DYUBIN, N.P.; DYUBINA, A.V.; SVIRIDENKO, F.F.; KARPUNIN, A.M.; Prinimali uchastiye: LEVCHENKO, N.D.; POPOVA, N.N.; TROFIMOV, V.V.; SHUBENKO, G.L.; CHETVERIKOV, A.V.; RYABININ, N.G.; ZEMLYANSKAYA, L.I.; FRADINA, M.G.; ORGIYAN, V.S.; SABUTSKIY, F.M.; MOMGELI, A.V.; BUL'SKIY, M.T.; FRADIN, M.D.; VALENKO, N.S.; KUCHERYAVYY, Yu.P.; CHEPELEV, P.M.; SABUROV, T.A.; POLYAKOV, P.M.; MALASHENKO, R.B.

Effect of the temperature of rail rolling on their quality. Sbor. trud. UNIIM no.11:344-353 '65. (MIRA 18:11)

GERSHGORN, M.A.; SVIRIDENKO, F.F.; KAZARNOVSKIY, D.S.; KRAVTSOVA, I.P.; POPOVA, A.N.; FRADINA, M.G.; Prinimali uchastiye: LUKASHOV, G.G.; RUDOL'SKIY, N.L.; SLEPKANEV, N.P.; PLISKANOVSKIY, S.T.; GORBANEV, Ya.S.; BUL'SKIY, M.T. [deceased]; ARKHANGEL'SKIY, Yu.N.; SHAROV, B.A.; VISTOROVSKIY, N.T.; RAKHANSKIY, B.I.; SAPOZHKOV, V.Ye.; RYABININ, N.G.; KARAKULINA, R.R.; FADEYEVA, A.M.; ZVEREV, D.A.

Improving the production of high-strength rails by alloying them with granulated ferrochromium in the ladle. Stal' 25 no.5:408-411 My '65. (MIRA 18:6)

1. Ukrainskiy nauchno-issledovatel'skiy institut metallov i zavod "Azovstal'".

[redacted], N. P.

Rybin'in, N. P. - "On some problems of the inter-action of the caterpillar with the soil," Trudy Azov.-Chernomor. In-ta mekhanizatsiya sel. Khoz-va, Issue 6, 1948, p. 81-[illegible] - Bibliography: 6 items.

SO: U-3350, 16 June 53, (Letopis 'Zhurnal 'nykh Statey, No. 5, 1949).

KHOLODENKO, E.B.; RYABININ, O.P.

Semiautomatic machine for assembling a check ring with ball bearings. Avt. prom. 30 no.10:37 O '64. (MIRA 17:11)

1. Gor'kovskiy avtomobil'nyy zavod.

RYABININ, P.

AID P - 3147

Subject : USSR/Miscellaneous

Card 1/1 Pub. 135 - 9/20

Author : Ryabinin, P., Lt. Col. of the Tech. Serv.

Title : Periscope for training pilots in aircraft gunnery

Periodical : Vest. vozd. flota, 10, 51-52, O 1955

Abstract : The use of a periscope for direct observation of the action of the pilot or a gunner in flight is suggested by the author. The periscope adapted for aircraft of the type UTI-MIG-15 is described and its diagram given.

Institution : None

Submitted : No date

BEGIZOV, A.D.; RYABININ, P.I.

Filmstrips and motion pictures. Meteor. i gidrol. no.6:40 Je '56.
(Motion pictures in meteorology) (MLRA 9:9)

ASHRAF'YAN, M.O.; RYABOKON', S.A.

Comparative indices of the of the rotary- and turbo-drilling methods using standard two- and three-sectional turbobits. Neft. khoz. 38 no.12:18-21 D '60. (MIRA 14:4)
(Oil well drilling) (Turbodrills)

KISAROV, V.M.; KOLMAKOV, O.A.; RYABININ, S.I.; Prinimala uchastiye YEMEL'YANOVA, G.A.

