ACCESSION NR: AP4017589

used for designing a separator of 2-3 statistically close signals; however, with a higher number of signals, the number of alternatives rises so rapidly (as 11) that it would be more reasonable to use, e.g., a quasi-optimum method of successive alternative-pair comparisons. Another limitation of the theory is that, in the process of observation, the decision as to the number of signals is not reconsidered and the signals are regarded as finally solved. Orig. art. has: 2 figures and 40 formulas.

ASSOCIATION: none

SUBMITTED: 07May62	DATE ACQ: 18Mar64	ENCL: 00
SUB CODE: CO	NO REF SOV: 004	OTHER: 000

Card 2/2

ACCESSION NR: AP4024721 S/0109/64/009/003/0408/0417

AUTHOR: Bol'shakov, I. A.; Laty*sh, V. G.

TITLE: Isolating an unknown number of fluctuating signals from noise on the basis of the theory of random points

SOURCE: Radiotekhnika i elektronika, v. 9, no. 3, 1964, 408-417

TOPIC TAGS: signal, noise, signal noise separation, signal transmission, communication theory

ABSTRACT: The fundamentals of the theory of random points are briefly set forth. A realization y(t) at the receiver output is regarded as an additive mixture of an indefinite number of signals which depends on one type of parameters λ and noise. The parameter values are considered as random points in the space R. A definite number of points n drops out in R, one point per each of the segments $(\lambda_1, \lambda_1 + d\lambda_1), \ldots, (\lambda_n, \lambda_n + d\lambda_n)$; this event is denoted by $A_n(\lambda_1, \ldots, \lambda_n)$. Therefore, with $d\lambda_i \to 0$, the probability of the above event is $P(A_n) = e_n(\lambda_1, \ldots, \lambda_n)d\lambda_1 \ldots d\lambda_n$; or, using the Bayes formula, the a-posteriori probability is $P(A_n) = CP(A_n)P(y(t)/A_n)$, C is the normalizing constant, $P(A_n)$ is the a-priori probability of the event;

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ACCESSION NR: AP4024721

$P(y(t) / A_n)$ is a likelihood function. A set of the latter functions is determined for a various number n of signals in order to find the conditional probability density. A set of normally fluctuating signals in the white noise is described; independently fluctuating, statistically identical, nonoverlapping and overlapping signals are analyzed. The a-posteriori distribution of like parameters of a set of fluctuating signals can help in solving the problems of optimum detection, measuring, and resolving many signals when their number is not a-priori known. Orig. art. has: 3 figures and 37 formulas.

ASSOCIATION: none

SUBMITTED: 30Jan63	DATE ACQ: 10Apr64	ENCL: 00
SUB CODE: CO	NO REF SOV: 006	OTHER: 000

Card 2/2

ACCESSION NR: AP4038606 S/0109/64/009/004/0563/0570

AUTHOR: Bol'shakov, I. A.; Vatollo, V. V.; Laty*sh, V. G.

TITLE: Methods for detecting and measuring an unknown number of signals based on the random-point theory

SOURCE: Radiotekhnika i elektronika, v. 9, no. 4, 1964, 563-570

TOPIC TAGS: radar, radar signal detection, decision theory, random point theory

ABSTRACT: An attempt is made to unite the decision theory and the theory of correlated random points for solving the problem of signal observation (detection and measurement). An unknown number of (radar) signals are received mixed with noise. The mean-risk function is set up, and the Bayes decision operators, which ensure the highest quality of signal measurement and resolution, are determined. The general structure of a detector-measurer is figured out on the

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ACCESSION NR: AP4038606

basis of the square-law loss function. It is expected that the same method can be extended over the cases of signals depending on several parameters, signals of several known classes, arbitrarily grouped signals, etc. Orig. art. has: 22 formulas.

ASSOCIATION: none

SUBMITTED: 30Jan63	DATE ACQ: 05Jun64	ENCL: 00
SUB CODE: DC	NO REF SOV: 003	OTHER: 001

Card 2/2

L 2017-65

ACCESSION NR: AP5001759 S/0103/64/025/012/1656/1669

AUTHOR: Bol'shakov, I. A.; Repin, V. G.

B

TITLE: Problems of nonlinear filtration. Part 2 - Multivariable case

SOURCE: Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1656-1669

TOPIC TAGS: filtration, nonlinear filtration, multivariable servo

ABSTRACT: In Part 1 of the authors' work (Avt. i Telemekh., v. 22, no. 4, 1961), the problem of optimal measurement (filtration) of one random variable parameter having specified statistics and encoded in desirable components (signal) mixed with a fluctuation noise was considered. In the present article, the results are extended over the case of several random variable parameters, with several input signals. A set is considered of m random signals $y^{(1)}(t)$, $y^{(2)}(t)$, $y^{(m)}(t)$, all or some of which being dependent on l interconnected random time-variable parameters $\lambda^{(1)}(t), \lambda^{(2)}(t), \ldots, \lambda^{(l)}(t)$. At time moments t_1, $t_2 \ldots t_n$ the signals and parameters will be:

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ACCESSION NR: AP5001759

$$\{y_1^{(1)}, \ldots, y_1^{(m)}; y_2^{(1)}, \ldots, y_2^{(m)}; \ldots, y_n^{(1)}, \ldots, y_n^{(m)}\} = y,$$

$$\{\lambda_1^{(1)}, \ldots, \lambda_1^{(l)}; \lambda_2^{(1)}, \ldots, \lambda_2^{(l)}; \lambda_n^{(1)}, \ldots, \lambda_n^{(l)}\} = \lambda,$$

where $y = (y_1, \ldots, y_n)$ and $\lambda = (\lambda_1, \ldots, \lambda_n)$ are compound column-vectors with subcolumn-elements $y_i = (y_i^{(1)}, \ldots, y_i^{(m)})$ and $\lambda_i = (\lambda_i^{(1)}, \ldots, \lambda_i^{(l)})$. Based on these premises, integral equations are set up and approximately solved for a few particular cases of optimal filtration. The structure of a multivariable measuring-filtering circuit is synthesized for a Gaussian a-priori distribution of $P_0(\lambda)$; two-loop and single-loop block diagrams are presented. Characteristics of a multivariable discriminator and smoothing circuits are studied. Practical application is illustrated by an example of measuring the time delays of two fluctuating harmonic-FM signals. Orig. art. has: 6 figures and 50 formulas.

ASSOCIATION: none

SUBMITTED: 27Nov63

SUB CODE: EC NO REF SOV: 008 ENCL: 00 OTHER: 002

Card 2/2

L 60396-65

ACCESSION NR: AP5016973 UR/0280/65/000/003/0107/0113

AUTHOR: Bol'shakov, I. A. (Moscow)

TITLE: Determination of the intragroup structure of one or several groups with a random number of signals

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 3, 1965, 107-113

TOPIC TAGS: random signal structure, random signal group, characteristic operator, random point law, intragroup structure

ABSTRACT: In an earlier paper, the author solved the problem of determining the coordinates λ_i of a random number of one-type signals (Izv. AN SSSR. Otd. tekhn. n., Tekhnicheskaya kibernetika, 1964, no. 3). The totality of signals constitutes one or several groups characterized by the total-group parameters μ_i and they are received in a single mixture with noise. The coordinates λ_i (and in the case of numerous groups the μ_i's) obey the random point laws (R. L. Stratonovich, Izv. AN SSSR, Otd. tekhn. n., Energetika i avtomatika, 1961, no. 2). The present paper gives the optimum operators for the formation of a posteriori characteristics and an explanation of their operation. These results, together with those from the preceding paper, constitute the basis for the determination of the total group and intragroup parameters. A reasonably detailed

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L 60396-65

ACCESSION NR: AP5016973

selection process of engineering circuit alternatives cannot be separated from the quality estimates indicating the deviation of these alternatives from the potentially possible limit corresponding to the above-mentioned operators. Orig. art. has: 31 formulas and 2 figures.

ASSOCIATION: None

SUBMITTED: 11Jul64 ENCL: 00 SUB CODE: DP, IE

NO REF SOV: 008 OTHER: 000

dm

Card 2/2

L 65264-65 EWT(d)/EED-2

ACCESSION NR: AP5021849 UR/0280/65/000/004/0031/0040

AUTHOR: Bol'shakov, I. A. (Moscow)

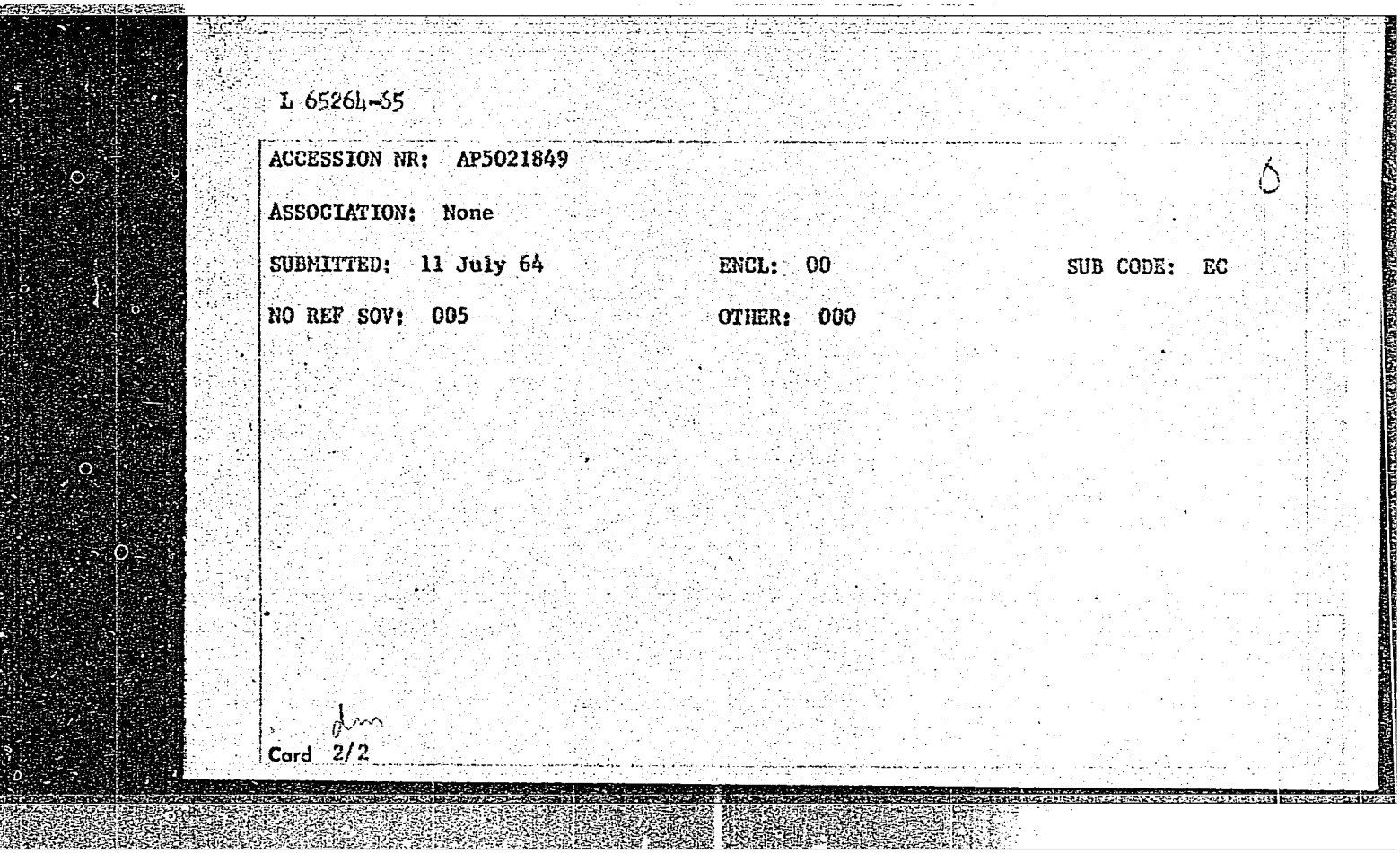
TITLE: The detection and measurement of parameters of a random number of signals belonging to different classes

