

MIKULINSKIY, A. S.

MIKULINSKIY, A. S., GEL'D, P. V., IVANOV, V. K.
36081 Temperaturnoye pole v odnoelektrodnoy pechi. V sb: Teoriya i praktika rudnoy
elektrotermii. Sverdlovsk-Moskva, 1948, S. 72-75.

SO: Letopis' Zhurnal' nykh Statey, No. 49, 1949

MIKULINSKIY, A. S.

MIKULINSKIY, A. S., IVANOV, V. K., I G.A.L'D, P. V.
36091 Elektricheskoye pole v dvukhelektrodnoy pechi. V sb: Teoriya i praktika
rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 76-78.

SO: Letopis' Zhurnal' nykh Statey, No. 49, 1949

MIKULINSKIY, A. S.

MIKULINSKIY, A. S. I IVANOV, V. K.
36128 K raspredeleniyu toka v rudnotermicheskikh pechakh. V sb: Teoriya i praktika
rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 79-80.

SO: Letopis' Zhrunal' nykh Statey, No. 49, 1949

MIKULINSKIY, A.S.

MIKULINSKIY, A. S. I IVANOV, V. K.

36089 Analiz elektricheskogo polya v odnofaznoy pechi s tochki zreniya teorii podobiya
V sb: Teoriya i praktika rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 81-82.

SO: Letopis' Zhurnal' nykh Statey, No. 49, 1949

MIKULINSKIY, A. S.

MIKULINSKI , A. S., GEL'D, P. V. I IVANOV, V. K.
36090 Temperaturnoye pole Kerna grafitirovochnoy pechi. V sb: Teoriya i praktika
rudnoy elektrotsermi. Sverdlovsk-Moskva, 1948, S. 83-90.-Bibliogr: 8 nazv.

SO: Letopis' Zhurnal: nykh Statey, No. 49, 1949

MIKULINSKIY, A. S.

MIKULINSKIY, A. S., YUMANOVA, L. V. I GEL'D, P. V.
36181 O temperature shikhty i davlenii gazov v karbidnoy pechi. V sb: Teoriya i praktika
rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 91-94.

SO: Letopis' Zhrunal'nykh Statey, No. 49, 1949

MIKULINSKIY, A. S.

Mikulinskiy, A. D. "The upper temperature limit in mine furnaces ", (Report), Soobshch
o nauch. rabotakh chlenov Vsesoyuz, khim. o-va im. Mendeleyeva, 1949, Issur 1, p. 22-23.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

MIKULINSKIY, A. S. and YURANOVA, I. V.

Mikulinskiy, A. S. and Yuranova, I. V. "The method and results of investigation of the space under the electrodes of a carbide furnace", (Report, Sobshch. o nauch. rabotakh chlenov Vsesoyuz. khim. o-va im. Mendeleyeva, 1949, Issue 1, p.23-25.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

J

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1107

Mikuliński A. Electron Microscope

„Mikroskop elektronowy”. Przeglad Techniczny. No. 4. 1961.
pp. 161—171, 22 figs.

Brief survey of the development of the microscope. Improvements introduced in the course of recent decades. Physical principles of operation of the optical and electron microscopes. Constructional details. Principles of operation. Electron lenses: electrostatic and electromagnetic; advantages and deficiencies, range of application. Hot and cold cathodes as a source of emission of electrons. Diagrams and sections through the electron microscope. Design and operation of pumps to produce the necessary vacuum inside the microscope. Relative simplicity of attending to this accurate and complicated apparatus.

ASM

91-4. Role of the Aggregation State
of Hard-to-Reduce Oxides During
Their Reduction by Carbon in Indus-
trial Furnaces. (In Russian.) A. S.
Mikulinski. *Zhurnal Prikladnoi Khim-*
ii, v. 24, Dec. 1951, p. 1235-1245.
Various problems connected with
the production of materials such as
Si from SiO₂. The vapor stage of
SiO was found to be very impor-
tant. 16 ref. (C21)

MIKULINSKIY, A.S.

Role of the state of aggregation of difficulty soluble oxides in their reduction by carbon in industrial furnaces. Zhur. Priklad. Khim. 24, 1234-45 '51; J. Appl. Chem. (U.S.S.R.) 24, 1399-1411 '51 [Engl. translation]. (MIRA 4:11)
(CA 47 no.18:9229 '53)

1. Ural Chem. Research Inst., Unikhim.

MIKULINSKIY, A.S.

USSR/Chemical Technology - Chemical Products and Their Applications, Mineral Salts. Oxides. Acids. Bases. I-6

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8790

Author : Yumanova, L.V. and Mikulinskiy, A.S.

Inst : Uralsk Science Research Chemical Institute.

Title : Phase Changes and Chemical Changes in the Charge During the Reduction of Oxides of Calcium and Silicon by Carbon.

Orig Pub : Tr. Ural'skogo n-i. khim. in-ta, 1954, No 2, 166-176

Abstract : A laboratory method has been developed for the investigation of the reduction of the oxides taking into account the filtering effect of the charge in industrial furnaces using electrodes inserted in the charge. Some information has been obtained on the reduction of CaO and the mechanism of the reduction process. Most of the CaC₂ is formed in the lower high-temperature zone of the furnace where the liquid phase collects. An increase in temperature from 1800 to 1900° increases the conversion to carbide

Card 1/2

USSR/Chemical Technology - Chemical Products and Their
Application, Mineral Salts. Oxides. Acids. Bases.

I-6

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8790

above 10-30%. The excess C in the top carbonaceous layer of the charge is the product of the dissociation of CaC_2 . The C and elementary Ca diffuse to the upper layers of the charge and cover the surface of the CaO and C chunks and diffuse into the interior of the latter. SiO_2 and its dissociation products are reduced in the vapor state. When sufficient iron filings are added to the charge to form 45% FeSi, metallic beads are formed, the carborization of the Fe being accompanied by its enrichment in Si in the upper layers of the charge at 1100-1200°.

Card 2/2

MIKULINSKIY, A.S.

137-58-5-9288

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 72 (USSR)

AUTHOR: ~~Mikulinskiy, A.S.~~

TITLE: Combining an Electrochemical and a Thermal Process (Illustrated by the Process in Which Calcium is Obtained From a Copper-calcium Alloy) [Kombinirovaniye elektrokhimicheskogo i termicheskogo protsessov (Na primere polucheniya kal'tsiya cherez splav yego s med'yu)]

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957, Nr 4, pp 184-193

ABSTRACT: A description of pilot-plant tests of a Ca-manufacturing process involving two stages: 1) electrolysis of fused chlorous salts of Ca and K with Ca being deposited on a liquid Cu-Ca alloy covering the cathode; 2) vacuum distillation of the alloy which, at that point, contains up to 80% Ca. The selection of Cu as an alloying component is explained. The design of an electrolytic bath and of a vacuum-distillation furnace is shown. A procedure developed for this process is described. L. P.
1. Calcium--Production 2. Calcium-copper alloys--Processing 3. Electrochemistry--Applications 4. Electrolysis--Applications 5. Furnaces--Design 6. Electrolytes--Properties

Card 1/1

MIKULINSKIY, A.S.

137-58-5-9291

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 72 (USSR)

AUTHORS: Mikulinskiy, A.S., Yefremkin, V.V., Selyanskiy, A.P.
Serebrennikova, M.A.

TITLE: Loading of a Calcium Carbide Bearing Charge Into a Hot
Furnace (Zagruzka shikhty, soderzhashchey karbid kaltsiya,
v goryachuyu pech')

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957, Nr 4, pp 200-202

ABSTRACT: In order to achieve conditions conducive to safety in the loading of a charge containing CaC_2 into a hot furnace, a number of experiments was conducted at temperatures ranging from 950°C to 1150° on a pilot-plant furnace with a charge containing NaCl and CaC_2 . Pure NaCl , thoroughly heated for 1-1.5 hrs at a temperature of $500-600^\circ$, was employed during the experiments together with waste products of high-purity CaC_2 (particle size 0.2 mm) containing about 65% CaC_2 . The charge was subjected to briquetting under a pressure of 30 kg/cm^2 . The furnace in which the experiments were conducted consisted of a cylindrical housing with an internal lining of fireclay brick. A Fe retort vessel 140 mm in diameter was placed into the furnace. It was

Card 1/2

137-58-5-9291

Loading of a Calcium Carbide Bearing Charge Into a Hot Furnace

established that a backfire occurred 2-5 minutes after an entire charge weighing approximately 4 kg had been introduced in one batch into the furnace which was inclined at an angle of 25°; a portion of the charge would occasionally be ejected from the furnace. When a small portion of the charge (particularly if the charge had not been briquetted) was placed into the furnace, flames formed over it and subsequent charging proceeded without backfire. Therefore, in order to eliminate the hazard connected with the loading of charges containing CaC_2 into a hot furnace, it is imperative that only a small portion be introduced into the furnace initially, followed by the rest of the charge in small batches only after an open flame has appeared.

G.S.

1. Electric furnaces--Operation
2. Transformers--Operation

Card 2/2

SOV/137-58-10-20714

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 54 (USSR)

AUTHORS: Mikulinskiy, A.S., Germaidze, M.S.