Recovery of benzene from absorption gases by means of by-products of phenol manufacture via cumene. Khim.prom. no.9:691-692 S '62. (MIRA 15:11)

(Benzene) (Gases) (Phenol)

RYABININ, S.M.

Economic geography of the Kirovabad and Safaraliev areas (Kirovsk massif) in the Azerbaijan S.S.R. Trudy Inst.geog. AN Azerb.SSR 8:242-274 '59. (MIRA 12:11)
(Azerbaijan--Economic conditions)

MADAT-ZADE, A.A.; RYABININ, S.M.

Export of Azerbaijan petroleum products to foreign countries.
Azerb. neft. khoz. 37 no.4:48 Ap '58. (MIRA 11:8)
(Azerbaijan—Petroleum industry)

RYABININ, S.N., CandTech Sci -- (diss) "Study of dynamic phenomena arising in machines when kinematic chains break." L'vov, 1958, 13 pp with diagrams (Min of Higher Education UkSSR. L'vov Polytechnic Inst) 100 copies (KL, 23-58, 107)

Evabkin, S.N.

PHASE I BOOK EXPLOITATION SOV/4201

L'vov. Politekhnicheskiy institut

Mekhanika (Mechanics) L'vov, 1959. 69 p. (Series: Its: Doklady, tom 3, vyp. 1/2)
900 copies printed.

Editorial Board: A.I. Andriyevskiy, Doctor of Technical Sciences, Professor; Ya.P.Berkman, Honored Scientist and Technologist UkrSSR, Doctor of Chemistry, Professor; K.B. Karandeyev, Corresponding Member, Academy of Sciences USSR and Academy of Sciences UkrSSR, Doctor of Technical Sciences, Professor; M.S. Komarov (Resp. Ed.), Doctor of Technical Sciences, Professor; V.I. Kuznetsov, Doctor of Geology and Mineralogy; B.F. Levitskiy (Deputy Resp. Ed.), Candidate of Technical Sciences, Docent; V.B. Porfir'yev, Member, Academy of Sciences UkrSSR. Doctor of Geology and Minerelogy, Professor; V.A. Tikhonov (Resp. Secretary), Candidate of Technical Sciences, Docent; Tech. Ed.: T. Veselovskiy.

PURPOSE: This booklet is intended for scientific workers and engineers.

COVERAGE: The booklet contains 12 articles on vibrations, impact stresses, transmission and slider-crank mechanisms, fluid mechanics, and strength of reinforced-concrete beams. No personalities are mentioned. References follow several of the articles.

Card 1/3

Mechanics SOV/4201

TABLE OF CONTENTS:

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AVAILABLE: Library of Congress

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9-2-60

SOV/122-59-3-42/42

AUTHOR: Ryabinin, S.N.

TITLE: Investigation of the Dynamic Phenomena Arising in Machines through the Interruption of the Kinematic Chain (Issledovaniye dinamicheskikh yavleniy, voznikayushchikh v mashinakh pri razryve kinematicheskikh tsepey)

PERIODICAL: Vestnik Mashinostroyeniya, 1959, Nr 3, p 88 (USSR)

ABSTRACT: Author's summary of a dissertation submitted to the L'vov Polytechnic Institute (L'vovskiy Politekhnicheskiy Institut) for the attainment of the Degree of Candidate of Technical Sciences. The dynamic forces in the links of a kinematic chain of two, three and four mass system in the event of interruption or partial weakening of the kinematic driving train have been established. Expressions for determining the maximum values of the dynamic forces under certain conditions of loading have been derived.

Card 1/1

USCOMM-DC-60,676

RYABININ, S.N.

Dynamic stresses in the kinematic chain of flexible driving system. Dokl.LPI 3 no.1/2:9-14 '59. (MIRA 13:6)
(Machinery, Kinematics of)

SOV/124-58-5-5022

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 12 (USSR)

AUTHOR: Ryabinin, S.N.