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 4, 1965, 31-40

TOPIC TAGS: random noise signal, white noise, signal noise separation

ABSTRACT: Earlier papers by the author dealt with the problem of extraction from the noise, of a random number of statistically equivalent signals. However, during applications it can be rarely assumed that all the signals belong to the same class. Consequently, using the correlated random points theory, the author establishes the a posteriori probability of the values of the parameters of a random number of signals belonging to different classes and appearing undistinguishable within these classes. On the basis of the solution theory the author formulates the optimum operator of the simultaneous detection and measurement of the parameters of signals belonging to several classes and the signals of a single class over the background of the others. The results are illustrated by examples of regular and fluctuating signals in a white noise. Orig. art. has: 42 formulas and 2 figures.

Card 1/2



L 65264-65

ACCESSION NR: AP5021849

ASSOCIATION: None

SUBMITTED: 11 July 64 ENCL: 00 SUB CODE: EC

NO REF SOV: 005 OTHER: 000

Card 2/2

L 31291-65 EWT(d)/EEO-2/EEC-4/EED-2
ACCESSION NR: AP5005338 S/0109/65/010/002/0211/0219

AUTHOR: Bol'shakov, I. A. 16 B

TITLE: Isolation from noise of an unknown number of signals having Markov-type parameters 8

SOURCE: Radiotekhnika i elektronika, v. 10, no. 2, 1965, 211-219

TOPIC TAGS: signal isolation, Markov process, signal noise separation

ABSTRACT: Methods of forming a-posteriori characteristics and simultaneously detecting-measuring a chance number of indistinguishable signals having Markov-variable coordinates are considered. The operators are taken from a physically realizable class, i.e., the forming of a-posteriori data and the process of detection-measurement are conducted for the last moment of observations, on the basis of all realization y(t) available by that moment. At every fixed moment, the parameters make up a set of random points whose motion obeys Markov's

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L 31291-65
ACCESSION NR: AP5005338

laws. As a particular case of the Markov process, a diffusion motion of signals is considered which is characterized by the drift and diffusion coefficients; this motion can describe maneuvering targets. The results permit a more rigorous synthesis of moving-target detectors than hitherto provided by N. Waks' methods. A quasi-determinate signal motion (when its laws are known, no random disturbance is involved but initial conditions are random) is also considered. It is noted that, in detecting randomly moving targets, the accumulation time, as compared to that of the conventional multichannel detector, will be longer by τ_{corr}/τ_0 times, where τ_{corr} is the signal-parameter correlation interval and τ_0 is the time of the signal stay within one resolution interval. Orig. art. has: 1 figure and 34 formulas.

ASSOCIATION: none

SUBMITTED: 09Jan64 ENCL: 00 SUB CODE: EC, MA

NO REF SOV: 008 OTHER: 001

Card 2/2

BOL'SHAKOV, I.A. (Moskva)

Detection and measurement of the parameters of a random number of signals belonging to different classes. Izv. AN SSSR. Tekh. kib. no.4:31-40 Jl-Ag '65. (MIRA 18:11)

ACC NR: AR6035189 SOURCE CODE: UR/0274/66/000/009/A005/A005

AUTHOR: Bol'shakov, I. A.; Minin, Yu. N.

TITLE: Spatial methods of separating signals from static in a multichannel wide-scanning-field system

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz', Abs. 9A27

REF SOURCE: Sb. 2-ya Vses. konferentsiya po teorii kodir. i yeye prilozh. Sekts. 5. Ch. I. M., b. g., 46-57

TOPIC TAGS: signal interference, signal correlation, reflected signal, signal noise separation, signal detection

ABSTRACT: A synthesis of the best operators for detecting and measuring signal parameters on a background of spatially concentrated noise interference by the methods of the theory of statistical solution is made. The comparative analysis is carried out for optimum and some nonoptimum processing systems. For the solution of the problem, the amplitude and phase characteristics of individual receiving systems are assumed to be known. In addition, it is assumed that the

Card 1/2 UDC: 621.391.161:621.396.96

ACC NR: AR6035189

observation time of the effective signal is much less than its interval of correlation, which corresponds to the case of slow fluctuations of the reflected signal on a radar in comparison with the period of observation. Spatial methods of separating signals from interference in a multichannel detection system offers a substantial advantage in comparison with methods which do not provide for the compensation of interferences. For the measuring stage, the angular sector of significant increase in the noise errors of measurement can be noticeable decreased. The bibliography consists of 3 titles. Yu. Belousov. [Translation of abstract]

[NT]

SUB CODE: 17/

Card 2/2

ACC NR: AP7002245 (A) SOURCE CODE: UR/0280/66/000/006/0134/0144

AUTHOR: Bol'shakov, I. A.

ORG: none

TITLE: Some multidimensional filter discrimination problems for processes with stationary derivatives

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 6, 1966, 134-144

TOPIC TAGS: filtration, white noise, stationary derivative process

ABSTRACT: Multidimensional (matrix) filters are found for the optimal discrimination of the totality of processes with stationary derivatives from their mixtures with white noises. The distinquishable processes are k-integrals from white noise (k = 1, 2, 3), and they are interrelated. In the general case, white noises are also correlated. Changes in filter structure in proportion to the increase in the order of k processes are revealed, and the resulting reproduction accuracy and gains realized by the joint processing of input mixtures are investigated. [Author's abstract] [DW]

SUB CODE: 09, 12/SUBM DATE: 20Dec65/ORIG REF: 004/OTH REF: 007/

Card 1/1

BOLSHAKOV, I.F.

Apparatus for Determining the Shrinkage and Growth of Metals. I. F. Bolshakov and T. M. Simonov. (*Liteinoe Proizvodstvo*, 1961, (3): 16-17). [In Russian]. Two types of apparatus for determining shrinkage and growth of metals are described. In the first, the metal is cast in a special mould forming part of the apparatus, and the variations in the distance between two points on it are followed with the aid of a micrometer device. Examples of results with grey iron, cylinder iron and malleable cast iron, cast at 1290 and 1380° C. are given. In the second, a needle connected to a micrometer and mounted on a stand is embedded in the casting on which the stand is placed. Both types have given satisfactory service.—S. K.

RYAZANOV, A.A.; BOL'SHAKOV, I.F.

Temperatures of flushing fluids when boring frozen ground. Izv.vys. ucheb.zav.; geol.i razv. 4 no.2:133-141 F '61. (MIRA 14:6)

1. Irkutskiy politekhnicheskiy institut.
(Frozen ground) (Boring)

BOL'SHAKOV, I.F.; RYAZANOV, A.A.

Purpose, design, and operation of an IPI moisture trap. Izv.vys. ucheb.zav.;geol.i razv. 4 no.10:116-120 O '61. (MIRA 14:12)

1. Irkutskiy politekhnicheskiy institut.
(Boring machinery)
(Air-drying)

KRIVOSHEYEV, V.M., inzh.; BOL'SHAKOV, I.F., inzh.

Automatic line for making sand molds. Mashinostroenie no.5:
21-23 S-O '64 (MIRA 18:2)

BOL'SHAKOV, I.F.

Diamond drilling of hard fractured rocks and reasons for the anomalous wear of diamond bits. Izv. vys. ucheb. zav.; geol. i razv. 7 no.7:111-118 Jl '64 (MIRA 18:2)

1. Moskovskiy geologorazvedochnyy institut im. S. Ordzhonikidze.

BOL'SHAKOV, I.F., aspirant

Concerning the stability of the hole walls in underground diamond drilling. Izv. vys. ucheb. zav.; geol i razv. 7 no.10:141-150 O '64. (MIRA 18:7)

1. Moskovskiy geologorazvedochnyy institut im. S.Ordzhonikidze.

BOL'SHAKOV, I. G.

127-58-5-16/30

AUTHORS: Prokopovich, A.A., and Bol'shakov, I.G., Engineers

TITLE: Concentration of Ferruginous Quartzites in the Olenegorsk Plant (Obogashcheniye zhelezistykh kvartsitov na Olenegorskoy fabrike)

PERIODICAL: Gornyy Zhurnal, 1958, Nr 5, pp 53-55 (USSR)

ABSTRACT: The Olenegorskaya obogatitel'naya fabrika (Olenegorsk Concentration Plant) was constructed according to a design by the Institute "Mekhanobr", and was put into operation in 1955. Its annual rated capacity is 6.6 million tons of ore or 2.8 million tons of concentrate, of which the first section of the plant should produce 1.6 million tons. The base of raw material for this plant is the Olenegorsk deposit of ferruginous quartzites with an average iron content of 30.4%. The plant has 3 departments: crushing, concentration and dehydration. The crushing department consists of the buildings for coarse and fine crushing and 10,000-ton-capacity hoppers for crushed ore. The concentration department consists of a main building connected by an underground gallery to a concentration building.

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127-58-5-16/30

Concentration of Ferruginous Quartzites in the Olenegorsk Plant

The dehydration department consists of a building for drying, a 60,000-ton dehydration store-room and a 50,000-ton dry concentrate store-room. In operation, some defects of the technological procedure were disclosed which have been or will be eliminated in the future. The third crushing line with a yearly capacity of 6.6 million tons of ore is to be constructed from 1958 to 1960. Expansion of the concentration building has begun, aiming at a yearly 2.8 million tons of concentrate by 1960. The expansion of the drying building has been completed and 5 additional drying drums have been installed.
There is 1 diagram, 1 table, and 4 Soviet references.

ASSOCIATION: Olenegorskoye rudoupravleniye (Olenegorsk Mine Administration)

AVAILABLE: Library of Congress

Card 2/2 1. Mines-Development 2. Mines-Operation 3. Mines-Production

BOL'SHAKOV, I.G.; SHLENSKAYA, V.A., red. izd-va; KOZLOVA, L.Ye., tekhn. red.