TITLE: Production of Metallic Potassium by the Carbide Method at Elevated Residual Pressures (Polucheniye metallicheskogo kaliya karbidnym metodom pri povyshennykh ostatochnykh davleniyakh)

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957 (1958), Nr 5, pp 36-38

ABSTRACT: In order to simplify the design of furnaces, particularly of the continuous type, a study was made of the possibility of producing K at elevated residual pressures. Ar and N are used as the inert gases. It proved possible to recover K with adequate yields at 50-100-mm Hg residual pressure of the inert gas.

L.P.

1. Potassium--Production 2. Neon--Applications 3. Argon--Applications
4. Furnaces--Design

Card 1/1

SOV/137-58-9-18756

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 86 (USSR)

AUTHORS: Mikulinskiy, A.S., Selyanskiy, A.P.

TITLE: Continuous and Semicontinuous Vacuum Furnaces for Light-metals Extraction (Vakuumnyye pechi poluneprreryvnogo ili nepreryvnogo deystviya dlya polucheniya legkikh metallov)

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957 (1958), Nr 5, pp 39-55

ABSTRACT: A description is offered of experimental vacuum furnaces for the recovery of small quantities of light metals (≤ 1 kg). The furnaces work batch-wise or continuously and have graphite crucibles. Heating is by transmitting a current through the charge and an electrode or by burning a fuel. Experiments in the recovery of K, Na, and Mg and in the distillation and rectification of the metals obtained, for the purpose of cleaning them, are described. Special attention is given to equipment design for the purpose of maintaining the vacuum during the production process.

Card 1/1

1. Vacuum furnaces--Design 2. Vacuum furnaces--Equip-ment 3. Vacuum furnaces--Operation 4. Metals-Processing Ya.K.

SOV/137-58-10-20713

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 54 (USSR)

AUTHORS: Mikulinskiy, A.S., Serebrennikova, M.A.

TITLE: Production of Potassium and Sodium by Reduction of the Sulfates With Iron Filings (Polucheniye kaliya i natriya vosstanovleniyem ikh sul'fatov zheleznymi struzhkami)

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957/(1958), Nr 5, pp 61-65

ABSTRACT: A method of producing K and Na by reduction of their (roasted) sulfates by fresh Fe filings (1 mm thick and 5-7 mm long) was tested under laboratory conditions. At 1000-1100°C and a residual pressure of 1-0.5 mm Hg, yields of 77-80% K and 93-95% Na are obtained after the reduction process is run for 2 hours with a 10-g specimen of sulfate (6 g of Fe filings being consumed for K production and 8 g for Na).

G.S.

1. Potassium--Production 2. Sodium--Production 3. Sulfates--Reducti
4. Iron--Applications

Card 1/1

5.2400(A)

30623

SOV/81-59-5-15977

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 327 (USSR)

AUTHORS: Mikulinskiy, A.S., Yakunchikov, V.N., Val'shechikov, V.I.,
Yafremkin, V.V.

TITLE: The Refining of Amorphous Boron by Oxidation Burning in a
"Fluidized Bed"

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957 (1958), Nr 5, pp 206-210

ABSTRACT: The possibility is investigated of refining amorphous boron (AB) by means of oxidation burning in a fluidized bed (FB). Weighed portions (4 - 36 g) of AB, containing 85% of total B and 11% Mg, were placed in a chamotte crucible and air was blown in through the bottom of the crucible with a rate of 20 - 35 l/min, at a temperature of 20 to 400°C, and a burning time of 30 - 95 minutes. When the reaction zone (RZ) of the furnace was heated up due to the hot air, a thermal gradient of 120 - 140°C was observed over the porous bottom and in the mass of the product, which brings

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SOV/81-59-5-15977

The Refining of Amorphous Boron by Oxidation Burning in a "Fluidized Bed"

about the ignition of the product. By installing a separate heater of the RZ, the self-ignition was eliminated. At a temperature of 540 - 560°C of the FB, the obtained product contained 94 - 95% of total B and 2.7 - 3.3% Mg. ✓

V. Shatskiy

Card 2/2

M. K. U. L. V. S. K. Y., A. S.

Abstracts from USSR. Metallurgical Institute Metallurgii

1974, Vol. 5 (Connections of the Institute of Metallurgy, Ural Branch, Academy of Sciences, USSR, No. 5) Leningrad, 1975. 377 p. Errors ally inserted. 1,000 copies printed.

Material Board: S.A. Veselin (Dep. M.), Candidate of Technical Sciences; A.S. Mikhailovskiy, Professor, Doctor; V.Ye. Kiler, Professor; P.A. Pashkov, Candidate of Technical Sciences; and S.G. Litvinchik, Candidate of Technical Sciences; M.A. Muravskiy.

15 **FRONT:** This book is intended for ferrous and nonferrous metallurgists.

16 **CONTENTS:** The book presents results of investigations of theoretical problems in metallurgy. It summarizes and gives information on the efficient use of raw materials in ferrous and nonferrous metallurgy and on the development of new problems in the metallurgical and chemical laboratories. The articles were written by leading members and experienced specialists of the scientific staff of the Institutes of Metallurgy, Chemistry, and Electrochemistry, Ural Branch Academies of Sciences, USSR.

17 **Articles:** S.V. Semyakova and B.M. Lopatin. Electrical Resistance and Phase Composition of Wrought Titanium During the Hot-Chambering Process

18 **Shalov, S.A., and Yu.A. Vetrov.** On the Connection Between the Kinetics of the Vaporization of Solids and the Pressure of Sublimated Vapor

19 **Shcherba, Z.I., and M.P. Dyer (Russian).** Behavior of Germanium During the Heating of Soluble Compounds

20 **Shcherba, Z.I., and M.I. Eshkov.** On the Reduction of the Lower Oxides of Silicon and Cobalt

21 **Shcherba, Z.I., and M.I. Eshkov.** Oxidation of the Lower Oxides of Silicon and Cobalt

22 **Shcherba, Z.I., and M.P. Dyer.** Polymerization of Methylacrylate-Carbon Sulfide in Vapor Solution

23 **Shcherba, Z.I., L.K. Gerasimov, and P.A. Pashkov.** Investigation of the Conditions for Electrodeposition of Copper from Nitric Solutions in the Presence of Iron, Zinc, and Cadmium Cations and the Nitrate Salt

24 **Prigodny, I.R., V.A. Pashkov, and L.K. Gerasimov.** Some Recommendations on the Electrolytic Production of Lead Springs from Aqueous Chloride Solutions and Selection of Suitable Anodes for Electrolysis

25 **Semenov, G.S.** Some Peculiarities of the Reaction of Melalite With Soda and Their Meaning for the Sintering Process

26 **Semenov, G.S., and S.I. Samoylov.** Optimum Conditions for Leaching Soda-Melalite Slimes

27 **Shchegolev, A.G., and G.R. Dombrovskiy.** Production of Metallic Sodium by Direct Reduction of the Sulfate or Carbonate (Expiratory Tests)

28 **Shchegolev, V.P., Ye.A. Vetrovskiy, A.A. Tikhonchik, and A.A. Babitskiy.** On the Problem of Passage of Zinc from Copper Matrix to the Gaseous Phase During Air Blast

29 **Shchegolev, V.P., S.A. Yegorovskiy, and M.P. Dyer (Russian).** Comparative Data on the Carrying of Liquid into the Gas-chamber Holes in an Experimental Converter

30 **Mikhaylov, V.V., B.M. Radinov, and V.I. Zhurkov.** On the Behavior of Oxides of Boron During the Metallurgical Treatment of Boron Crust

31 **Popelchik, A.V., and V.P. Chernobrovina.** On the Melting and Overheating of Pig Iron in the Cupola

32 **Popelchik, A.V., and V.P. Chernobrovina.** Change in Chemical Composition and Heat Content of Pig Iron During Cupola Melting

33 **Chernobrovina, V.P., A.A. Babitskiy, and V.M. Melnyuk.** Phosphorus and Titanium in Foundry Pig Iron

34 **Fillner, Yu.L.** On the Deposition of Ferritaceous Reguli

35 **Sharyy, A.G., and G.M. Spasuliy.** Investigation of the Copolymers of Poly-1,3-butadiene Glycol Dimethacrylate and Styrene

36 **Plotkina, M.I., and V.G. Plyusina.** Production of Isopropylacrylate by Alkylation of Isobutene With Olefins

37 **Teterin, G.M., O.A. Vozil, and B.M. Lopatin.** Investigation of the Kinetics of Pure and Alloys of Metals

MIKULINSKIY, A. S.

"On Constructing Continuous, High Productivity Vacuum Furnaces for
Production of the Alkaline and Alkali Earth Metals."

paper presented at Second Symposium on the Application of Vacuum Metallurgy.

Moscow, 1-5 July 1958

MIKULINSKIY, A.S.; KOZHEVNIKOV, G.N.

Preparation of metallic sodium by the reduction of its sulfate
or soda by carbon; research experiments. Trudy Inst. met. UFAN
SSSR no.77-80 '58. (MIRA 12:10)
(Metallurgical research) (Sodium)

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SOV/81-59-14-48955

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 14, pp 83 - 84 (USSR)

AUTHORS: Mikulinskiy, A.S., Maron, F.S.