TITLE: On the Dynamic Phenomena Accompanying Disengagement of the Kinematic Linkage of an Elastic Drive System (O dinamicheskikh yavleniyakh, voznikayushchikh pri razryve kinematicheskoy tsepi privodnoy uprugoy sistemy)

PERIODICAL: V sb.: Nekotoryye vopr. dinamiki mashin. L'vov, un-t, 1956, pp 42-60

ABSTRACT: A solution is found for the dynamic problem of an elastic four-body system, to which various of the mechanisms of complex machinery can be reduced. A case is examined wherein the disengagement of the kinematic linkage of a mechanism makes it possible to study separately two two-body elastic systems. A numerical example is given.

V.A. Zinov'yev

1. Mechanical drives--Mathematical analysis 2. Mechanics

Card 1/1

BAKANOV, N.V.; LYUBARSKIY, G.E.; RYABININ, V.L.

Bibliography. Standartizatsiia 28 no.9:62-64 S '64. (MIRA 18:2)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001446230002-9"

PLYASHKEVICH, A.M.; PLANOVSKIY, A.N.; BULATOV, S.N.; RYABININ, V.A.
ZELINSKAYA, L.G.

Study of caffeine extraction in the column extractor with sieve plates. Med. prom. 17 no.6:32-36 Je'63 (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze i Moskovskiy institut khimicheskogo mashinostroyeniya.

RYABININ, V.B., inzh.; PAPANOV, V.I., inzh.

Calculation of lever limiters for the hoisting capacity of jib cranes. Bezop. truda v prom. 8 no.12:51-53 D '64.
(MIRA 18:3)

1. Kostromskoy ekskavatornyy zavod.

Ryabinin, V.E.

112-3-5419

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 3, p.52 (USSR)

AUTHOR: Ryabinin, V.E.

TITLE: Effect of Rotor Rim on Power Output of a Uniflow Turbine (Vliyaniye oboda rabochego kolesa na energeticheskiye kachestva pryamotochnoy turbiny)

PERIODICAL: Tr. Vses. n.-i in-ta gidromashinostr., 1956, Nr 19, pp. 41-56

ABSTRACT: Bibliographic entry.

ASSOCIATION: All-Union Scientific Research Institute for Construction of Hydraulic Machinery (Vses. n.-i in-t gidromashinostro).

Card 1/1

LUKIN, N.I., inzh.; RYABININ, V.I., inzh.

Photoelectric photometer with an integrating sphere. Svetotekhnika 6 no.5:13-17 My '60. (MIRA 13:12).
(Photometers)

1. VISTELYUS, A. B.; MIKLUKHO-MAKLAY, A. D.; RYABININ, V. N.

2. USSR (600)

4. Limestone-Tuarkyr

7. Devonian limestones from the red-colored strata of Tuarkyr, Dokl. AN SSSR 90 No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953. Uncl.

RYABININ, V.N.

Upper Devonian stromatoporoids of Timan Ridge. Trudy VNIGRI no.90:5-90 '55. (MLRA 10:2)

(Timan Ridge--Coelenterata, Fossil)

RYABININ, V.M. (g. Pushkino, Moskovskoy oblasti)

Effect of gases from industrial plants on the growth of trees and shrubs. Bot.zhur. 47 no.3:412-416 Mr '62. (MIRA 15:3)
(Plants, Effect of gases on)

15-1957-3-2663

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 3, p 24 (USSR)

AUTHOR: Ryabinin, V. N.