[Before the whole world] Pered litsom vsego mira. Moskva, Vneshtorgizdat, 1960. 128 p. (MIRA 14:9)
(Exhibitions)

BOL'SHAKOV, Ivan Grigor'yevich; BACHININ, G.I., red.; YERKHOVA, Ye.A., tekhn. red.

[On all continents of the world] Na vsekh kontinentakh mira. Moskva, Izd-vo IMO, 1963. 148 p. (MIRA 16:7)
(Exhibitions)

BOL'SHAKOV, I.I., red.; POTREBICH, M., tekhn.red.

[Economy of the Maritime Territory; a statistical manual] Narodnoe khoziaistvo Primorskogo kraia; statisticheskii sbornik. Vladivostok, Primorskoe knizhnoe izd-vo, 1958. 189 p.
(MIRA 12:2)

1. Primorskiy kray. Statisticheskoye upravleniye.2. Nachal'nik Statisticheskogo upravleniya Primorskogo kraya (for Bol'shakov).
(Maritime Province--Statistics)

BOL'SHAKOV, I. I.

Formation of the working class in Moldavia and its cultural and technical growth between 1945 and 1955. Uch. zap. Tir. gos. ped. inst. no.9:3-23 '60. (MIRA 16:1)

(Moldavia—Economic conditions)

BOL'SHAKOV, Ivan Ivanovich; ZEL'TSMAN, L.N., red.

[Today and tomorrow of the Maritime Territory] Segodnia i zavtra Primor'ia. Vladivostok, Primorskoe knizhnoe izdvo, 1962. 70 p. (MIRA 17:11)

BOL'SHAKOV, I.O.

Better organization of roadbed maintenance. Put' i put.khoz. 4 no.6:18 Je '60. (MIRA 13:7)

1. Nachal'nik distantsii puti, stantsiya Gryazovets, Severnoy dorogi.

(Railroads--Maintenance and repair)

BOL'SHAKOV, I.O.

Using consolidated brigades in railroad sections. Put' i put.khoz. 5 no.6:13-14 Je '61. (MIRA 14:8)

1. Nachal'nik Gryazovetskoy distantsii puti Severnoy dorogi.
(Railroads--Management)

AUTHOR: Bol'shakov, I.P., Engineer SOV/133-59-5-28/31

TITLE: Thermal Insulation of Hearth Tubes in Continuous Heating Furnaces (Teplovaya izolyatsiya podovykh trub metodicheskikh pechey)

PERIODICAL: Stal', 1959, Nr 5, pp 465 - 467 (USSR)

ABSTRACT: A study of methods of insulating hearth tubes in continuous heating furnaces in order to decrease heat losses with cooling water carried out by VNIIMT is outlined. Two methods of insulating: with prefabricated refractory blocks (Figure 1) and refractory segments (Figure 2) were tested. It was found that for the majority of gas-fired heating furnaces (with a temperature under the metal not exceeding 1 375 °C) prefabricated chamotte blocks are quite suitable. Their service life exceeds 9 months. At temperature up to 1 250 °C the service life of chamotte blocks in gas- and oil-fired furnaces exceeds one year. For high-temperature oil-fired furnaces (with a temperature under the metal up to 1 475 °C) magnesite and magnesite-chromite blocks give a good service life. At the end of the furnace campaign, only flaking of the insulating blocks

Card1/2

Thermal Insulation of Hearth Tubes in Continuous Heating Furnaces

was observed. The insulation of the hearth tube with prefabricated blocks can be done in 5-8 hours. A centralised production of the insulating blocks, the consumption of which amounts to about 2-3 tons per furnace, is recommended. There are 3 figures.

ASSOCIATION: VNIIMT

Card 2/2

D'YACHKOV, P.N.; PURGIN, A.K.; BOL'SHAKOV, I.P.; GUBKO, I.T.; KOSTOMAROV, N.I.; SIZOV, I.D.

Refractory Dinas material. Ogneupory 26 no.9:394-398 '61. (MIRA 14:9)

1. Vostochnyy institut ogneuporov (for D'yachkov, Purgin, Bol'shakov). 2. Pervouralskiy dinasovyy zavod (for Gubko, Kostomarov, Sizov).

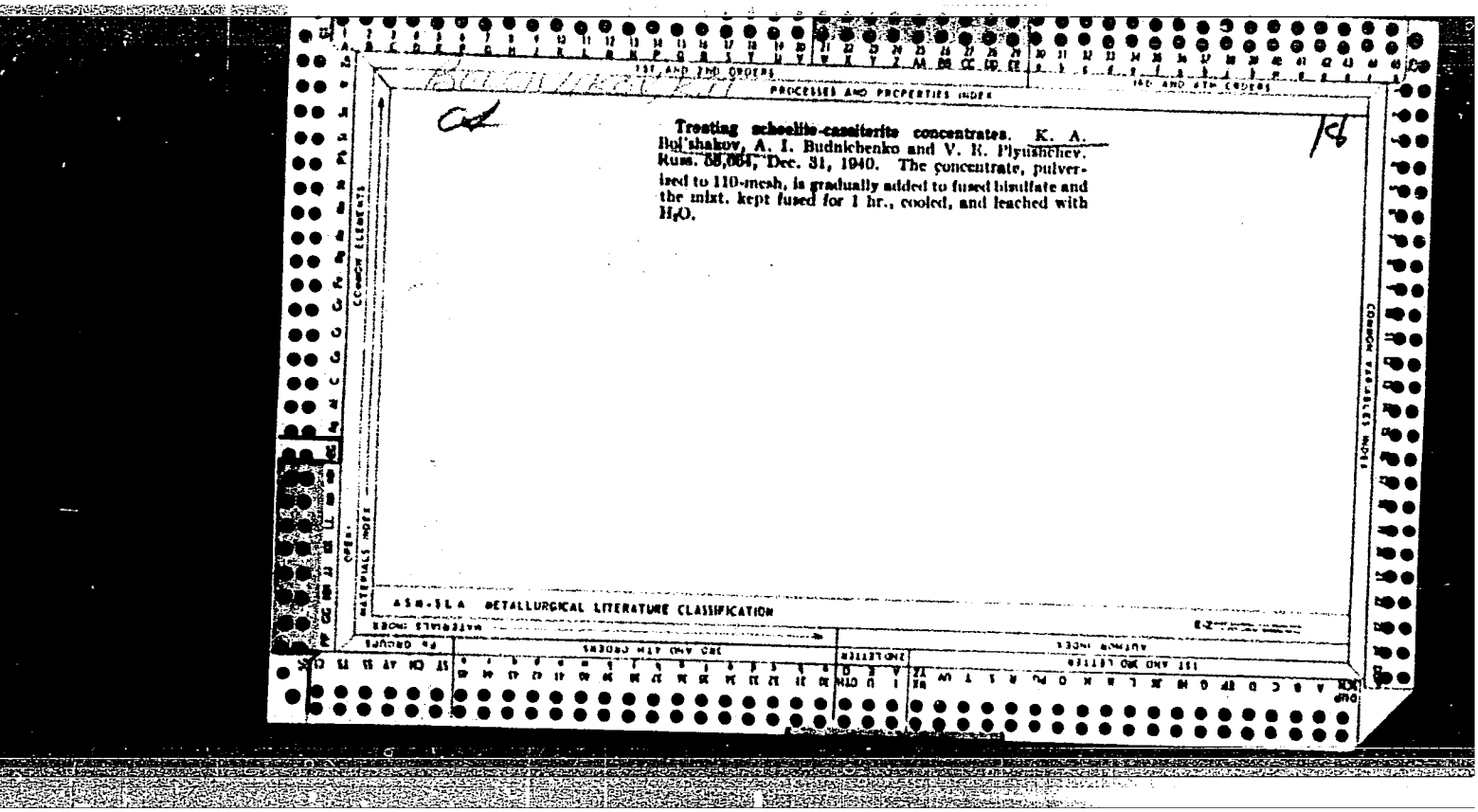
(Refractory concrete)

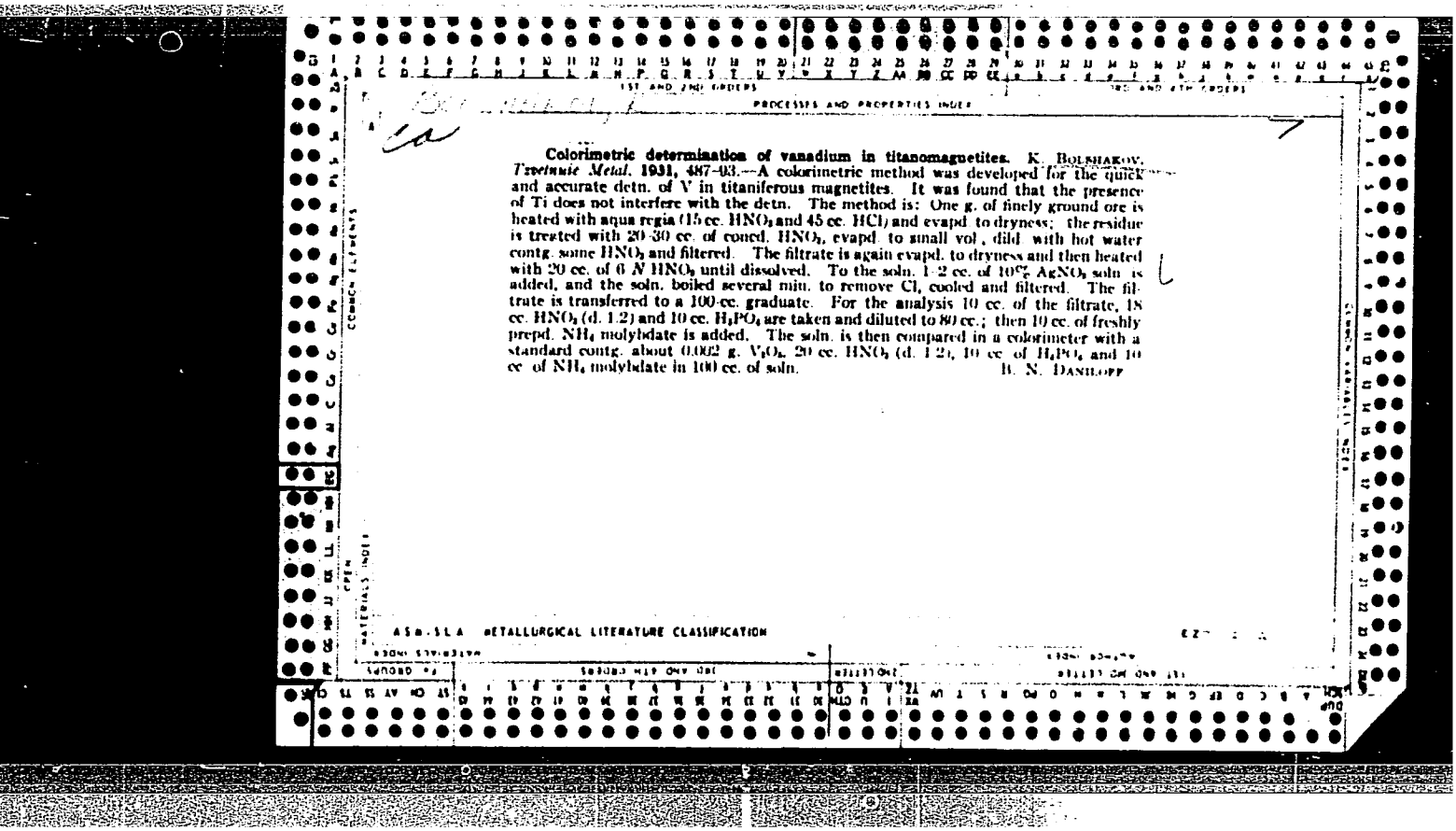
SHALAYEV, V.V.; BURKSER, V.Ye.; BORODIN, P.P.; D'YACHKOV, P.N.; PURGIN, A.K.; BOL'SHAKOV, I.P.