TITLE: The Production of Compact Magnesium by the Vacuum-Thermal Method With the Production of Liquid Slags

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1958, Nr 7, pp 238-241

ABSTRACT: The authors studied the possibility of producing compact Mg metal from fragmentary materials by the silicothermal method with the formation of liquid slags. Comparative experiments on fragmentary and briquetted charges showed a slightly decreased yield of Mg metal for the fragmentary charge. It is assumed that the first stage of the process is the dissolution of MgO in liquid slag and the second the reduction of the dissolved MgO by ferrosilicon. The particle sizes affect the rate of the first stage, which is not limiting. The optimum conditions are a residual pressure equal to 0.5 - 2 mm Hg and a temperature of 1,520°C. In this case the Mg yield on working with a fragmentary charge amounted to 70 - 85%.

Card 1/1

I. Denisova

SOV/136-59-4-19/24

AUTHORS: Mikulinskiy, A.S., Professor, Doctor of Technical Sciences and Yefremkin, V.V., Candidate of Technical Sciences

TITLE: Reviews and Bibliography (Retsenzii i bibliografiya)

PERIODICAL: Tsvetnyye metally, 1959, Nr 4, pp 84-85 (USSR)

ABSTRACT: The following book is reviewed: V.A.Pazukhin and A.Ya.Fisher - "Vacuum in Metallurgy". (Metallurgizdat, 1956)

ASSOCIATION: UFAN

Card 1/1

PLANS I BOOK EXPLANATIONS 807/554

Absolutno mek 3000. Lemitsya po fiziko-khimicheskim osnovam proizvodstva stali
Primenenye vakuum v metallurgii (Use of Vacuum in Metallurgy) Moscow, Izdat-vo
SP 3000, 1960. 314 p. Errata slip inserted. 4,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii i zhelez A.S. Maykovo.
Lemitsya po fiziko-khimicheskim osnovam proizvodstva stali.
Beop. M.I. A.M. Smirnov. Corresponding Member, Academy of Sciences USSR; Ed. of
Publishing House: G.N. Makhrovich; Tech. Ed.: S.G. Markovich.

REMARKS: This collection of articles is intended for technical personnel interest-
ed in recent studies and developments of vacuum steelmaking practice and equip-
ment.

COVERAGE: The book contains information on steel melting in vacuum induction fur-
naces, and vacuum arc furnaces, reduction processes in vacuum, and degassing of
steel and alloys. The functioning of apparatus and equipment, especially, applied
vacuum furnaces and vacuum boosters, are described. The articles and illustrations are
illustrated in some instances. The articles and illustrations will appear in the table
of contents. These articles have been translated from English. Some of the

Index. J. (Soviet People's Republic). The Mechanism of Degassing of Molten
Steel in Vacuum 257

Kamenskaya, D.S., I.B. Filishchev, and V.I. Shatrovskiy. On the Problem of
Vacuum Melting of Metals 264

Elliot, B. Solubility of Nitrogen in Iron-Chromium-Nickel Melts 273

PART V. APPARATUS AND EQUIPMENT

Pagal, A.A. Levitation Melting of Metals in Vacuum or in the Inert-Gas
Atmosphere 279

Warner, E.H., and E.O. Danenow. Investigation of Individual Subassemblies
of Vacuum Electric Furnaces 290

Khizhinskiy, A.S., A.P. Solov'yev, and A.G. Polubnyakov. Highly Productive
Continuous Vacuum Furnaces 298

Iskritskiy, A.D. A New Series of Highly Productive Vapor-Stream Pumps
[G.G. Kamenskikhov and V.A. Kosarev participated in the work]

Dumskov, V.I. Highly Productive Mechanical Booster (Booster) Pumps 310
316

Maykov, V.S. Determination of Gas Content in Steel and Ferroalloys 320

Orlovich, Ye.B. Hot Rolling of Metals in Vacuum 326

AVAILABLE: Library of Congress

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Mikhailovskiy, A.S.

NAKHABIN, V.P., inzh.; MIKULINSKIY, A.S., doktor tekhn.nauk, prof.;
SHIRER, G.B., kand.tekhn.nauk; NEVSKIY, R.A., inzh.; SHOLOKHOV,
V.F., inzh.; YEFREMKIN, V.V., kand.tekhn.nauk; ZHUCHKOV, V.I.,
inzh.; KURNUSHKO, O.V., inzh.

Preparation of silicomanganese and ferromanganese from carbonate
ores of the "Polnochnoye" deposit. Stal' 20 no. 12:1099-1103
D '60. (MIRA 13:12)

1. Zavod ferrosplavov, Tsentral'nyy nauchno-issledovatel'skiy
institut chernoy metallurgii i Institut metallurgii Ural'skogo
filiala AN.

(Silicon-manganese alloys) (Ferromanganese)
(Polnochnoye region--Ore deposits)

PATRUSHEV, D.A.; MIKULINSKIY, A.S.

Mechanism of the process of phosphate reduction. *Zhur.prikl.khim.*
33 no.4:774-779 Ap '60. (MIRA 13:9)
(Phosphates)

s/080/60/033/04/14/045

AUTHORS: Mikulinskiy, A.S., Maron, F.S.TITLE: The Production of Calcium by the Dissociation of Calcium Carbide 21

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 835 - 841

TEXT: The possibility of obtaining calcium metal by the dissociation of calcium carbide according to the reaction: $\text{CaC}_2 \rightleftharpoons \text{Ca}_{\text{vap}} + 2\text{C}$ graphite was investigated. Calcium oxide, which is contained in commercial calcium carbide in the amount of 30%, can interact with carbon or carbide according to the reactions: $\text{CaO} + \text{C} \rightleftharpoons \text{Ca} + \text{CO}$, $2\text{CaO} + \text{CaC}_2 \rightleftharpoons 3\text{Ca} + 2\text{CO}$. The experiments were carried out with various types of commercial calcium carbide in an UMG-1 hermetic vacuum furnace. The absolute pressure was 0.5 - 1 mm Hg. Calcium metal was deposited in the form of a compact ring on the inner surface of the condenser. Calcium obtained from 83%-calcium carbide contained (%) 94.8 - 98.2 Ca, 0.0085 Fe, 0.009 Si, 0.012 Mg. After the reaction graphite with a carbon content of 94 - 98.5% remained in the residue. The optimum conditions of the reaction are a temperature of 1,770°C for 1 - 1.5 hours. The graphite obtained is considerably softer than pressed artificial graphite. Its ash content varies from 0.346 to 5.1%. For 1 t of calcium metal 2.7 t of 80%-CaC₂ is needed at a calcium yield of

Card 1/2

s/080/60/033/04/14/045

The Production of Calcium by the Dissociation of Calcium Carbide

75%. At the same time 0.7 t of graphite with a carbon content of 90 - 97% is obtained. The consumption of electric energy is 4,470 kw-h per 1 ton Ca. In the case of an efficiency factor of the furnace of 40%, the specific consumption is 11,850 kw-h/t. Experiments made in 1956 by B.A. Borok, M.I. Rodnoy, V.I. Gavrilin and B.P. Lobashov from TsNIIChERMET with a vacuum induction furnace of 50 kw have confirmed the possibility of obtaining calcium metal by the method mentioned. There are: 3 tables, 1 diagram and 13 references, 9 of which are Soviet, 2 German, 1 American and 1 Swiss.

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy khimicheskiy institut (Ural Scientific Research Chemical Institut)

SUBMITTED: September 2, 1959

Card 2/2

S/080/60/033/009/005/021
A003/A001

AUTHORS: Mikulinskiy, A.S., Selyanskiy, A.P.

TITLE: The Study of the Possibility of Increasing the Degree of Reducing Agent Consumption in the Silicothermal Method of Potassium Production ✓

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol. 33, No. 9, pp. 1981-1985

TEXT: Experiments were conducted to find the optimum ratio of reducing agent to potassium chloride in the silicothermal production of potassium. A special furnace was developed for determining the reaction rate. The weight increase in the metal obtained was used as indicator of the reaction rate. The reaction $4KCl + Si + 4CaO = 2CaCl_2 + 2CaOSiO_2 + 4K$ was studied by Gus'kov, Voynitskiy and Zuyev (Ref. 2). Chemically pure potassium chloride, commercial lime with 97% CaO and 75%-ferromanganese were used. The temperature was kept at 900-1,000°C. It was shown that the reduction of the molar ratio ferrosilicon ; potassium chloride in the charge permits the specific consumption of 75-% ferrosilicon to be decreased to 0.5-0.8 kg/kg potassium. At the same time the specific consumption of salt somewhat increases. For determining the optimum composition

Card 1/2

S/080/60/033/009/005/021
A003/A001

The Study of the Possibility of Increasing the Degree of Reducing Agent Consumption in the Silicothermal Method of Potassium Production

of the charge it is necessary to make allowance for local prices of raw material and electric energy. Under any conditions the molar ratio of Si;KCl is within the range of 0.3-0.5 and the weight ratio of 75%-ferrosilicon to potassium chloride within 0.15-0.25. There are 2 tables, 1 figure and 2 Soviet references.

SUBMITTED: February 13, 1960

Card 2/2

MIKULINSKIY, A S.

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PHASE I BOOK EXPLOITATION

SOV/5411

Konferentsiya po fiziko-khimicheskim osnovam proizvodstva stali. 5th, Moscow, 1959.