TITLE: Upper Devonian Stromatoporoids of Timan (Verkhnedevonskiye stromatoporoidei Timana)

PERIODICAL: Tr. Vses. neft. n-i. geol-razved. in-ta, 1955, vol 90, pp 5-90

ABSTRACT: The author describes 26 species and 2 varieties from the families Actinostromidae (11 species and 1 variety of the genera Actinostroma and Clathrodictyon, 3 of the species and the variety being new), Stromatoporidae (12 species and 1 variety of the genera Stromatopora, Stromatoporella, and Parrellelopora, 5 species and the variety new), and Idiostromidae (3 new species of the genera Hermatostroma and Amphipora). Preliminary study was also made on calcareous microalgal nodular forms of oncolitic (rolled) and stromatolitic types. The groups of identified stromatoporoid species permit determination

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15-1957-3-2683

Upper Devonian Stromatoporoids of Timan

of the age of the formations within the limits of a stage and make it possible to correlate the Upper Devonian section of Timan with that of other regions. The Izhma beds, according to discoveries of Actinostroma dobrolubovae Riab., correspond to the lower part of the Frasnian stage on the western slope of the Urals. The stromatoporoids of the Ukhta beds are similar to those of the Chudovo beds of the Clavnyy Devonian field, but none of these fossil forms have yet been found in Frasnian deposits. The Siracha beds are characterized by species which have been recognized in the upper part of the Frasnian rocks on the western slope of the Urals. The paper has 25 tables and a bibliography with 37 references.

I. I. Ch.

Card 2/2

15-57-4-4187

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 4, p 22 (USSR)

AUTHOR: Ryabinin, V. N.

TITLE: Carboniferous and Permian Paleoaplysinids in the Urals and Timan (O kamennougol'nykh i permskikh paleoaplizinakh Urala i Timana)

PERIODICAL: Tr. Vses. neft. n.-i. geol-razved. in-ta, 1955, Nr 90, pp 331-349.

APSTRACT: Paleoaplysinids are found as convolute, broadly cylindrical tubes or as broken plates two to seven millimeters thick, commonly very close and parallel to each other. Conical or rounded prominences occur on the surfaces of the plates. Accumulations of paleoaplysinid plates locally form continuous masses in the reef bodies. They are common in the Carboniferous and Permian rocks of the Urals and of Timan. Paleoaplysinids have been described under the terms Palaeoaplysina Krot., 1888; Mezenia Stuck., 1895; and Uralotiminia

Card 1/2

Carboniferous and Permian Paleoaplysinids in the Urals (Cont.)

Riab., 1913. They have been variously referred to the rugose corals, to the order Stromatoporoidea, and to the order Tubulariae. A study of the original forms of P. I. Krotov, A. A. Stuckenberg, and V. N. Ryabinin and of a great number of specimens from the Carboniferous and Permian deposits of the Urals and of Timan has shown that the paleoaplysinids belong to the one genus Palaeoaplysina Krot, which is in the order Tubulariae, Hydrozoa. The author concludes by giving some admonitions on the collecting of paleoaplysinids and on methods of studying them. The paper contains six tables.

I. I. Ch.

Card 2/2

RYABININ, V.N.

Carboniferous and Permian Paleoaplysina of the Urals and Timan Ridge. Trudy VNIGRI no.90:331-337 '55. (MLRA 10:2)

(Ural Mountains--Paleontology, Stratigraphic)
(Timan Ridge--Paleontology, Stratigraphic)

RYABININ, V.P.

The law of the near-saturation state of a single iron silicide crystal. Izv. Sib. otd. AN SSSR no.5:81-86 '62. (MIRA 18:2)

1. Krasnoyarskiy pedagogicheskiy institut.

KIRENSKIY, L.V.; RYABININ, V.P.

Study of the law of approach to saturation on iron silicide single crystals at various temperatures. Kristallografiia 7 no.4:634-637 Jl-Ag '62. (MIRA 15:11)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR i Krasnoyarskiy pedagogicheskiy institut.
(Iron silicide crystals)

[redacted], V. I.

[redacted]

[redacted] quality of stored forest seeds. Les. Hoz. 5 No. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

RYABININ, V.Ye., kandidat tekhnicheskikh nauk.