Testing dinas concrete blocks in blooming mill soaking pits. Ogneupory 27 no.6:264-269 '62. (MIRA 15:5)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Shalayev, Burkser, Borodin). 2. Vostochnyy institut ogneuporov (for D'yachkov, Purgin, Bol'shakov).

(Firebrick) (Refractory concrete) (Furnaces, Heating)





PROCESSES AND PROPERTIES INDEX

Colorimetric determination of vanadium in titanomagnetites. K. Bolshakov. *Tzvetnuie Metal.* **1931,** 487–93.—A colorimetric method was developed for the quick and accurate detn. of V in titaniferous magnetites. It was found that the presence of Ti does not interfere with the detn. The method is: One g. of finely ground ore is heated with aqua regia (15 cc. HNO_3 and 45 cc. HCl) and evapd to dryness; the residue is treated with 20–30 cc. of concd. HNO_3, evapd. to small vol., dild. with hot water contg. some HNO_3 and filtered. The filtrate is again evapd. to dryness and then heated with 20 cc. of 6 *N* HNO_3 until dissolved. To the soln. 1–2 cc. of 10% $AgNO_3$ soln. is added, and the soln. boiled several min. to remove Cl, cooled and filtered. The filtrate is transferred to a 100-cc. graduate. For the analysis 10 cc. of the filtrate, 18 cc. HNO_3 (d. 1.2) and 10 cc. H_3PO_4 are taken and diluted to 80 cc.; then 10 cc. of freshly prepd. NH_4 molybdate is added. The soln. is then compared in a colorimeter with a standard contg. about 0.002 g. V_2O_5, 20 cc. HNO_3 (d. 1.2), 10 cc. of H_3PO_4 and 10 cc. of NH_4 molybdate in 100 cc. of soln.

B. N. Danilov

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BOLSHAKOV, K. A.,

5

I. Ya. Bashilov K. A. Bol'shakov, O. E. Zvyagintsev, and N. P. Sazhin. [illegible] 27, [illegible] Obituary with portrait of I. Ya. Bashilov (189? 1953), a specialist in metallurgy of rare metals. G. M. K.

(2)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206130003-6"

BOL SHAKOV

PHASE I BOOK EXPLOITATION 820

Meyerson, Grigoriy Abramovich, and Zelikman, Abram Naumovich

Metallurgiya redkikh metallov (Metallurgy of Rare Metals) Moscow, Metallurgizdat, 1955. 608 p. 5,500 copies printed.

Reviewers: Bol'shakov, K. A., Doctor, Professor, Abrikosov, N. Kh., Doctor of Chemical Sciences, Maslyanitskiy, I. N., Doctor, Professor, Greyver, N. S., Doctor, Professor; Ed.: Vysotskaya, V. N.; Ed. of Publishing House: Kamayeva, O. M.; Tech. Ed.: Attopovich, M. K.

PURPOSE: This book is recommended as a textbook for students at metallurgical institutes and may also be useful to engineers and technicians.

COVERAGE: The book deals with the industrial production of refractory metals (tungsten, molybdenum, tantalum, niobium, vanadium, titanium, and zirconium) and the trace-associate metals (gallium, indium, thallium, germanium, selenium, tellurium, and rhenium). Physical and chemical properties are given, and fields of application are specified. The authors explain the theoretical and practical aspects of the production of pure metals and their more important alloys and chemical compounds. Chapters IV, VII, XIII-XVI, and Section 60

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were written by G.A. Meyerson,; Chapters I-III, V, VI, VIII-XII, XVII-XXII, by A.N. Zelikman. The authors express their thanks for suggestions received from the reviewers and from scientific workers in the Department of Metallurgy of Light Metals of the Moskovskiy institut tsvetnykh metallov i zolota (Moscow Institute of Nonferrous Metals and Gold), at the Gosudarstvennyy nauchno-issledovatel'skiy institut po redkim metallam (State Scientific Research Institute for Rare Metals), and at the Vsesoyuznyy nauchno-issledovatel'skiy institut po tverdym splavam (All-Union Scientific Research Institute for Hard Alloys). There are 375 references, of which 205 are Soviet, 126 English, 40 German, 3 French, and 1 Italian.

TABLE OF CONTENTS:

KOROVIN, S.S.; IVANOVA, R.V.; SAAKOVA, O.V.; BOL'SHAKOV, K.A.

Extraction of gallium from the sulfuric acid solutions by butyl acetate. Zhur. prikl. khim. 34 no.5:1007-1012 My '61. (MIRA 16:8)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. Lomonosova.

(Gallium) (Sulfuric acid) (Acetic acid)

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physicochemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 370

Author: Bol'shakov, K. A., and Fedorov, P. I.

Institution: None

Title: Investigation of the Sodium Sulfate-Cobalt Sulfate and Sodium Sulfate-Nickel Sulfate Systems

Original Periodical: Zh. obshch. khimii, 1956, Vol 26, No 2, 348-350

Abstract: The systems Na_2SO_4(I)-$CoSO_4$(II) and I-$NiSO_4$(III) have been investigated by thermic analysis. Mutual solubility of the components in the liquid state is observed in both systems together with the formation of an extensive region of solid solutions, based on sodium sulfate and the presence of 3 binary compounds: $3Na_2SO_4 \cdot MSO_4$, $Na_2SO_4 \cdot MSO_4$, and $Na_2SO_4 \cdot 3MSO_4$ (M = Ni, Co). Phase diagrams are presented for the systems investigated together with a characterization of the compounds covered, based on crystallographic data. In the system I-II

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USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physicochemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 370

Abstract: the eutectic crystallizes at 565° and 49% II. In the system I-III 2 eutectics were found: at 41 (671°) and 55 (700°) percent III. The data obtained were confirmed by microstructure and crystallographic studies on the alloys.

(M.V. Lomonosov Inst. Fine chem. Technol., Moscow.)

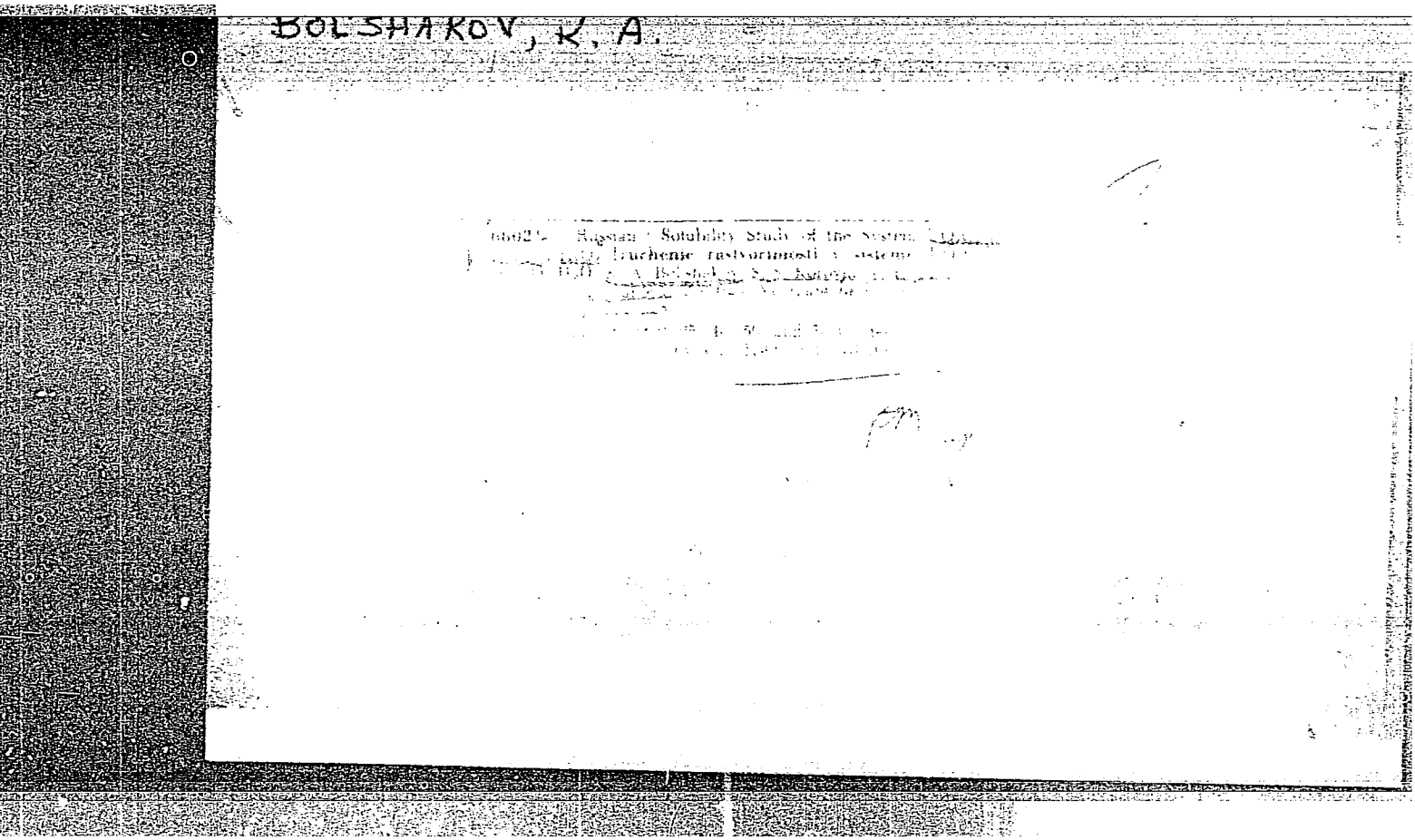
Card 2/2

КИСЛЯКОВ, К.П.