Fiziko-khimicheskiye osnovy proizvodstva stali; trudy konferentsii (Physicochemical Bases of Steel Making; Transactions of the Fifth Conference on the Physicochemical Bases of Steelmaking) Moscow, Metallurgizdat, 1961. 512 p. Errata slip inserted. 3,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova.

Responsible Ed.: A. M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: Ya. D. Rozentsveyg. Tech. Ed.: V. V. Mikhaylova.

Card 1/16

115

Physicochemical Bases of (Cont.)

SOV/5411

PURPOSE: This collection of articles is intended for engineers and technicians of metallurgical and machine-building plants, senior students of schools of higher education, staff members of design bureaus and planning institutes, and scientific research workers.

COVERAGE: The collection contains reports presented at the fifth annual convention devoted to the review of the physicochemical bases of the steelmaking process. These reports deal with problems of the mechanism and kinetics of reactions taking place in the molten metal in steelmaking furnaces. The following are also discussed: problems involved in the production of alloyed steel, the structure of the ingot, the mechanism of solidification, and the converter steelmaking process. The articles contain conclusions drawn from the results of experimental studies, and are accompanied by references of which most are Soviet.

Card 2/16

Physicochemical Bases of (Cont.)

SOV/5411

Mikulinskiy, A. S. , and V. A. Kosarev. Development of
the Design of a Vacuum Shaft-Type Furnace and Its Ele-
ments to be Used for Making Alkali Metals

502

AVAILABLE: Library of Congress

Card 16/16

VK/wrc/bc
10/3/61

S/137/62/000/003/040/191
A006/A101

AUTHORS: Mikulinskiy, A. S., Maron, F. S.

TITLE: Preparation of calcium by dissociation of calcium carbide

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 18, abstract 30117
(V sb. "Fiz.-khim. osnovy proiz-va stali", Moscow, AN SSSR, 1961,
199 - 205)

TEXT: The authors analyzed the possibility of obtaining cheaper Ca by dissociation of CaC_2 at higher temperatures according to equation $\text{CaC}_2 \rightleftharpoons \text{Ca (steam)} + 2\text{C (graphite)}$. It was established that by heating CaC_2 at 1,720 - 1,770°C and 0.5 - 1 mm Hg pressure, compact Ca metal can be obtained which contains 94.8 - 98.2% Ca and low-ash high-quality graphite (97% C). The yield of both products is 80 and 90% respectively. There are 12 references.

G. Svodtseva

[Abstracter's note: Complete translation]

Card 1/1

S/137/62/000/003/041/191
A006/A101

AUTHORS: Mikulinskiy, A. S., Kozhevnikov, G. N.

TITLE: Preparation of sodium metal by reduction of its sulfate or soda with carbon

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 18, abstract 30118 (V sb. "Fiz-khim. osnovy proizva. stali", Moscow, AN SSSR, 1961, 206 - 216)

TEXT: Na with a yield of 93 - 96% was obtained by reduction of soda with coke at 1,100°C and 1 - 2 mm Hg residual pressure in the retort. Reduction of Na₂SO₄ with coke at the same temperature and residual pressure in the retort without addition of CaO made it possible to obtain Na metal with a yield of 55 - 56%, and in case that CaO was added, with a yield of 92 - 94%. The possibility is also shown of obtaining K oxide by dissociation of its carbonate, at 0.5 - 1.0 mm Hg pressure and 900°C. There are 16 references.

G. Svodtseva

[Abstracter's note: Complete translation]

Card 1/1

18.7540

30894

S/180/61/000/005/004/018
E021/E180

AUTHORS: Mikulinskiy, A.S., and Frishberg, I.V. (Sverdlovsk)

TITLE: The possibility of obtaining liquid magnesium by condensation of a mixture of magnesium vapour and argon at atmospheric pressure

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo. no.5, 1961, 28-30 (+ 1 plate)

TEXT: Experiments were carried out using the apparatus shown in Fig.1. This consists of a sealed flask 5 with an external heating 3. The reaction tube 7 with ground-in lid 6 is placed inside. A crucible 4 with a 10g sample of metal is suspended from the lid. There are also two thermocouples 8 inside the reaction tube. The temperature in the hot zone can be controlled to ± 10 °C. The walls of the tube are cooled naturally and the temperature of the walls gradually decreases from the hot zone downwards. The length of the tube is 300 mm and the zone of evaporation 60 mm. The magnesium is preliminarily degassed at

Card 1/03

The possibility of obtaining liquid...
30894
S/180/61/000/005/004/018
E021/E180

400 °C in vacuo. Then purified argon is fed in and the temperature is allowed to increase. An appreciable amount of metal begins to evaporate as the melting point is approached. Atmospheric pressure is maintained. After holding for 2 hours at the required temperature, the heater is switched off and the tube is quickly cooled in air. The evaporating temperature, the variation in temperature along the tube, the diameter of the reaction tube and the size of the condensation surface were varied in the experiments. Results showed that a similar amount of metal was condensed at atmospheric pressure and 900-1000 °C as at 0.1-0.2 mm Hg and 475-550 °C. A decrease in length of the high temperature zone by a factor of 1.3 resulted in a decrease in yield of compact metal by a factor of 1.4. Thus the experiments indicated the possibility of obtaining compact magnesium by condensation from a mixture of magnesium vapour and argon at atmospheric pressure. There are 2 figures, 1 table and 7 references: 4 Soviet-bloc and 3 non-Soviet-bloc. The English language references read as follows:
Ref.2: F.E. Block, T.T. Campbell. Producing magnesium by silicothermic reduction. U.S. Bureau Mines Report
Card 2/0 3

30894

The possibility of obtaining liquid... S/180/61/000/005/004/018
E021/E180

Investigations, 1956, 5275.

Ref.3: J.J. Betcherman, L.M. Pidgeon. The physical nature of solid
condensates produced in the distillation of volatile metals.
Canad. Mining and Metallurg. Bull., 1951, 475, 44.

SUBMITTED: March 25, 1961

X

Card 3/ 3

MIKULINSKIY, A.S., doktor tekhn.nauk, prof.

Concerning the determination of parameters of electric ore-smelting
furnaces. Elektrichestvo no.6:33-38 Je '61. (MIRA 14:10)

1. Institut metallurgii Ural'skogo filiala AN SSSR.
(Smelting furnaces)

MIKULINSKIY, A.S.; YEFREMKIN, V.V.; ZHUCHKOV, V.I.; SHOLOKHOV, V.F.;
EPSHTEYN, N.Ye.

Obtaining manganese alloys from Polunochnoye deposit ores in
pilot plant thermal ore furnaces. Trudy Inst. met. UFAN SSSR no.7:
107-117 '61. (MIRA 16:6)

(Manganese alloys)

NAKHABIN, V.P.; MIKULINSKIY, A.S.; SHIRER, G.B.; NEVSKIY, R.A.; SHOLOKHOV,
V.F.; YEFREMKIN, V.V.; ZHUCHKOV, V.I.; KURNUSHKO, O.V.; EPSHTEYN,
N.Ye.; PANFILOV, S.A.; Prinimali uchastiye: IL'IN, V.M.; ZEMLYAKOV,
V.V.; SHMULEVICH, Ye.Ya.

Smelting out manganese-silicon and ferromanganese from Polunochnoye
deposit ores in a furnace with a power of 10,500 kilovolt-amperes.
Trudy Inst. met. UZAN SSSR no.7:127-145 '61. (MIRA 16:6)
(Manganese alloys) (Sintering)

MIKULINSKIY, A.S.; NAKHABIN, V.P.; SHIRER, G.B.; NEVSKIY, R.A.; STEBLYANKO,
N.V.; YEFREMKIN, V.V.; VOROB'YEV, V.P.; ZHUCHKOV, V.I.;
KURNUSHKO, O.V.

Change in the position of the electrodes and the capacity coefficient
in obtaining manganese alloys. Trudy Inst. met. UFAN SSSR no.7:
147-151 '61. (MIRA 16:6)

(Manganese alloys) (Sintering)

STEBLYANKO, N.V.; VOROB'YEV, V.P.; MIKULINSKIY, A.S.

Nature of the electric load in arc-type thermal ore furnaces.
Trudy Inst. met. UFAN SSSR no.7:153-156 '61. (MIRA 16:6)
(Electric furnaces)

ZHUCHKOV, V.I.; MIKULINSKIY, A.S.; YEFREMKIN, V.V.; MOLEVA, N.G.

Use of a fluxed sinter in obtaining carbon ferromanganese. Trudy
Inst. met. UPAN SSSR no.7:157-161 '61. (MIRA 16:6)
(Manganese alloys) (Sintering)

MIKULINSKIY, A.S.; ZHUCHKOV, V.I.; PANFILOV, S.A.; RYABCHIKOV, I.V.

Obtaining alloys of manganese and silicon. Trudy Inst. met. UFAN
SSSR no.7:163-175 '61. (MIRA 16:6)
(Manganese alloys) (Sintering)

MIKULINSKIY, A.S.; ZHUCHKOV, V.I.; VOROB'YEV, V.P.; SHOLOKHOV, V.F.

Obtaining manganese-silicon from Northern Ural ores. Trudy Inst.
met. UFAN SSSR no.7:177-181 '61. (MIRA 16:6)
(Manganese alloys) (Sintering)

S/020/61/140/003/020/020
B103/B101AUTHORS: Kozhevnikov, G. N., Mikulinskiy, A. S., and Bakhireva, L. D.

