of blowing with vapor of liquid N_2 (cooling down to -140°) and drenching

Card : 1/2 -4-

AUTHORS: Kuznetsov, V. G., Koz'min, P. A. SOV/78-3-10-22/35

TITLE: On the Structure of the Phase Composition of $Pb_3Sb_2O_{8.47}$ (O strukture fazy sostava $Pb_3Sb_2O_{8.47}$)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 10, pp 2361-2365 (USSR)

ABSTRACT: The structure of the compound $Pb_3Sb_2O_{8.47}$ was determined and the nature of oxygen was determined. The synthesis of $Pb_3Sb_2O_{8.47}$ was carried out by the interaction of oxides of PbO and Sb_2O_4 at 700°C in air. The formula $Pb_3Sb_2O_8$ was obtained from chemical analysis. This product has a density of 8.95 g/cm^3. This compound has body-centered, cubic lattices. In the system Pb-Sb_2O_4 phases with variable composition are formed in the presence of oxygen. The composition of the phases differs within the limits of 63 mol% PbO and 88 mol% PbO. The compound $Pb_2Sb_2O_7$ was found. Active oxygen is formed in this phase during the oxidation of bivalent to tetravalent tin. The quantity of active oxygen in-

Card 1/2

On the Structure of the Phase Composition of $Pb_3Sb_2O_{8.47}$

creases with the increase of tetravalent tin.
There are 3 figures, 1 table, and 4 references, 2 of which are Soviet.

SUBMITTED: May 19, 1958

Card 2/2

17

PHASE I BOOK EXPLOITATION SOV/5488

Moscow. Vsesoyuznyy nauchno-issledovatel'skiy i konstruktorskiy institut khimicheskogo mashinostroyeniya.

Materialy v khimicheskom mashinostroyenii (Materials in Chemical Machine Building) Moscow, Informatsionno-izdatel'skiy otdel, 1960. 143 p. (Series: Its: Trudy, vyp. 34) 3,000 copies printed.

Sponsoring Agency: Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu and Vsesoyuznyy nauchno-issledovatel'skiy i konstruktorskiy institut khimicheskogo mashinostroyeniya NIIKhIMMASh.

Ed. (Title page): V. K. Fedorov, Candidate of Technical Sciences; Editorial Council: Chairman: V. B. Nikolayev; Deputy Chairman: Yu. K. Vinogradov, Candidate of Technical Sciences; E. M. Borisoglebskiy, A. M. Goncharov, Yu. G. Popandopulo, I. M. Yukalov, Candidate of Technical Sciences, and G. M. Yasova, Candidate of Technical Sciences; Ed.: V. I. Olukhov; Tech. Ed.: P. A. Vakriseev.

PURPOSE: This collection of articles is intended for technical personnel in chemical machine building and other branches of the machine and instrument industry.

COVERAGE: The collection deals with the results of investigations on the mechanical, corrosive, and engineering qualities of certain alloys. Also discussed are heat-treatment regimes, the phase composition of stainless steels, methods of checking products, and new designs of apparatus used in checking. References accompany each article.

TABLE OF CONTENTS:

Card 3/5

9

AVAILABLE: Library of Congress

DRUZHININ, I.G.; KUZNETSOV, N.G.; IMANAKUNOV, B.

Polytherm of a system consisting of nickel sulfate, aluminum sulfate, sodium sulfate, and water at 25-65°, and its solid phases. Izv.AN Kir.SSR,Ser.est.i tekh.nauk 2 no.3:25-49 '60. (MIRA 13:9)

(Nickel sulfate)
(Aluminum sulfate)
(Sodium sulfate)

KHOKHLOVA, N.V., mladshiy nauchnyy sotrudnik; DOMBROVSKAYA, N.S., doktor khim.nauk; KUZNETSOV, V.G., doktor khim.nauk; ZHILINA, Ye.M., inzh.

Chemical investigation of the σ-phase isolated from 1Kh18N9T steel. Trudy NIIKHIMMASH no.34:104-111 '60. (MIRA 14:1)
(Steel—Analysis) (Steel—Metallography)

S/576/61/000/000/020/020
E021/E120

AUTHORS: Kuznetsov, V.G., Yeliseyev, A.A., Shpak, Z.S., Palkina, K.K., Sokolova, M.A., and Dmitriyev, A.V.

TITLE: Study of the phase diagram and the electrical conductivity of the phases of the Ni-S, Ni-Se and Co-S systems

SOURCE: Soveshchaniye po poluprovodnikovym materialam, 4th. Voprosy metallurgii i fiziki poluprovodnikov; poluprovodnikovyye soyedineniya i tverdyye splavy. Trudy soveshchaniya. Moscow, Izd.-vo AN SSSR, 1961. Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova. Fiziko-tekhnicheskiy institut. 159-173.

TEXT: Information on the phase diagram and electrical conductivity of the phases of the systems Ni-S, Ni-Se and Co-S is important for the technology of extraction of nickel, cobalt, selenium and sulphur from their ores and also for the search for new semiconducting materials. The present investigation was therefore carried out. Detailed X-ray analysis, differential thermal analysis and measurements of density were carried out.

Card 1/4

Study of the phase diagram and the ... S/576/61/000/000/020/020
E021/E120

Electrical conductivity in the range 20 to 440 °C was measured, and in general showed a steady fall as the temperature increased. The results showed that in solid solutions based on β-NiSe or β-CoS with a defect nickel arsenide structure and a content of selenium or sulphur greater than 51.6 atomic %, a superlattice is formed. This is explained by ordering of defects in the lattice in Ni or Co positions. The following structures were found to exist: $Ni_4S_{3\pm x}$ - hexagonal with parameters at 650° of a = 5.43 ± 0.01kX, c = 12.02 ± 0.01kX and c/a 2.213; Ni_9S_8 - hexagonal with a = 12.10 ± 0.1kX, c = 11.28 ± 0.01kX, c/a = 0.932 in a lattice of six Ni_9S_8 groups; Ni_6Se_5 - hexagonal with a = 3.77 ± 0.01kX, c = 15.86 ± 0.02kX, c/a = 4.202; $Ni_{21}Se_{20}$ - hexagonal with a = 7.95 ± 0.01kX, c = 9.76 ± 0.01kX, c/a = 1.227; β Ni_3Se_{20} - tetragonal with parameters at 650 °C of a = 7.60 ± 0.01kX, c = 6.22 ± 0.01kX, c/a = 0.818.

It was shown that NiS_2 has semiconducting properties. The phases β NiS, β NiSe and β CoS with a nickel-arsenide structure and β CoS, β NiSe with a nickel-arsenide superlattice, and also

Card 2/ 4