KISLYAKOV, Igor' Pavlovich; BOL'SHAKOV, K.A., prof., dokt., retsenzent; TSEFT, A.L., prof., dokt., retsenzent; SKOBEYEV, I.K., prof., dokt., retsenzent; NADOL'SKIY, A.P., kand.tekhn.nauk, retsenzent; SERIKOV, A.P., kand.tekhn.nauk, retsenzent; BELYAYEVSKAYA, L.V., red.; KAMAYEVA, O.M., red.izdatel'stva; ATTOPOVICH, M.K., tekhn.red.

[Metallurgy of rar metals] Metallurgiia redkikh metallov. Moskva, Gos.nauchno-tekhn. zd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 232 p. (MIRA 11:1)

1. Kafedra metallurgii tsvetnykh metallov Irkutskogo gorno-metallurgicheskogo instituta (for Tseft, Skobeyev, Nadol'skiy, Serikov). 2. Chlen-korrespondent AN Kazakhskoy SSR (for Tseft).
(Metals, Rare and minor--Metallurgy)



Bolshakov, K. A.

Fusion diagrams for the binary systems sodium chloride-cobalt(?) chloride and sodium chloride-nickel chloride. K. A. Bol'shakov, P. I. Fedorov, and G. D. Ayzikina (M.V. Lomonosov Inst. Fine Chem. Technol., Moscow). *Zhur. Neorg. Khim.* 2, 1115–18(1957).—The fusion diagrams for the systems NaCl-$CoCl_2$ and NaCl-$NiCl_2$ were studied by the methods of thermal and microstructural analysis. Both systems are of the eutectic type. For the first system the eutectic point is at 370° (56% $CoCl_2$) and for the second it is at 681° (51% $NiCl_2$). Below the eutectic point in the first system the compd. $2NaCl.CoCl_2$ is formed. No compd. formation was observed in the $NiCl_2$ system.

J. R. Van Wazer

BOLSHAIKOV, K.A.

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Solubility in the quaternary reciprocal system $UO_2(NO_3)_2 + H_2C_2O_4 \rightleftarrows UO_2C_2O_4 + H_2(NO_3)_2$ at 25°. K. A. Bol'shakov and S. S. Korovin (M. V. Lomonosov Inst. Fine Chem. Technol., Moscow). *Zhur. Neorg. Khim.* 2, 1940–50(1957).—The isothermal study of the system $H_2C_2O_4$-HNO_3-H_2O at 25° showed that an increase in the concn. of HNO_3 decreased the soly. of $H_2C_2O_4$. For a HNO_3 concn. above 67.5% by wt., the $H_2C_2O_4 \cdot 2H_2O$ is dehydrated. The compn. of the soln. at the transition point P was 67.48% by wt. HNO_3 and 6.95% $H_2C_2O_4$. The study of the system $UO_2(NO_3)_2$-$UO_2C_2O_4$-H_2O at 25° showed that an increase in the concn. of $UO_2(NO_3)_2$ decreases the soly. of $UO_2C_2O_4$. The compn. of the soln. at the eutonic point was $UO_2(NO_3)_2$ 55.50% and $UO_2C_2O_4$ 0.31%. The following solid phases exist: $UO_2C_2O_4 \cdot 3H_2O$ and $UO_2(NO_3)_2 \cdot 6H_2O$. The quaternary system $UO_2(NO_3)_2 + H_2C_2O_4 \rightleftarrows UO_2C_2O_4 + H_2(NO_3)_2$ was studied for HNO_3 concns. up to 70% and at 25°. This reaction was found to favor the formation of $UO_2C_2O_4$ even at high HNO_3 concn. The following solid phases were observed: $UO_2(NO_3)_2 \cdot 6H_2O$, $UO_2C_2O_4 \cdot 3H_2O$, $UO_2C_2O_4 \cdot H_2O$, and $H_2C_2O_4 \cdot 2H_2O$.

J. Rovtar Leach

Distr: 4E4j/4E2c

K. A. BOLSHAKOV

"METHODS FOR REMOVAL OF RADIOACTIVE SUBSTANCES FROM SEWAGE OF RESEARCH INSTITUTIONS" by K. A. Bolshakov, F. V. Rauzen

Report presented at 2nd UN Atoms-for-Peace Conference, Geneva, 9-13 Sept 1958

SOV/156-58-3-2/52

AUTHORS: Bol'shakov, K. A., Fedorov, P. I., Shakhova, M. N.

TITLE: The Saturation Vapor Pressure of Thallium Chloride (Davleniye nasyshchennogo para khloristogo talliya)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 3, pp. 408-412 (USSR)

ABSTRACT: The saturation vapor pressure of thallium chloride was determined according to two methods: the method of boiling points, and the method of saturated current (metod potoka nasyshcheniya). The use of these two methods made it possible to cover a great temperature range and after analysis of the results obtained to draw conclusions on the molecular state of thallium chloride. The apparatus for the determination of the vapor pressure according to the boiling point method is shown in a scheme and is discussed briefly. Three experimental series were carried out; the results obtained are given in tables and are made use of in the accompanying diagrams. An apparatus built according to the instructions of Gerasimov, Dreving and Komandin (Ref 5) was used for the determination of the saturation vapor pressure.

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Table 2 gives the results calculated for TlCl and Tl_2Cl_2. A comparison of some data from publications with some of the results obtained by the authors of this paper shows that up to 460° C Tl_2Cl_2 is present, and from 620° C upward it is TlCl. Between these two temperatures there exists a mixture of these compounds. Table 3 gives the mean molecular weight of the vapor, the percentage of TlCl molecules, and the logarithm of the respective equilibrium constants of the reaction $Tl_2Cl_2 \rightleftarrows 2\ TlCl$ for four temperatures in this interval. The change of the constant of the equilibrium with the temperature was calculated and shown in a diagram. The boiling point of TlCl is at 818° C, as is shown by the observations made by the authors. There are 4 figures, 3 tables, and 6 references, 2 of which are Soviet.

ASSOCIATION: Kafedra tekhnologii redkikh i rasseyannykh elementov Instituta tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova (Chair for the Technology of Rare and Trace Elements of the Institute of Chemical Fine Technology imeni M.V. Lomonosov)

AUTHORS: Bol'shakov, K. A., Fedorov, P. I., Agashkina, G. D. SOV/78-3-8-28/48

TITLE: The Ternary System of the Chlorides of Sodium, Cobalt, and Nickel (Troynaya sistema iz khloridov natriya, kobal'ta i nikelya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol. 3, Nr 8, pp. 1891-1895 (USSR)

ABSTRACT: By means of thermal analysis the binary system of the chlorides of cobalt and nickel and the ternary system of the chlorides of sodium, cobalt, and nickel were studied. The binary system $CoCl_2$-$NiCl_2$ was examined only in the range of small $NiCl_2$ contents. Uninterrupted solid solutions are formed in this system and a minimum appears on the melting-diagram. The minimum lies at 680°centigrade and 7 per cent $NiCl_2$. Solid solutions do not appear in the ternary system when sodium chloride is present, but there are eutectic points which practically coincide with the points of the binary eutectic of the system NaCl-$CoCl_2$. There are 11 figures and 2 references, 2 of

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which are Soviet.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Institute of Fine Chemical Technology imeni M. V. Lomonosov, Moscow)

SUBMITTED: July 8, 1957

AUTHORS: Bol'shakov, K. A., Fedorov, P. I. SOV/78-3-8-29/48

TITLE: II. The Ternary System of Sodium-, Cobalt-, and Nickel Sulphates (II. Troynaya sistema iz sul'fatov natriya, kobal'ta i nikelya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol. 3, Nr 8, pp. 1896-1900 (USSR)

ABSTRACT: The ternary system of the sulphates of sodium, cobalt, and nickel was studied by means of thermographic analysis. Nine sections were examined. Based on the examinations at hand, the diagram of the ternary system as well as the isotherm of the surface-liquids were plotted at 50° centigrade. In the ternary system the following solid solutions were established: δ- on the basis of $Na_2SO_4CoSO_4$, $Na_2SO_4.NiSO_4$ and β- on the basis of $3Na_2SO_4$, $3Na_2SO_4.NiSO_4$. The melting diagram shows four crystallization fields which correspond to the solid solutions. Uninterrupted solid solutions are formed between the sulphates of cobalt and nickel and the corresponding combinations of these sulphates and sodium sulphate. There are 6 figures and 1 reference, 1 of which is Soviet.

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SOV/78-3-8-29/48

II. The Ternary System of Sodium-, Cobalt-, and Nickel Sulphates

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Institute of Fine Chemical Technology imeni M. V. Lomonosov, Moscow)

SUBMITTED: July 8, 1957

Card 2/2

5.2200(A)

SOV/81-59-12-41611

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 12, p 55 (USSR)

AUTHORS: Bol'shakov, K.A., Korovin, S.S.

TITLE: The Solubility of Uranyl Oxalate in Nitric Acid

PERIODICAL: Tr. Mosk. in-ta tonkoy khim. tekhnol., 1958, Nr 7, pp 165-170

ABSTRACT: The solubility of uranyl oxalate (I) in HNO_3 at 25 and 50°C has been studied by the isothermal method. It has been established that the solubility of I is considerably increased with an increase in the concentration of the acid. HNO_3 dehydrates the 3-water crystal-hydrate; at 25°C and HNO_3 concentrations of $\geq$ 48.5 weight percent, $UO_2C_2O_4 \cdot H_2O$ crystallizes and at 50°C and HNO_3 concentrations of $>$ 47.20% the crystallization of the salt with a smaller quantity of crystallization water than in the trihydrate takes place.

Authors' summary

Card 1/1

PHASE I BOOK EXPLOITATION SOV/5084

International Conference on the Peaceful Uses of Atomic Energy. 2d, Geneva, 1958.

Doklady sovetskikh uchenykh. [t.4] Khimiya radioelementov i radiatsionnykh prevrashcheniy (Reports of Soviet Scientists. v. 4.: Chemistry of Radioelements and Radiation Transformations) Moscow, Atomizdat, 1959. 323 p. 8,000 copies printed. (Series: Its: Trudy)

Ed. (Title page): A. P. Vinogradov, Academician; Ed.: V. I. Labaznov; Tech. Ed.: Ye. I. Mazel'.

PURPOSE: This collection of articles is intended for scientists and engineers interested in the applications of radioactive materials in science and industry.

COVERAGE: The book contains 26 separate studies concerning various aspects of the chemistry of certain radioactive elements and the processes of radiation effect on matter. These reports discuss present-day methods of reprocessing irradiated nuclear fuel, research in the chemistry of mercury, thorium, uranium, plutonium, and americium, problems related to the sorption and burying of radioactive wastes, the radiolysis of aqueous solutions and of organic compounds, the mechanism of polymer chain grafting, and the effect of radiation on natural and synthetic rubbers. V. N. Prusakov edited the present volume. Most of the reports are accompanied by references. Contributors to individual investigations are mentioned in annotations to the Table of Contents.

(3/)

BOL'SHAKOV, K.A.; FEDOROV, P.I.