TITLE: Recovery of metallic sodium by reducing its hydroxide by carbon in vacuo

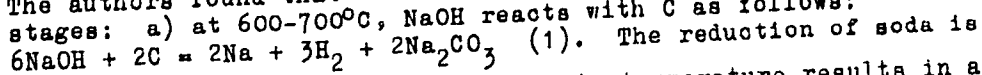
PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 3, 1961, 652-654

TEXT: Methods were studied to obtain a complete reduction of NaOH by carbon in vacuo. The demand for sodium hydride to remove scale from steel products is expected to increase. The resulting NaOH by-products should be utilized. In East Siberia, inexpensive NaOH will be recovered in the production of aluminum hydroxide from nephelite and syenite, owing to the low cost of electric power. Thus, the object of this study was the reduction of NaOH by C in vacuo. NaOH, previously melted at 400°C, was reacted with metallurgical coke (grain size 0.25 mm) in excess (20%) according to the equation $\text{NaOH} + \text{C} = \text{Na} + \text{CO} + 1/2 \text{H}_2$ (3). Preliminary tests showed that stirring of the charge does not affect the yield in metal. A non-briquetted charge (weighed portion of 15-30 g) was heated in a crucible of cr-3 (st-3) steel. The residual pressure and the yield of Na were measured. Card 1/3

Recovery of metallic sodium ...

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B103/B101

The authors found that the reduction of NaOH in vacuo proceeds in two stages: a) at 600-700°C, NaOH reacts with C as follows:



The reduction of soda is insignificant; b) a further increase in temperature results in an intensive interaction between soda and C: $\text{Na}_2\text{CO}_3 + 2\text{C} = 2\text{Na} + 3\text{CO}$ (4). For temperatures above 1000°C, the summational equation (3) holds (see above). Above 800°C, the yield in Na increases with rising temperature and attains a maximum at 1000°C. Duration of reaction 0.5-1.0 hr. A pressure increase from 1 to 5 mm Hg has merely a slight effect on the Na yield. On the other hand, the yield and quality of Na are considerably reduced at 10-15 mm Hg. This is attributed to oxidation of Na by CO. The purer the coke used, the lower the weight and alkali content of the residue. Therefore, the authors recommend very low-ash coke which, together with the determination of optimum quantities of initial substances, will facilitate the continuous production of Na. The yield in metallic Na was 97-98% as compared to 35-50% mentioned in the literature. There are 3 figures, 4 Soviet references and 3 non-Soviet references. The two references to English-language publications read as follows: W. Kroll, A. W. Schlechten, Trans. Electrochem. Soc., 23, 247, (1948); USA-Patent, No. 2,790,477, April 16, 1957.

Card 2/3

Recovery of metallic sodium ...

S/020/61/140/003/020/020
B103/B101

ASSOCIATION: Institut metallurgii Ural'skogo filiala Akademii nauk SSSR
(Institute of Metallurgy of the Ural Branch of the Academy
of Sciences USSR)

PRESENTED: April 4, 1961, by S. I. Vol'fkovich, Academician

SUBMITTED: April 4, 1961

Card 3/3

PHASE I BOOK EXPLOITATION

SOV/6354

Mikulinskiy, Aron Semenovich

Vakuumnyye elektricheskiye pechi dlya polucheniya shchelochnykh i shchelochnozemel'nykh metallov (Electric Vacuum Furnace for Producing Alkali and Alkali-Earth Metals). Moscow, Gosenergoizdat, 1962. 96 p. ("Biblioteka elektrotermista," vyp. 14) Errata slip inserted. 4500 copies printed.

Ed.: I. P. Brukovskiy; Tech. Ed.: N. I. Borunov; Ed. of Series: A. D. Svenchanskiy.

PURPOSE: This booklet is intended for scientific and engineering personnel interested in the design of electric vacuum furnaces. It may also be used as a textbook by students concerned with the problems outlined in the following paragraph.

COVERAGE: The booklet presents a systematic review of various designs of vacuum furnaces used for distillation and reduction of alkali and alkali-earth metals, such as potassium, sodium, lithium,

Card 1/4 ✓

Electric Vacuum Furnace (Cont.)

SOV/6354

magnesium, and calcium. Particular attention is devoted to designs of furnaces with high output and continuity of operations. Furnaces of such design may also be used in the production of ferrous and nonferrous metals. The technology of producing the above-mentioned metals is outlined to the extent necessary to understand and evaluate the design of furnaces and their components. The author thanks M. Ya. Smelyanskiy and I. P. Brukovskiy for their valuable comments. There are 115 references: 77 Soviet, 2 East German, 1 Rumanian, 26 American, 5 West German, 2 French, 1 Canadian, and 1 Swiss.

TABLE OF CONTENTS:

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Ch. I. Technology of Vacuum Distillation and Reduction of Metals	5
1. Principal methods for producing alkali and alkali-earth metals	5
Card 2/42	

YESIN, Oleg Alekseyevich; GEL'D, Pavel Vladimirovich; MIKULINSKIY, A.S.,
prof., doktor, retsenzent; BUR'KOV, M.M., red. izd-va; MATLYUK,
R.M., tekhn. red.

[Physical chemistry of pyrometallurgical processes] Fizicheskaya
khimiya pirometallurgicheskikh protsessov. Sverdlovsk, Metal-
lurgizdat. Pt.1. [Reactions between gaseous and solid phases]
Reaktsii mezhdu gazoobraznymi i tverdymi fazami. 2., ispr. i
dop. izd. 1962. 671 p. (MIRA 15:10)
(Metals at high temperature)
(Chemistry, Physical and theoretical)

SHCHEDROVITSKIY, Ya.S., kand.tekhn.nauk; MIKULINSKIY, A.S., doktor
tekhn.nauk, prof.

Concerning A.S. Mi'ulinskii's article "Determination of the
parameters of electric ore-smelting furnaces." Elektrichestvo
no.1:90-92 Ja '62.. (MIRA 14:12)
(Electric furnaces)
(Mikulinskii, A.S.)

S/133/62/000/004/005/008
A054/A127

AUTHORS: Mikulinskiy, A.S.; Vorob'yev, V.P.; Kotel'nikov, I.A.

TITLE: Tubular electrodes used in industrial-scale electric steel smelters

PERIODICAL: Stal', no. 4, 1962, 318 - 319

TEXT: The authors, together with G.M. Laletin, carried out tests with tubular electrodes to investigate the electric conditions of the furnace operation for different smelting periods, the duration of smelting, the total and reactive electric power consumption, the quantity of molten steel, electrode consumption, the external condition of the electrodes, (working end) after each smelting, the nature of cracks and the degree of oxidation of nipple-joints when these electrodes were used. Tubular electrodes, 400/80 mm were tested and compared to conventional 400-mm diameter electrodes, in 27 - 29-ton furnaces with a three-phase, 8,000 kw transformer. The furnace crown was made of dinas bricks, the walls of chrome-magnesite bricks and the bottom of magnesite. The transformer operated in five stages: 260, 229, 208, 150 and 118 v, the rated phase current on the up-side being 780 amp, that of the down-side 17.7 amp. The behavior of the electric arc when operating with conventional and tubular electrodes was determined by

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AC54/A127

Tubular electrodes used in ...

high-speed filming (900 - 1,000 frames per second) with an CKC-1M (SKS-1M) camera. The current intensity was recorded with a self-recording H-376 (N-376) ammeter. The following furnace operation parameters were obtained using tubular and conventional electrodes:

	Tubular electrode	Conventional electrode
Electrode consumption, kg/ton steel	6.98	6.31
Idem, with deduction of the burning losses	6.51	6.11
Electric power consumption, kwh/ton steel	718	708
Average periodicity of electrode build-up, heats/electrode	4.1	4.4
Furnace runs (calculated by the crown condi- tion) smelts	92	85
Average number of cut-offs of the oil switch per heat	2.2	3.1
Power coefficient per heat, $\cos \varphi$	0.831	0.827

The tests did not reveal any economic effect of using tubular electrodes; they have certain advantages, however. Tubular electrodes, as compared to conventional ones, are capable of focusing the electric arc below the operating end; the per-

Card 2/3

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A054/A127

Tubular electrodes used in

iodical flashes of the arc of tubular electrodes are less intensive and less concentrated and, therefore, they are less harmful to the furnace lining. The current load per phase is more stable, and depending on the phase conditions of the furnace, increases by an average of 20 - 30%. This can be explained by the arc burning conditions being improved, due to factors affecting the arc-discharge stability, which, as time progresses, shows less change than when using conventional electrodes. The number of automatic cut-outs of the oil switch is reduced by 30%, on account of a stable current load of the transformer rendered possible by a physical contact between the electrode and the charge. In view of the results, tubular electrodes are most expediently used in smelting carbon-free ferrochrome in refining furnaces. They are expected to contribute to a prolonged service life of the furnace lining and due to their electric load stabilizing effect they will make possible higher voltages in electric steel smelters and ore-smelters. There are 3 figures.

Card 3/3

MIKULINSKIY, A.S.; RYABCHIKOV, I.V.