Selection of the distance between the axial guide vanes and the runner of hydraulic turbines. Trudy VIGM no.19:34-40 '56. (MLRA 10:2)

(Hydraulic turbines)

DENISOV, Ivan Pavlovich; YAROSHENKO, I.F., kand. tekhn. nauk, retsenzent; RYABININ, V.Ye., kand. tekhn. nauk, retsenzent; MITROFANOVA, N.P., kand. tekhn. nauk, retsenzent; MOLCHANOVSKIY, A.S., red.; FRIDKIN, L.M., tekhn. red.

[Principles of the use of water power] Osnovy ispol'zovaniia vodnoi energii. Moskva, Izd-vo "Energiia," 1964. 363 p. (MIRA 17:4)

1. Vsesoyuznyy zaochnyy energeticheskiy institut (for Yaroshenko, Ryabinin, Mitrofanova).

RYABININ, V.Ye., kandidat tekhnicheskikh nauk.

Effect of the runner band on the power qualities of the direct-flow turbine. Trudy VIGM no.19:41-56 '56. (MLRA 10:2)

(Hydraulic turbines)

MYAGKIN, Ye.

Demonstration model of a plane. Politekh.obuch. no.4:94 Ap '59.
(MIRA 12:7)

1. Barnaul'skaya shkola TASSR.
(Planes (Hand tools))

RYABININ, Ye.

Lecture bureau for road workers. Avt.dor.19 no.2:32-33 F '56.
(Velikiye Luki--Lectures and lecturing) (MLRA 9:6)

RYABININ, Ye.

Lecture bureau for road workers. Avt.der.19 no.2:32-33 F '56.
(Velikiye Luki--Lectures and lecturing) (MLRA 9:6)

L 31283-65 EWT(1)/EWA(h) Peb
ACCESSION NR: AP5005351 S/0109/65/010/002/0358/0360

AUTHOR: Ryabinin, Yu. A. 15 13

TITLE: Method for cutting down the minimum duration of pulses circulating in a delayed-feedback system

SOURCE: Radiotekhnika i elektronika, v. 10, no. 2, 1965, 358-360

TOPIC TAGS: feedback theory, delayed feedback 25

ABSTRACT: The circulation of pulses in a system consisting of series-connected linear, nonlinear, and delay units was considered by Yu. I. Neymark, et al. (Rad. i elektronika, 1958, 3, 11, 1348) with these assumptions: the linear unit is described by a transient response $\varphi(t)$, the nonlinear unit characteristic can be approximated by a unit-step function, and the delay unit is a linear dispersionless quadripole. The present short article considers the same problem in the case when the clipping (cutoff) level of an n-th pulse in the nonlinear unit depends on

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the duration of the preceding (n-1)-th pulse. It is found that: (1) Stationary oscillations are possible with any transient response of the linear unit (not only when $\varphi(t)$ was a nonmonotonous function); (2) Shorter pulses can circulate in a self-controlled system. Orig. art. has: 1 figure and 7 formulas.