Fusibility diagram of the antimony sulfide - sodium sulfate system. Izv. vys. ucheb. zav.; tsvet. met. 2 no.2:51-53 '59. (MIRA 12:7)

1.Moskovskiy institut tonkoy khimicheskoy tekhnologii, Kafedra tekhnologii redkikh i rasseyannykh elementov.
(Systems (Chemistry)) (Antimony--Metallurgy)

BOL'SHAKOV, K.A.; FEDOROV, P.I.; STEPINA, L.A.

Fusibility curve for the lithium - lithium nitride system.
Izv.vys.ucheb.zav.; tsvet.met. 2 no.4:52-53 '59.
(MIRA 13:1)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii. Kafedra khimii i tekhnologii redkikh i rasseyannykh elementov.
(Lithium--Thermal properties)
(Lithium nitride--Thermal properties)

5(4)

AUTHORS: Fedorov, P. I., Bol'shakov, K. A. SOV/78-4-4-30/44

TITLE: Reciprocal Ternary System of Chlorides and Sulphates of Sodium and Cobalt (Trojnaya vzaimnaya sistema iz khloridov i sul'fatov natriya i kobal'ta)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 4, pp 892-897 (USSR)

ABSTRACT: The authors plotted the phase diagram of the reciprocal system consisting of chlorides and sulphates of cobalt and sodium. The system is irreversibly reciprocal. Fifteen internal sections of this system, the results of which are contained in figure 2 were investigated. The stable diagonal of the reciprocal system $NaCl-CoSO_4$ bears the nature of a binary system with formation of compounds between the components. The compound $NaCl.2CoSO_4$ is produced in prismatic crystals. The phase diagram of the diagonal section $CoCl_2-Na_2SO_4$ is represented in figure 4. The fifteen internal sections are contained in figures 3 to 9. Seven crystallization ranges were stated in the system: sodium chloride, cobalt chloride, cobalt sulphate, sodium sulphate,

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Reciprocal Ternary System of Chlorides and Sulphates of Sodium and Cobalt

$NaCl.2CoSO_4$ (phase λ), $Na_2SO_4.3CoSO_4$ (phase ε) and $Na_2SO_4.CoSO_4$ (phase δ). The results indicate that only cobalt sulphate is produced by chlorinating calcination of cobalt-containing sulphidic substances. There are 11 figures and 11 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov)

SUBMITTED: January 13, 1958

S/149/60/000/004/010/011/XX
A006/A001

AUTHORS: Urazov, G. G. (Deceased), Bel'shakov, K. A., Titov, V. I.

TITLE: Obtaining Bismuth from Slimes After Refining Lead by Electrolysis

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1960, No. 4, pp. 94-101

p.1.3

TEXT: Electrolytic lead slimes are an important raw material source for bismuth extraction. Hydrometallurgical methods used at some plants have been proposed to reprocess slimes with a relatively poor Bi content. The use of slimes with a high Bi content requires a detailed investigation of some pyrometallurgical methods of bismuth extraction. Experiments were made with slimes of poor Bi content (14.37% Bi, 28.06% Pb, 2.80% Cu, 10.50% Ag and 15.08% Sb + As) and high Bi content (48.32% Bi, 16.93% Pb, 0.33% Cu, 0.62% Ag and 8.21% Sb + As) using the methods of oxidizing melting, oxidizing-reducing roasting, blowing air through the metal to transfer bismuth to litharge and to separate the noble metals, producing Dorée metal. The experiments proved the practical possibility of obtaining bismuth metal from bismuth-containing lead slimes by pyrometallurgical methods and subsequent elimination of antimony and arsenic by air blast and

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S/149/60/000/004/010/011/XX
A006/A001

Obtaining Bismuth from Slimes After Refining Lead by Electrolysis

of lead and silver by cupellation and electrolysis. It is preferable to use the pyrometallurgical method for reprocessing rich slimes containing over 40 - 50% Bi, since the technological process is simpler, more economical and Bi loss is reduced. Crude bismuth is prepared by reducing-melting of the slime with charcoal in the presence of soda (or soda with sodium chloride) as a flux. Melting is conducted at 800 - 900°C. The amount of charcoal is determined by the degree of acidification of the slime. Soda is taken in a double amount of the theoretical quantity required for the formation of arsenates and antimonates of sodium. Under these conditions bismuth passes entirely into the metal together with silver, copper and a great portion of lead. The major portion of antimony and arsenic passes into the gas and slag (about 80%). Crude bismuth is refined of the rest of antimony and arsenic by air blast under a layer of caustic alkali at 500 - 600°C. The metal (170 g) with a Sb + As content of 4.06% (33% from the initial content in the slime) is air blown under a layer of 50 g NaOH for 5 hours. As a result a refined alloy is obtained containing in %: 20.90 Pb; 0.53 Cu, 0.0012Sb + As; 0.80 Ag; 77.77 Bi. Elimination of silver and copper depends on their amount in the crude metal. At a high Ag content in

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S/149/60/000/004/010/011/XX
A006/A001

Obtaining Bismuth from Slimes After Refining Lead by Electrolysis

The crude bismuth melted from poor Bi slimes, cuppelation was used producing copper-bismuth litharge and Dorée metal. There the litharge was dissolved in nitric acid and basic bismuth nitrate was obtained. At a high content of silver and copper, cappelation may prove inexpedient. In this case copper, lead and silver can be separated from Bi by electrolysis of chloride solutions under the following conditions: $D_{anode} = D_{cathode} = 150 - 200$ amp/m^2; a crude bismuth plate used as an anode, a graphite plate as a cathode; electrolyte: $BiCl_3$ solution containing 150 g/l Bi and 120 g/l HCl. An analysis of the product showed the absence of Sb and As, a content of 0.09% Cu, 0.053% Pb; the rest - Bi (about 99.8%). Ag and other impurities were not determined. There are 2 diagrams, 6 tables and 4 references, 1 English and 3 Soviet.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology). Kafedra khimii i tekhnologii redkikh i rasseyanykh elementov (Department of Chemistry and Technology of Rare and Dispersed Elements).

SUBMITTED: October 9, 1959

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5(2)

AUTHORS: Bol'shakov, K. A., Dergunova, G. M. SOV/78-5-1-33/45

TITLE: Investigation of Solubility in the Ternary System $NaNO_3$ - $CsNO_3$ - H_2O at 25 and 50°

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 1, pp 209-213 (USSR)

ABSTRACT: As there are only data available in publications on the binary systems of the components of the ternary system mentioned in the title, the authors investigated the latter. Results are contained in tables 1-3. The isothermal lines of solubility for 25 and 50° are illustrated in figures 1 and 2. Microphotographs of the crystalline phases are shown in figure 3. The isothermal lines consist of two branches reflecting the separation of the anhydrous salts $NaNO_3$ and $CsNO_3$. Within the temperature range under consideration the authors did not detect either solid solutions or double salts. There are 3 figures, 3 tables, and 18 references, 4 of which are Soviet.

SUBMITTED: August 8, 1958

Card 1/1

URAZOV, G.G. [deceased]; BOL'SHAKOV, K.A.; FEDOROV, P.I.; VASILEVSKAYA, I.I.

Ternary system antimony - iron - sulfur (on the theory of precipitation smelting). Zhur.neorg.khim. 5 no.2:449-455 F '60. (MIRA 13:6)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni M.V. Lomonosova.

(Antimony) (Iron) (Sulfur)

BOL'SHAKOV, K.A.; FEDOROV, P.I.

Reciprocal system of sodium and nickel chlorides and sulfates. Zhur.neorg.khim. 5 no.2:469-473 F '60. (MIRA 13:6)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova.

(Systems (Chemistry))

AUTHORS: Urazov, G. G. (Deceased), Bol'shakov, K. A., Fedorov, P. I., Vasilevskaya, I. I. S/078/60/005/03/022/048 B004/B015

TITLE: The Ternary System Bismuth - Iron - Sulfur. (On the Theory of the Precipitating Melt of Bismuth)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 3, pp 630-636 (USSR)

ABSTRACT: It is the aim of the present study to investigate the interaction and the mutual solubility of the components of the reaction $Bi_2S_3 + 3Fe = 3FeS + 2Bi$ to define the conditions of this reaction which is of great importance for the metallurgy of bismuth. The authors describe the preparation of the melts and present the diagrams of the binary systems Fe - Bi (Fig 1), Fe - S (Fig 2) known from publications as well as the diagram of the system Bi - S (Fig 3) which was corrected by them. The existence of the compound BiS assumed by Ya. I. Gerasimov (Ref 7) was not confirmed. Only Bi_2S_3 (Fig 4) is separated from the melt. Five sections of the system Bi - Fe - S were subjected to a thermal analysis by means of a Kurnakov pyrometer. Their position is shown in figure 5, and the results are diagrammatically represented in figures 6-10. Figure 11 shows the limit of the dissociation zone, and figure 12 the melting-point diagram of that part of the system in which Bi

Card 1/2

The Ternary System Bismuth - Iron - Sulfur. (On the Theory of the Precipitating Melt of Bismuth)

S/078/60/005/03/022/048
B004/B015

is precipitated, as obtained on the basis of experimental data. This part is divided by the section Bi - FeS into two ternary systems in which the crystallization of all melts ends with the formation of a ternary eutectic. Results and thermodynamic calculations prove the practically irreversible course of the reaction. V. N. Levina, V. A. Antsibor, and M. V. Ushakova assisted in the experiments. There are 12 figures and 7 references, 2 of which are Soviet.

SUBMITTED: December 29, 1958

Card 2/2

BOL'SHAKOV, K.A.; YEREMIN, Yu.G.; YEVSTIGNEYEVA, R.P.

Structure of a compound of gallium chloride with methylene blue.
Izv.AN SSSR.Otd.khim.nauk no.5:745-749 My '61. (MIRA 14:5)

1. Institut tonkoy khimicheskoy tekhnologii im. M.V.Lomonosova.
(Gallium compounds) (Methylene blue)

BOL'SHAKOV, K.A.; YEREMIN, Yu.G.; BARDIN, V.A.

Preparation and properties of a complex of gallium chloride with methylene blue. Izv.AN SSSR.Otd.khim.nauk no.6:945-950 Je '61. (MIRA 14:6)

1. Institut tonkoy khimicheskoy tekhnologii im. M.V.Lomonosova.
(Gallium compounds) (Methylene blue)

FEDOROV, P.I.; BOL'SHAKOV, K.A.

Fusibility diagram for the system cobalt chloride - cobalt sulfate. Zhur. neorg. khim. 5 no.3:757-758 Mr '60. (MIRA 14:6)
(Cobalt chloride)
(Cobalt sulfate)

BOL'SHAKOV, K.A.; POKROVSKIY, B.I.; PLYUSHCHEV, V.Ye.