Making calcium and magnesium alloys with silicon. Izv.vys.ucheb.
zav.; chern.met. 5 no.62/4-51 '62. (MIRA 15:7)

1. Institut metallurgii Ural'skogo filiala AN SSSR.
(Silicon-iron-magnesium alloys--Electrometallurgy)
(Calcium silicide) (Magnesium silicide)

MIKULINSKIY, A.S.; VOROB'YEV, V.P.; KOTEL'NIKOV, I.A.; Prinsipal
uchastiye LALETIN, G.M.

Use of tubular electrodes in industrial electric furnaces for
steel smelting. Stal' 22 no.4:318-219 Ap '62. (MIRA 15:5)
(Steel--Electrometallurgy) (Electric furnaces)

43815

S/020/62/147/004/025/027
B101/B186

11.1520

AUTHORS: Frishberg, I.V., Mikulinskiy, A.S.

TITLE: Variation in the mass transfer coefficient for magnesium vapor condensation from a mixture with helium

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 4, 1962, 886-888

TEXT: The condensation of magnesium vapor mixed with helium was determined at atmospheric pressure and at a flow rate of 1 cm/sec. Details of the method used for the purpose will be described in a paper that is now being printed. In the first series of experiments, the concentration of magnesium in the vapor and on the condenser surface was altered by varying the temperature of condensation. In the second series, only the surface temperature of the condenser was varied, the initial partial pressure of the magnesium being kept constant. The mass transfer coefficient was calculated from $q = (\alpha p / RT_c) \ln[(p - p_c)/(p - p_i)]$, where $\alpha = D/\delta$ cm/sec; D = diffusion coefficient, cm^2/sec ; δ = thickness of the diffusion layer. The second series showed α to be a linear function of T_c . The results of the first series indicate that α probably depends

Card 1/2

Variation in the mass transfer ...

S/020/62/147/004/025/027
B101/B186

exponentially on Δp . Hence $\log \alpha = 1.1537 - 0.331 \cdot 10^3 / T_c$, wherefrom δ is obtained as $p^{-0.08}$. There are 2 figures and 1 table. The English-language reference is: R.S. Cvetanvic, D.I. Le Roy, J.Chem.Phys., 20, 343 (1952).

ASSOCIATION: Institut metallurgii Ural'skogo filiala Akademii nauk SSSR
(Institute of Metallurgy of the Ural Branch of the Academy of Sciences USSR)

PRESENTED: July 16, 1962, by S.I. Vol'fkovich, Academician

SUBMITTED: July 12, 1962

Card 2/2

S/149/63/000/001/003/008
A006/A101

AUTHORS: Ryabonikov, I. V., Mikulinskiy, A. S.

TITLE: Measuring the pressure of magnesium vapors over solid magnesium,
and Mg-Si and Mg-Ca-Si alloysPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya,
no. 1, 1963, 95 - 99

TEXT: To complete and make more precise foreign and Soviet experimental data, the authors investigated Mg vapor pressure over the aforementioned materials using the Knudsen effusion method. Mg-vapor pressure was measured over magnesium, refined in a vacuum in a 685 - 791°K range. The following standard value for the enthalpy of Mg sublimation was found: $\Delta H_{298}^{\text{subl}} = 35.100 \text{ kcal/g}\cdot\text{atom}$.

Si-Mg alloys with 71.8, 64.1 and 6.33 at% Mg were investigated. It was found that an alloy with 64.1 at% Mg is characteristic of the thermochemical properties of Mg silicide. Vapor pressure over this alloy in the 845 - 953°K varies with temperature according to equation $\lg p = -\frac{9.700}{T} + 6.380$ (3). The presence

Card 1/2

Measuring the pressure of...

S/149/63/000/001/003/008
A006/A101

of Ca in the alloys has practically no effect upon the pressure of Mg vapor over alloys containing approximately equal amounts of Mg. On the basis of data on Mg vapor tension over pure metal and Mg silicide, the temperature dependence of changes in the isobar-isothermic potential can be found for the formation of magnesium silicide from the elements. It follows from equation $\Delta F_T^0 = -20.1 + 5.5 T$ (7) that for the investigated temperature range standard enthalpy and entropy values of Mg silicide formation are respectively 20.0 kcal/mole and 5.24 cal/mole-degree. Standard entropy of Mg_2Si is 14.80 cal/mole-degree. This article was recommended for publication by the Kafedra metallurgii legkikh metallov Ural'skogo politekhnicheskogo instituta (Department of Light-Metal Metallurgy at the Ural Polytechnic Institute). There are 4 figures.

ASSOCIATION: Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii i UFAN SSSR (Chelyabinsk Scientific Research Institute of Metallurgy and UFAN USSR)

SUBMITTED: May 4, 1962

Card 2/2

RYABCHIKOV, I.V.; MIKULINSKIY, A.S.

Conditions for the reduction of magnesium oxide by silicon during
the smelting of magnesium addition alloys. Izv. AN SSSR. Otd. tekhn.
nauk. Met. 1 gor. delo no.2:9-12 Mr-Ap '63. (MIRA 16:10)

L 15653-63

BWP(q)/BWT(m)/BDS AETC/ASD JD

ACCESSION NR: AF3000847

S/0286/63/000/002/0032/0032

AUTHOR: Mikulinskiy, A. S., Ioffe, V. S., Englin, A. L. 55

TITLE: Method of obtaining metallic calcium, Class C 22d, 40c, 15. No. 152740

SOURCE: Byul. izobreteniy i tovarnykh znakov, no. 2, 1963, 32

TOPIC TAGS: metallic calcium, electrolysis, liquid metallic cathode, distillation

ABSTRACT: Method of obtaining metallic calcium, by electrolysis on liquid metallic cathode with distillation; its distinguishing feature is that in order to obtain a product of high purity, the melt is subjected to distillation as the calcium accumulates, leaving a part of the calcium and returning the residue to the bath. No graphics. [Abstracter's note: complete translation]

ASSOCIATION: none

SUBMITTED: 12Dec46

SUB CODE: GE

DATE ACQ: 28May63

NO REF SOV: 000

ENCL: 00

OTHER: 000

Card 1/1

FRISHBERG, I.V.; MIKULINSKIY, A.S.

Prospects for developing the silicothermal method of magnesium production. Izv. Sib. otd. AN SSSR no.2:63-66 '62.

(MIRA 16:10)

1. Ural'skiy filial AN SSSR, Sverdlovsk.

MIKULINSKIY, A.S.; KOZHEVNIKOV, G.N.; BAKHIREVA, L.D.; VULIKH, A.I.

Vacuum-thermal separation of cesium and potassium fluorides. Izv.
SO AN SSSR no.7 Ser.khim.nauk no.2:105-107 '63. (MIRA 16:10)

1. Ural'skiy filial AN SSSR, Sverdlovsk.

MOLEVA, N.G.; ZHUCHKOV, V.I.; MIKULINSKIY, A.S.; KUSAKIN, P.S.; YEFREMKIN, V.V.

Change in the phase composition of materials in relation to the
height of the thermal ore furnace in obtaining manganese sinter.

Trudy Inst. met. UFAN SSSR no.7:119-125 '61.

(MIRA 16:6)

(Sintering) (Manganese ores)

FRISHBERG, I.V.; MIKULINSKIY, A.S.; VETRENKO, Ye.A.

Device for measuring the quantity of a condensing substance.
Zav. lab. 29 no.9:1143-1144 '63. (MIRA 17:1)

1. Institut metallurgii Ural'skogo filiala AN SSSR.

FRISHBERG, I.V.; MIKULINSKIY, A.S.

Study of the kinetics of magnesium vapor condensation and the design of a condenser with variable temperature. Zhur. prikl. khim. 36 no.5:949-953 My '63. (MIRA 16:8)

(Magnesium) (Condensers (Vapor and gases))

POLUBOYARTSEV, A.G.; MIKULINSKIY, A.S.

Mechanism and technology of the thermal reduction of potassium
chloride. Zhur. prikl. khim. 36 no.12:2610-2619 D'63.
(MIRA 17:2)

ZHUCHKOV, V. I.; SUCHIL'NIKOV, S. I.; MIKULINSKIY, A. S.; MOLEVA,
N. G.

Electric resistance of ore and lime mixtures used in the
manufacture of metallic chromium. *Izv. vys. ucheb. zav.; Chern.
met.*, 7 no. 4:62-67 '64. (MIRA 17:5)

1. Ural'skiy politekhnicheskii institut.

ASTAF'YEVA, M.N.; VETRENKO, Ye.A.; MIKULINSKIY, A.S.; FRISHBERG, I.V.

Rossmen-Yarwood's formula for calculating the coefficient
of condensation. Zhur. fiz. khim. 38 no.2:523-525 P 6.
(MIRA 17:8)

J. Institut metallurgii Ural'skogo filiala AN SSSR.

MIKOLINSKIY, Aron Gamenovich; BRUKOVSKIY, I.P., red.

[Determination of the parameters of ore-smelting furnaces using the similitude theory] Opredelenie parametrov rudnotermicheskikh pechei na osnove teorii podobija. Moskva, Energiia, 1964. 85 p. (Biblioteka elektrotermista, no.20) (NIRS 1811)

L 59626-65	EWI(m)/EPF(n)-2/EWP(t)/EAP(b)	Pu-4	IJP(c)	JD/JM/JG
ACCESSION NR:	AT5015892	UR/2975/64/000/010/0138/0143		
AUTHOR:	Kozhevnikov, G. N.; Mikulinskiy, A. S.			
TITLE:	Production of <u>alkali-metal oxides</u>			31 B+1
SOURCE:	AN SSSR, Ural'skiy filial. Institut metallurgii. Trudy, no. 10, 1964. Protsessy rudnoy elektrotermii (Processes of mining electrothermics), 138-143			
TOPIC TAGS:	alkali metal, chemical decomposition, thermochemistry, oxide, aluminate, hydroxide			
ABSTRACT:	A thermal method, based on the decomposition of alkali metal carbonates, aluminates and hydroxides, was studied. The dissociation processes of the above compounds were analyzed both chemically and thermodynamically. Experiments were done to test the feasibility of the processes, and data were collected for the percentage output as a function of temperature. The compounds were placed in crucibles and heated to various temperatures; the resulting products were analyzed for oxide content. The carbonates did not give a high enough yield to be considered for processing either Na ₂ O or K ₂ O. However, these oxides could be usefully produced by dissociation of aluminates at 1100-1350°C and at pressures of 0.05-2.5 mm Hg, for a			
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ACCESSION NR: AT5015892

40-45% yield. The chemical reaction for this process was presented as $Me_2CO_3 + Al_2O_3 = Me_2O \cdot Al_2O_3 + CO_2$ for temperatures in the 1100-1300°C range, and at atmospheric pressure, in order to eliminate the carbon dioxide gas; after this the aluminate was allowed to dissociate in a vacuum of 0.05-1 mm Hg at 1300-1400°C, according to the reaction $Me_2O \cdot Al_2O_3 = Me_2O + Al_2O_3$. It was also established that for 500-700°C and residual pressures of 2-10 mm Hg, lithium hydroxide could be dehydrated and a yield of 85-91% Li_2O obtained. When the temperature is reduced to 1000-1200°C, dehydrogenation of lithium hydroxide takes place at atmospheric pressure in the form of thin layers, leaving behind a surface of the residual lithium oxide. Orig. art. has: 4 tables. 0

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, GC

NO REF SOV: 007

OTHER: 008

Jm
Card 2/2

L 52056-65 EWP(m)/EWP(t)/EWP(b) IJP(e) JD/JG	
ACCESSION NR: AR5008963	S/0137/65/000/001/G020/G020
SOURCE: Ref. zh. Metallurgiya, Abs. 1G118	26 B
AUTHOR: Mikulinskiy, A. S.; Kosarev, V. A.; Yumanova, L. V.; Sipayko, I. Ye.; Selyanskiy, A. P.; Panfilov, S. A.; Poluboyarshev, A. G.	
TITLE: Semi-industrial furnace for the extraction of alkaline metals by the thermal vacuum method	
CITED SOURCE: Elektrotermiya. Nauchno-tekhn. sb., vyp. 37, 1964, 28-30	
TOPIC TAGS: metallurgy, alkali metal, potassium	
TRANSLATION: The article describes the design and testing results of a semi-industrial rotary vacuum furnace. The device has internal and external heaters for heating the charge, which permits an increase in the productivity of the furnace. The unit also has built-in devices for loading materials and unloading reaction residues, which provides semi-continuous operation of the furnace. The working volume of the furnace is 15 m ³ , the volume of working space of the retort is 1.8 m ³ . The design developed provides conditions for extraction of metallic potassium by the carbide thermal method.	
Card 1/2	

12056-45				
ACCESSION NR:	AR5006963			0
SUB CODE:	MM	ENCL:	00	
<i>ml</i> Card 2/2				

MIKULINSKIY, A.S.; RYSS, M.A.; RUSAKOV, L.N.

Role of silicon carbide and the rotation of the furnace bath in
making silicon and its alloys. Stal' 24 no.7:620-623 J1 '64.
(MIRA 18:1)

L 63556-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JW

ACCESSION NR: AT5015891

UR/2975/64/000/010/0129/0137

AUTHOR: Mikulinskiy, A. S.; Kozhevnikov, G. N.

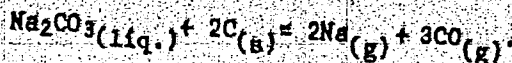
22
21
B1

TITLE: Production of metallic sodium in a vacuum electric furnace

SOURCE: AN SSSR, Ural'skiy filial, Institut metallurgii. Trudy, no. 10, 1964. Protssasy rudnoy elektrotermii (Processes of mining electrothermics), 129-137

TOPIC TAGS: sodium, metal purification

ABSTRACT: The reduction of sodium carbonate by carbon in a vacuum electric furnace was studied to develop economic sodium extraction methods. Three general categories were considered: (1) the theoretical prerequisites for the reduction process (including a thermodynamic analysis of the Na-C-O, Na-O, and Na-C systems); (2) a general discussion of the furnace construction; and (3) the results of actual laboratory scale production. In the first part, free energy data was combined with the equilibrium constant for the reaction,



The result gave the log of the partial pressure of Na as a function of temperature.

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L 63556-65

ACCESSION NR: AT5015891

This equation was plotted and used to determine the equilibrium phase of Na at the furnace temperatures. The stability of Na_2O , and the interaction of Na with carbonaceous materials was also analyzed. Previous x-ray studies (Boydilo, M. K., Trudy Kirgizskogo sel'skokhozyaystvennogo instituta, Frunze, Vyp. 10, No. 3, 1957, 203) on the Na-C system are tabulated, showing the effect of Na on the lattice parameter of graphite. In the second part, the principal aim was a more efficient design for the vacuum furnace. A cross-sectional figure is given which outlines the important details, along with a textual explanation. The final experimental portion summarizes the actual use of the furnace in the production of Na, including procedures for charge preparation, and the experimental results. Appropriate transformer settings and heating schedules are given; in general, the heating time is 3.5-4 hrs, and the pressure after initial heating falls from 5 to 1 mm of Hg. The Na vapor was condensed and a compact mass of metal was produced. The authors conclude that further work is necessary in order to establish optimum electrical conditions for production. Orig. art. has: 2 figures, 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, GC

NO REF SOV: 011

OTHER: 011

Card 2/2

NAKHABIN, V.P.; SHOLOKHOV, V.F.; NEVSKIY, R.A : MIKULINSKIY, A.S.;
ZHUCHKOV, V.I.; EPSHTEYN, N.Ye.; VOROL'YEV, V.P.

Using semicoke as a type of reducing agent in the production of
silicon-chromium and carbon ferrochromium. Stal' 24 no.11:1006-
1008 N '64. (MIRA 18:1)

LEUCHNEV, V.I.; VOROB'YEV, V.P.; MIKULINSKIY, A.S.

Simultaneous measurement of temperature, electrical resistance of the charge, and position of electrodes as a method for studying the operation of charge-resistance furnaces. Izv. vys. ucheb. zav.; Chern. met. 8 no.2:73 '65. (MIRA 18:2)

I. Sverdlovskiy metallurgicheskii institut.

L 51841-65 ENT(m)/EWP(t)/EWP(b) IJF(c) JD/JW/JG

ACCESSION NR: AP5011808

UR/0080/65/038/004/0713/0717
661.32

AUTHOR: Kozhevnikov, G. N.; Mikulinskiy, A. S.; Bakhireva, L. D. 18

TITLE: Preparation of metallic sodium by reduction of its silicate with carbon in a vacuum 21

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 4, 1965, 713-717

TOPIC TAGS: sodium, silicate, reduction, carbon

ABSTRACT: On the basis of a thermodynamic calculation and experimental data, it is shown that sodium metal can be obtained by reducing its silicate with carbon. The reaction $(Na_2SiO_3 + C + 2CaO \rightarrow 2Na + 2CaOSiO_2 + CO)$, carried out at 1100-1200°C at a residual pressure of 0.2-5 mm Hg in the presence of line, produces a 88-95% yield of sodium. In order to obtain high yields of sodium, the amount of CaO added to the initial mixture should correspond to the optimum molar ratio $CaO:SiO_2 = 2$. Without the addition of CaO, the sodium yield is only 20-25%. A study of the yield of sodium as a function of the reducing agent (for a 1-hr reaction at 1100°C) showed that the optimum amount of carbon (100 mesh) is twice as much as the theoretical 14

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ACCESSION NR: AP5011808

amount. The stoichiometric amount is insufficient because reduction takes place between solid phases, and the starting reagents become separated from one another by the reaction products as the process continues. On the other hand, a large excess of carbon (12-fold or greater) decreases the yield of sodium. As the duration of the reaction is increased to 3 hr, the yield rises from 68 to 95%. Orig. art. has: 4 figures, 1 table, and 3 formulas.

ASSOCIATION: none

SUBMITTED: 09Feb62

INCL: 00

SUB CODE: GC, MM

NO REF SOV: 009

OTHER: 003

Card 2/2

ACC NR: AT7004208

SOURCE CODE: UR/0000/66/000/000/0069/0073

AUTHORS: Mikulinskiy, A. S.; Frishberg, I. V.