Binary systems constituted by alkali nitrates. Zhur.neorg.khim. 6 no.9:2120-2125 S '61. (MIRA 14:9)
(Alkali metal nitrates) (Systems (Chemistry))

BOL'SHAKOV, K.A.; POKROVSKIY, B.I.; PLYUSHCHEV, V.Ye.

Fusibility of the system consisting of sodium, cesium and strontium nitrates. Zhur.neorg.khim. 6 no.10:2347-2352 O '61. (MIRA 14:9)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni M.V. Lomonosova.

(Sodium nitrate) (Cesium nitrate) (Strontium nitrate)

30177
S/078/61/006/012/003/011
B110/B147

18.1210 2408

AUTHORS: Bol'shakov, K. A., Fedorov, P. I., Smarina, Ye. I., Smirnova, I. N.

TITLE: Study of the common solubility of magnesium and gallium in aluminum

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 12, 1961, 2727-2731

TEXT: The authors studied the ternary system aluminum - magnesium - gallium, and examined the common solubility of magnesium and gallium in aluminum at 290, 240, and 20°C. The alloys were molten from 99.6 and 99.9% Al, 99.91% Mg, and 99.97% Ga with a flux consisting of 46% of $MgCl_2$, 35% of KCl, 8% of $CaCl_2$ + NaCl, and 11% of $BaCl_2$. For 14 days to 3 months, the samples were annealed in evacuated glass ampuls and tempered in water. The common solubility was determined by microstructural analysis (etching agent: 2.5% HNO_3; 2.0% NaOH) and by determination of hardness according to Vicker (diamond pyramid, load: 10 kg). When the equilibrium limit of

Card 1/● 2

Study of the common solubility of ...

homogeneity is reached, separations in the second phase increase, whereas the content of incidental impurities in phase transition remains unchanged. Microstructural studies showed the following phase regions: (1) limit of the homogeneous aluminum-base solid solution, α_{Al}; (2) two-phase regions: $\alpha + \beta$, $\alpha + z$, $\alpha + Mg_2Ga$, $\alpha + MgGa_2$, $\alpha + Ga$; (3) three-phase regions: $\alpha + \beta + z$; $\alpha + z + Mg_2Ga$; $\alpha + Mg_2Ga + MgGa$. The solid aluminum-base solution was found by alkaline etching, the β-phase (slightly yellow) and z-phase (black) were found by weak HNO_3 (2.5%), Mg_2Ga and $MgGa_2$ phases were found by alkaline etching. Transitions from homogeneous into binary and ternary and from binary into ternary regions were characterized by salient points in the composition - hardness curves. This is in good agreement with data obtained by microstructural analysis. In the region of low Ga additions (< 1% by weight), the common solubility of Mg and Ga first increases at all temperatures, and then slightly drops again. It increases rapidly when the Al -Ga side is approached. There are 8 figures and 10 references: 1 Soviet and 9 non-Soviet. The two references to English-language publications read as follows: M. Hansen, Constitution of binary alloys, 1958, 105; I. Clare, J. Inst. Metals, 86, 43; (1957)

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BOL'SHAKOV, K.A.; SERYAKOV, G.V.

Extraction of gallium and aluminum from hydrochloric acid solutions by oxygen-containing organic solvents. Zhur. prikl. khim. 34 no.5:1021-1028 My '61. (MIRA 16:8)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

(Gallium) (Aluminum)

BOL'SHAKOV, K.A.; PLOTKIN, S.Ya.

Lomonosov Institute of Fine Chemical Technology in Moscow. Vop.-ist.est.i tekh. no.12:160-161 '62. (MIRA 15:4)
(Moscow--Chemical engineering)

S/078/62/007/003/010/019
B110/B138

18.1245

AUTHORS: Bol'shakov, K. A., Fedorov, P. I., Smarina, Ye. I.

TITLE: Equilibrium in the Mg-rich part of the Mg-Al-Ga system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 3, 1962, 609-614

TEXT: The constitution diagrams of Mg-rich alloys of the Mg-Al-Ga system were examined by thermal (Kurnakov pyrometer) and microstructural analyses, as well as hardness and microhardness tests. Mg (99.91%) AL (99.6%) Ga (99.9%) were alloyed under a fluxing agent of the following composition: $MgCl_2$, 46%; KCL, 35%; $CaCl_2$ + NaCl, 8%; $BaCl_2$, 11%. The equilibrium in the solid state and the joint solubility of Ga and Al at 340, 280, and 240°C were determined in samples annealed for 3-4 days at 360°C, then soaked for 40 - 100 days at the required temperature, and finally quenched in ice water. A 1% solution of HCl and HNO_3 was the etching medium for microstructural analysis. Hardness measurements were made on a Vickers tester (5 kg), and microhardness on a ПМТ-3 (PMT-3) apparatus (50 and 20 g). Five radial sections with constant Ga-to-Al ratio (1 : 9, 1 : 4, 2 : 3, 3 : 2,

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S/070/62/007/003/010/019
B110/B138

Equilibrium in the Mg-rich part...

4 : 1) were examined, and one passing through the points of the compounds Al_3Mg_4 and Mg_5Ga_2. In sample 1:9, the constitution diagram consists of the primary crystallization lines of the δ-solid solution on Mg base and primary precipitation of the γ-phase with a flat peak at 460°C. The two lines intersect at 67.5% of Mg and 435°C. A wide γ-δ two-phase range exists in the solid state. A homogeneous zone of the γ-phase is believed to exist at 50-57% weight Mg. In ratio 1 : 4, the liquidus consists of the precipitation lines of the δ-solid solution and the γ-phase which intersect at 66.5 wt % Mg and 425°C. The maximum of the γ-phase liquidus curve falls to 454°C. In the $\delta+\gamma+Mg_5Ga_2$ three-phase range (ternary eutectic at 360°C) and $\delta+\gamma$ two-phase range sections it was found that in ratio 2 : 3 the $\delta+\gamma$ range was remarkably narrow in the solid state. In ratio 3 : 2 the liquidus line corresponded to the crystallization of the δ-solid solution and the γ-phase. In the $\delta+Mg_5Ga_2$ range, in ratio 4 : 1 the liquidus consists of the line of primary precipitation of the solid solution on Mg base, and of the binary Mg_5Ga_2 compound. The intersection point was at 57.5 wt % Mg and 405°C. The section $\delta+\gamma+Mg_5Ga_2$ and $\delta+Mg_5Ga_2$ was taken. Since the Al_3Mg_4-Mg_5Ga_2 section

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intersects the radical cuts proceeding from the Mg vertex of the triangle (Fig. 2), its examination complements that of the remaining sections. The diagram (Fig. 3,a) is quasibinary (eutectic at 388°C). The microhardness of the six samples was 293 - 307 kg/mm^2, and that of the Mg_5Ga_2 phase 242 - 256 kg/mm^2. The Al_3Mg_4 - Mg_5Ga_2 section in the Mg-Al-Ga system is quasibinary and cuts off the triangle Mg-Al_3Mg_4-Mg_5Ga_2 representing an elementary ternary system. The crystallization field of the solid solution on Mg base, lying on the liquidus surface of this system, is adjacent to the crystallization fields of the γ-phase of Al-Mg and of Mg_5Ga_2 of Mg-Ga. The lines of the monovariant equilibrium E_1E, E_2E, E_3E correspond to the reactions liq $\rightleftharpoons \delta + \gamma$, liq $\rightleftharpoons \delta +$ Mg_5Ga_2, liq $\rightleftharpoons \gamma +$ Mg_5Ga_2. The point of equilibrium was found at 62 wt % Mg, 26 wt % Ga, 13 weight % Al, and 380°C. Combined solubility, showed a decrease from 9.5 (Al + Ga) at 340°C to 4 wt % at 20°C. K. I. Marinina is thanked for assistance in the experiments. There are 7 figures and 11 references: 1 Soviet and 10 non-Soviet. The three references to English-language publications read as follows: M. Hansen. Constitution of binary alloys, 1958, p. 105. V. Hume-Rothery, G. Raynor. J.

BOL'SHAKOV, K.A.; BUL'ONKOV, N.A.; TSIRLIN, M.S.

New polymorphic conversion of Mg_3Sb_2. Zhur.neorg.khim. 7 no.9:2271-2272 S '62. (MIRA 15:9)

(Magnesium antimonide) (Polymorphism)

Solid solutions of Mg_3Sb_2 with Mg_2Si and Mg_2Sn. K. A. Bol'shakov, P. A. Bul'onkov, L. N. Rastorguyev, M. S. Tsirlin.

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

Solid solutions in the quasi-binary cross-sections of the ternary systems of diagrams of magnesium with group IV elements. K. A. Bol'shakov, Ye. S. Makarov, Ye. A. Sokolova, V. I. Fistul', V. K. Prokof'yeva.

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

L 10653-63
EWP(q)/EWT(m)/BDS--AFFTC/ASD--JD
ACCESSION NR: AP3001219

S/0078/63/008/006/1412/1418

AUTHOR: Bol'shakov, K. A.; Fedorov, P. I.; Smarina, Ye. I. 56

TITLE: Beta prime phase of aluminum-magnesium system.

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 6, 1963, 1412-1418

TOPIC TAGS: aluminum, magnesium, microhardness, interplanar distances, Ga, In, Tl

ABSTRACT: The section of the Al-Mg diagram between 35-50 wt. % Mg was investigated. The Beta prime phase was formed by cooling melts containing 40-43 wt. % Mg at about 2.5 degrees per minute; more rapid cooling gave Gamma and Gamma + Beta phases; cooling at 0.5 degrees per minute crystallized the Beta + Gamma phases in a eutectic environment. Microhardness and interplanar distances were measured in poured samples (41-41.5% Mg, Beta prime phase) prepared under incomplete annealing. A study of the possibility of stabilizing the Beta prime phase in crystallization from the melt by addition of Ga, In or Tl showed that only Ga stabilized effectively. "In conclusion, we thank Ye. S. Makarov for help and consultation in conducting the X-ray investigations. Orig. art. has: 4 tables and 4 figures.

ASSOCIATION: none

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BOL'SHAKOV, K.A.; FEDOROV, P.I.; IL'INA, N.I.

Binary systems of sodium sulfate with copper (II) and iron (III) sulfates. Zhur. neorg. khim. 8 no.11:2577-2579 N '63.
(MIRA 17:1)

BOL'SHAKOV, K.A.; BUL'ONKOV, N.A.; RASTORGUYEV, L.N.; TOIKKA, M.S.

System $Mg_2Si - Mg_3Sb_2$. Zhur. neorg. khim. 8 no.12:2705-2709 D '63.
(MIRA 17:9)

L 8834-65 EWT(m)/EPR/EWP(q)/EWP(b) Ps-4 ASD(m)-3/AS(mp)-2 JD

ACCESSION NR: AP4043575 S/0078/64/009/008/1883/1897

AUTHOR: Bol'shakov, K. A.; Fedorov, P. I.; Smarina, Ye. I.; Smirnova, I. N.