ORG: none

TITLE: Investigation of condensation of magnesium vapors from a mixture of magnesium vapor and helium gas

SOURCE: AN SSSR. Institut metallurgii. Eksperimental'naya tekhnika i metody vysokotemperaturnykh izmereniy (Experimental techniques and methods of high temperature measurement). Moscow, Izd-vo Nauka, 1966, 69-73

TOPIC TAGS: magnesium, helium, metal vapor deposition

ABSTRACT: An apparatus for determining the mass transfer coefficient during metal vapor condensation from a mixture of metal vapor and permanent gas was developed. A schematic of the apparatus is presented (see Fig. 1). This apparatus was used for determining the rate of condensation of magnesium vapors from a helium-magnesium vapor mixture. The experimental results are shown graphically. It was found that the condensation rate obeyed the Stephan-Maxwell law. Ye. A. Vetrenko participated in

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ACC NR: AT7004208

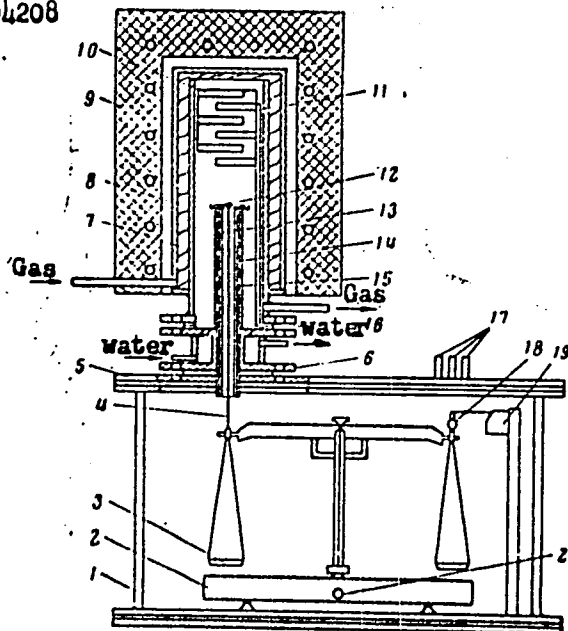


Fig. 1. Apparatus for determining the mass of condensed substance.

- 1 - balance case; 2 - balance;
- 3 - counterweight; 4 - steel shaft;
- 5 - upper removable hood; 6 - lower flange of reaction vessel;
- 7 - reaction vessel; 8 - steel screen;
- 9 - furnace; 10 - evaporator;
- 11 - steel shield; 12 - condensation surface;
- 13 - inlet pipes; 14 - steel cylinder;
- 15 - steel bushing; 16 - thermocouple;
- 17 - outlets for vacuum pump, gas and measuring devices;
- 18 - damping cup; 19 - magnetic damper;
- 20 - arrest

the investigation. Orig. art. has: 3 graphs and 1 equation.

SUB CODE: 11/

SUBM DATE: none/

ORIG REF: 003/

OTH REF: 001

Card 2/2

ZHUCHKOV, V.I. (Sverdlovsk); LEPINSKIKH, B.M. (Sverdlovsk); MIKULINSKIY, A.S.
(Sverdlovsk); Principal associate: ZAKHAROV, V.N.

Electric conductivity and thermoelectromotive force of solid
manganese oxides at high temperatures. Izv. AN SSSR. Mat.
no.4:46-50 JL-Ag '65. (MIRA 18:8)

MIKULINSKIY, G. V.

Primenenie tokov vysokoi chastoty dlia zashchity linii elektropredachi / Use of high frequency currents for protecting electric transmission lines / Moskva, Gosenergoizdat, 1953. 8 p.

SO: Monthly List of Russian Accessions, Vol 7 No 2 May 1954.

MIKULINSKIY, I.M. (Chelyabinsk)

Organization of tuberculosis control in industrial enterprises.
Probl.tub. no.3:3-7 My-Je '55. (MLRA 8:8)
(TUBERCULOSIS, PULMONARY, prevention and control,
in Russia, in indust.)
(INDUSTRIAL HYGIENE,
antituberculosis serv. in Russia)

MEKULINSKIY, I.M.

Occupational rehabilitation of tuberculosis patients at the
Chelyabinsk Electrometallurgic Combine. Probl. tob. 42
no.8:17-20 '64. (MIRA 18:12)

1. Chelyabinskiy gorodskoy protivotuberkuleznyy dispanser
(glavnyy vrach N.P.Bohdyreva).

MIKULINSKIY, I.N. (Chelyabinsk)

Are district public health departments necessary in cities.
Sovet. zdravookhr. 5:49-52 '63 (MIRA 17:2)

L 41011-65 EWT(m) Peb DIAAP

ACCESSION NR: AP5007703

S/O: 67/65/001/001/0038/0045

AUTHOR: Bunatyan, G. G.; Mikulinskiy, M. A.TITLE: Isotopic shifts and quadrupole moments of close-to-spherical nuclei

SOURCE: Yadernaya fizika, v. 1, no. 1, 1965, 38-45

TOPIC TAGS: isotopic shift, quadrupole moment, near spherical nucleus, electron energy level, Fermi system

ABSTRACT: The isotopic shift of electron energy levels and the quadrupole moments of nuclei in the vicinity of spherical nuclei have been calculated on the basis of the theory of finite Fermi systems developed earlier by A. B. Migdal (see e.g., ZhETF, 46, 1680, 1964; A. B. Migdal, A. I. Larkin, ZhETF, 45, 1036, 1963). An analysis of the phenomena led to the conclusion that it is necessary to introduce an interaction amplitude which changes its sign and magnitude at the surface of the nucleus. The values of the internal and external constants of the theory have been also determined. Table 1 of the Enclosure presents the constant C of isotopic shifts

$$C = \frac{R_0}{3} \left(\frac{1+\sigma}{\Gamma(1+2\sigma)} \right)^2 \left(\frac{2ZR}{a_H} \right)^{2\sigma} \frac{\langle r^2 \rangle}{R^2}$$

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ACCESSION NR: AP5007703

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where R_{∞} = Rydberg constant, a_0 = radius of first Bohr orbit, $z = \sqrt{1 - z^2/137^2}$,

Z = atomic number, and R = nuclear radius. Table 2 of the Enclosure presents the nuclear quadrupole moments. "The quadrupole moments for the light O_{17} and K_{39} nuclei were calculated by V. A. Belyakov and S. V. Khudvakov. The authors thank A. B. Migdal, V. A. Belyakov, M. A. Troitskiy and A. R. Striganov for constant help during computer

calculations." Orig. art. has: 21 formulas and 2 tables.

ASSOCIATION: None

SUBMITTED: 20Jul64

NO REF SOV: 008

ENCL: 02

SUB CODE: NP

OTHER: 007

Card 2/5

8630 3

3.9300
9.9865

S/150/60/000/011/001/002
B012/B067

AUTHORS: Mikulinskiy, M. A., Engineer, Mironov, P. S., Engineer

TITLE: Determination of the Stress Tensor in an Explosion From Data of Experimental Seismic Studies

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy Gornyy zhurnal, 1960, No. 11, pp. 69-72

TEXT: A method is given for calculating the stress tensor from data of seismic observations. To use the conditions of O. Mohr (Ref. 1), the three components of the stress tensor and the total stress tensor must be known. Formulas are derived for an infinite homogeneous, isotropic medium. First the Lamé constants λ and μ are determined from the formulas (Ref. 3):

$$\mu = \frac{\rho c_t^2}{g}, \quad \lambda = \frac{\rho}{g} (c_l^2 - 2c_t^2),$$
 where c_l and c_t denote the velocity of the longitudinal and transverse waves, respectively, ρ the density of the rock investigated, and g - the gravitational acceleration. The components of the matrix

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Determination of the Stress Tensor in an
Explosion From Data of Experimental
Seismic Studies

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B012/B067

$$\begin{pmatrix} \frac{\partial A_x}{\partial x} & \frac{\partial A_y}{\partial x} & \frac{\partial A_z}{\partial x} \\ \frac{\partial A_x}{\partial y} & \frac{\partial A_y}{\partial y} & \frac{\partial A_z}{\partial y} \\ \frac{\partial A_x}{\partial z} & \frac{\partial A_y}{\partial z} & \frac{\partial A_z}{\partial z} \end{pmatrix}$$

are then determined from the formula

$$\frac{\partial A_i}{\partial x_j} = - \left(\frac{A_i}{r} + \frac{v_i}{c_i} \right) \frac{x_j}{r}$$

with the velocity vector \vec{v} and the displacement vector \vec{A} being known from the oscillogram 1 and j may be 1, 2, and 3. v is the oscillation velocity of the ground particles. The deformation tensor ϵ_{ij} and the vector $\vec{\omega}_i$ can be determined from the quantities

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✖

Determination of the Stress Tensor in an
Explosion From Data of Experimental
Seismic Studies

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B012/B067

$\frac{\partial A_i}{\partial x_j}$. Since λ , μ , and ϵ_{ij} are known, the components of the stress tensor can be determined. At large distances, the stress tensor can be obtained from simpler formulas. When the stress tensor has been determined, the stability of the respective structure or massif can be estimated on the basis of Mohr's stability conditions. The publication of this article was recommended by the kafedra gornykh mashin i rudnichnogo transporta SGI (Department of Mining Machines and Mining Transportation of the SGI). There are 1 figure and 5 references: 4 Soviet and 1 German

ASSOCIATION: Institut Unipromed' (Unipromed' Institute)

SUBMITTED: June 27, 1960

LH

Card 3/3