TITLE: The Al-Mg-Ga system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1883-1897

TOPIC TAGS: aluminum magnesium gallium system, ternary alloy, alloy phase diagram, alloy phase structure

ABSTRACT: Alloys of the Al-Mg-Ga system in the as-cast, quenched, and annealed conditions were investigated by thermal analysis and x-ray diffraction pattern examination. The compositions of investigated alloys melted from 99.6 or 99.9% pure Al, 99.9% pure Mg, and 99.97% pure Ga were along the sections parallel to the Al-Mg side of the concentration triangle and had a constant Ga content of 5, 10, 15, 20, 25, 30, and 35 wt%. In addition, Al-Mg_5Ga_2, Mg_5Ga_2—36% Mg, 66% Al sections, and a section with a constant 25 wt% Mg content were investigated. On the basis of the obtained results, phase diagrams of the Al-Mg-Ga system and investigated sections, and the isotherms at

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L 8834-65

ACCESSION NR: AP4043575

300 and 20C were plotted (see Fig. 1 of the Enclosure). In the Al-Mg-Ga phase diagram a ternary intermetallic phase, Z, which forms an extensive region of solid solutions and can be regarded as a berthollide-type phase, was identified. The structure of the Z phase is highly similar to the structure of the β phase obtained under conditions of incomplete annealing of the Al-Mg system. At the temperature of the liquids' surface, the Al-Mg-Ga diagram is characterized by the absence of strictly binary sections and by the presence of quasi-binary sections. In solid condition, however, two-phase regions are clearly distinguishable between adjacent single-phase regions. Orig. art. has: 13 figures and 1 table.

ASSOCIATION: none

SUBMITTED 29May63 ATD PRESS: 3106 ENCL: 01

SUB CODE: MM NO REF SOV: 005 OTHER: 009

Card 2/3

L 8834-65

ACCESSION NR: AP4043575

ENCLOSURE: 0

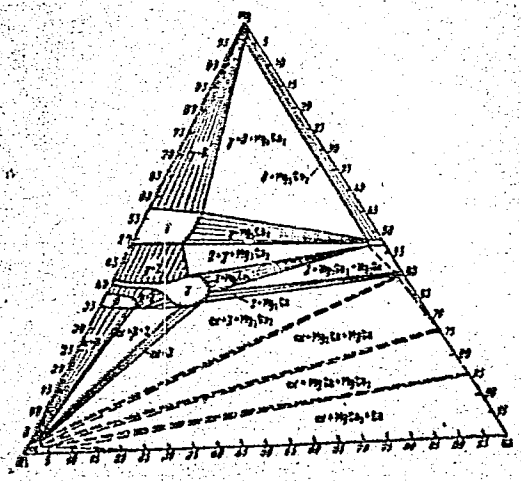

Fig. 1. Phase distribution in the Al-Mg-Ga system at 20C

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DORFMAN, V.F.; BOL'SHAKOV, K.A.; KISLYAKOV, I.P.

Transport reactions in germanium precipitation by the iodide method. Izv. AN SSSR. Neorg. mat. 1 no.1:37-46 Ja '65. (MIRA 18:5)

L 52623-65 EWT(l)/EWT(m)/EWP(i)/T/EWP(t)/EEC(b)-2/EWP(b) Pi-4 IJP(c)
JD/GG

ACCESSION NR: AP5014074 UR/0363/65/001/004/0471/0477

AUTHOR: Dorfman, V. F.; Bol'shakov, K. A.; Kislyakov, I. P. 39 37 B

TITLE: Conditions of crystallization of deposits from the gas phase in transport reactions

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 4, 1965, 471-477

TOPIC TAGS: epitaxial growing, germanium film, transport chemical reaction, mass transfer, crystal growth

ABSTRACT: The mechanisms of the transport of reagents in the gas phase and the possibility of controlling mass transfer in transport chemical methods have been studied by taking as an example the method of growing epitaxial films of germanium, based on the reversibility of the reaction

$$GeI_4\ gas + Ge_{solid} \rightleftarrows 2GeI_2\ gas$$

A formula is proposed for an approximate estimate of the critical velocity of a gas stream below which it is necessary to take into account the role of diffusion in the

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transport of the gaseous reagents.

$$v_c = \sqrt{D \cdot v_i \left| \frac{d^2 f(l/v_i)}{dl^2} \right| \left| \frac{df(l/v_i)}{dl} \right|}$$

In the iodide process of growth of germanium films in a horizontal gas stream, iodine and germanium iodides separate into phases in the source zone, and the diiodide and tetraiodide do so in the substrate zone. These effects lead respectively to the slowing down of iodination and to the nonuniformity of the epitaxial deposition on a vertical substrate. The uniformity of deposition is promoted by an inclined position of the substrate in the tube, a regular decrease in temperature along the axis of the deposition zone, and an increase in the rate of gas flow. The latter two factors also improve the homogeneity of the film thickness on various substrates in the same process, and the increase in flow rate accelerates the process. By alternating the regions of deposition with small source zones, one can achieve a multizone deposition from a single gas stream. A continuous deposition of epitaxial films can be achieved by means of a parallel arrangement of the source and substrates in the reaction tube, a suitable temperature gradient being present between them. "The authors express their appreciation to A. M. Anisimove,

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206130003-6"

L 52623-65

ACCESSION NR: AP5014074 2

G. S. Banina, and M. S. Belokon' for their participation in the experimental work."
Orig. art. has: 4 figures and 8 formulas.

ASSOCIATION: none

SUBMITTED: 20Jan65 ENCL: 00 SUB CODE: GC, SS

NO REF SOV: 008 OTHER: 000

282

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L 10[illegible]-65 EEC(b)-2/EWA(c)/EWT(l)/EWT(m)/EWP(b)/T/EWP(t) Pi-4 IJP(c) GG/JD

ACCESSION NR: AP5011472 UR/0076/65/039/004/0996/1000

AUTHOR: Dorfman, V. F.; Kislyakov, I. P.; Bol'shakov, K. A.

TITLE: Reaction kinetics in the iodide method of growing epitaxial germanium layers

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 4, 1965, 996-1000

TOPIC TAGS: germanium crystal, epitaxial germanium layer, crystal cultivation, iodide method, reaction kinetics, disproportionation reaction

ABSTRACT: The kinetics of the iodide process under dynamic conditions was studied in a horizontal quartz tube with hydrogen as the carrier of iodine. The substrates were germanium plates cut out of a single crystal along the (111) plane. The degree to which equilibrium was established in the zone of the source was measured by the ratio R = total consumption of germanium/total consumption of iodine. At sufficiently small R, the growth rate of germanium layers can assume even negative values, i.e., gaseous etching of the substrates begins. The temperature effect on the growth is expressed by the equation

$$v = [(8{,}2 \pm 0{,}5) \cdot 10^{3} \cdot e^{-10000/RT} - (2{,}8 \pm 0{,}2) \cdot 10^{4} \cdot e^{-21000/RT}] (\mu/\text{час}),$$

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L 48986-65

ACCESSION NR: AP5011472

where v is the rate of epitaxial growth. The dependence of the growth rate on the initial concentration of iodine vapors and hence GeI_2 vapors indicates that the disproportionation GeI_2 (s) + GeI_2 (g) $\rightleftarrows$ Ge (s) + GeI_4 (g) is a first-order, heterogeneous reaction. The nature of the distribution of the growth rate along the length of the reaction tube can be adjusted within certain limits by changing the temperature curve in the deposition zone. Orig. art. has: 7 figures and 7 formulas.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonsova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 01Apr64 ENCL: 00 SUB CODE: SS, IC

NO REF SOV: 004 OTHER: 001

Card 2/2 mb

L 54029-65 EWP(e)/EWT(m)/EWP(t)/EWP(b)/EWP(i) IJP(c) JD

ACCESSION NR: AP5013525 UR/0076/65/039/005/1248/1251
541.124/.128

AUTHOR: Dofman, V. F.; Kislyakov, I. P.; Bol'shakov, K. A.

TITLE: Doping of germanium layers during growth by the iodide method

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 5, 1965, 1248-1251

TOPIC TAGS: germanium film, epitaxial growth, germanium doping, gallium iodide, germanium iodide

ABSTRACT: The authors used antimony as the donor impurity and boron, aluminum, and gallium as the acceptor impurities. Attempts to dope germanium with boron and aluminum were unsuccessful. Gallium was iodinated under dynamic conditions in a laminar gas flow to study the equilibrium in the Ga-I system at various temperatures. The equilibrium constant K_p for the reaction $GaI_3 + Ga \rightleftarrows 3GaI$ was calculated for the 600--900°C range. The effect of temperature on the equilibrium atomic ratio of iodine to gallium and the relationship between $\log K_p$ and the reciprocal temperature $1/T$ indicate the possibility of the following reactions for gallium:

$$^2/_3Mo + {}^1/_3MoJ_3 \rightleftharpoons MoJ,$$
$$^2/_3Mo + {}^2/_3MoJ_3 \rightleftharpoons MoJ_3,$$

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L 54029-65

ACCESSION NR: AP5013525

Experimental data show that the following reactions also occur for gallium:

$$Me + {}^1/_2GeJ_2 \rightleftharpoons MeJ + {}^1/_2Ge,$$
$$Me + {}^3/_2GeJ_2 \rightleftharpoons MeJ_3 + {}^3/_2Ge,$$
$$MeJ + GeJ_2 \rightleftharpoons MeJ_3 + Ge,$$

Orig. art. has: 3 figures and 16 formulas.

ASSOCIATION: none

SUBMITTED: 01Apr64 ENCL: 00 SUB CODE: GC

NO REF SOV: 001 OTHER: 004

Card 2/2

L 4173-66 EWT(d)/EWT(m)/EWA(d)/EWP(v)/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b)/
ACC NR: AP5025694 EWP(1) JD SOURCE CODE: UR/0286/65/000/018/0041/0041

INVENTOR: Bol'shakov, K. A.; Bul'yenkov, N. A.; Rastorguyev, L. N.; Tsirlin, M. S.

ORG: none

48
B

TITLE: Material for the positive arm of a thermocouple. Class 21, No. 174679

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 41

TOPIC TAGS: thermocouple, high temperature material

ABSTRACT: The proposed material is intended to improve thermocouple operation in the region of high temperatures. It is prepared from a solid solution of Mg_3Sb_2-Mg_2Si.

[DW]

SUB CODE: IE,MM/SUBM DATE: 13Mar62/ ORIG REF: 000/ OTH REF: 000/ ATD PRESS: 4129

Card 1/1 Mcl

UDC: 621.362.1

BOL'SHAKOV, K.A.; SAFONOV, V.V.; KOGAN, L.M.; SHEVTSOVA, Z.N.; SHADROVA, L.G.

Solubility of chloro derivatives of some metals in 1,3-hexachlorobutadiene. Zhur. fiz. khim. 38 no.5:1305-1306 My '64. (MIRA 18:12)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova i Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy. Submitted June 7, 1963.