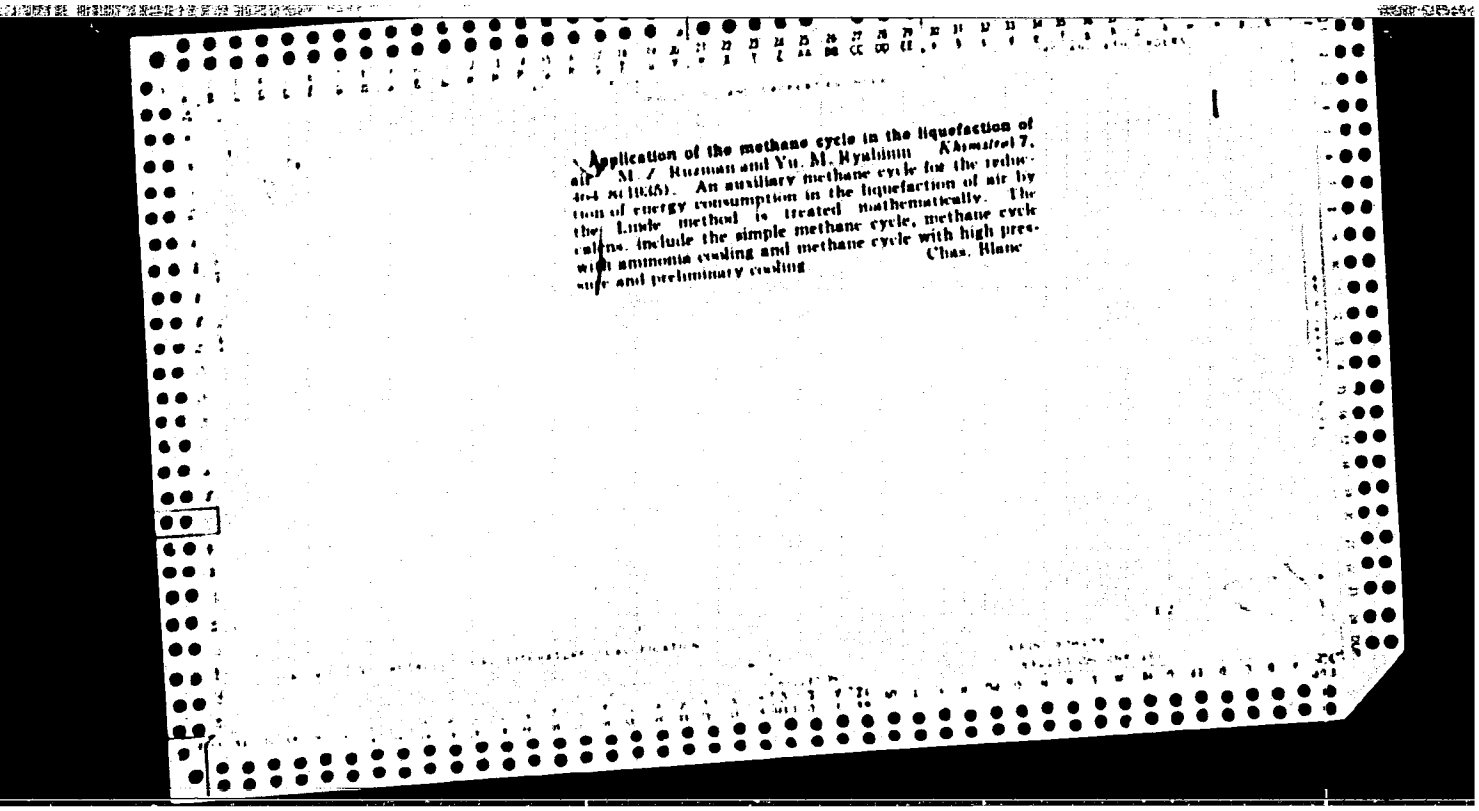
ASSOCIATION: none

SUBMITTED: 21Jan64 ENCL: 00 SUB CODE: EC

NO REF SOV: 002 OTHER: 000

RABININ, Yu.A.

One method for decreasing the minimum duration of impulses circulating in a system with delayed feedback. Radiotekh. i elektron. 10 no.2:358-360 F '65. (MIRA 18:3)



Application of the methane cycle in the liquefaction of air. M. P. Rusman and Yu. M. Nyuhinin. *Kislorod* 7, 4-8 (1938). An auxiliary methane cycle for the reduction of energy consumption in the liquefaction of air by the Linde method is treated mathematically. The cycles include the simple methane cycle, methane cycle with ammonia cooling and methane cycle with high pressure and preliminary cooling. Chas. Blanc

GENSHAFT, Yu.S.; NASEDKIN, V.V.; RYABININ, Yu.N.; PETROV, V.P.

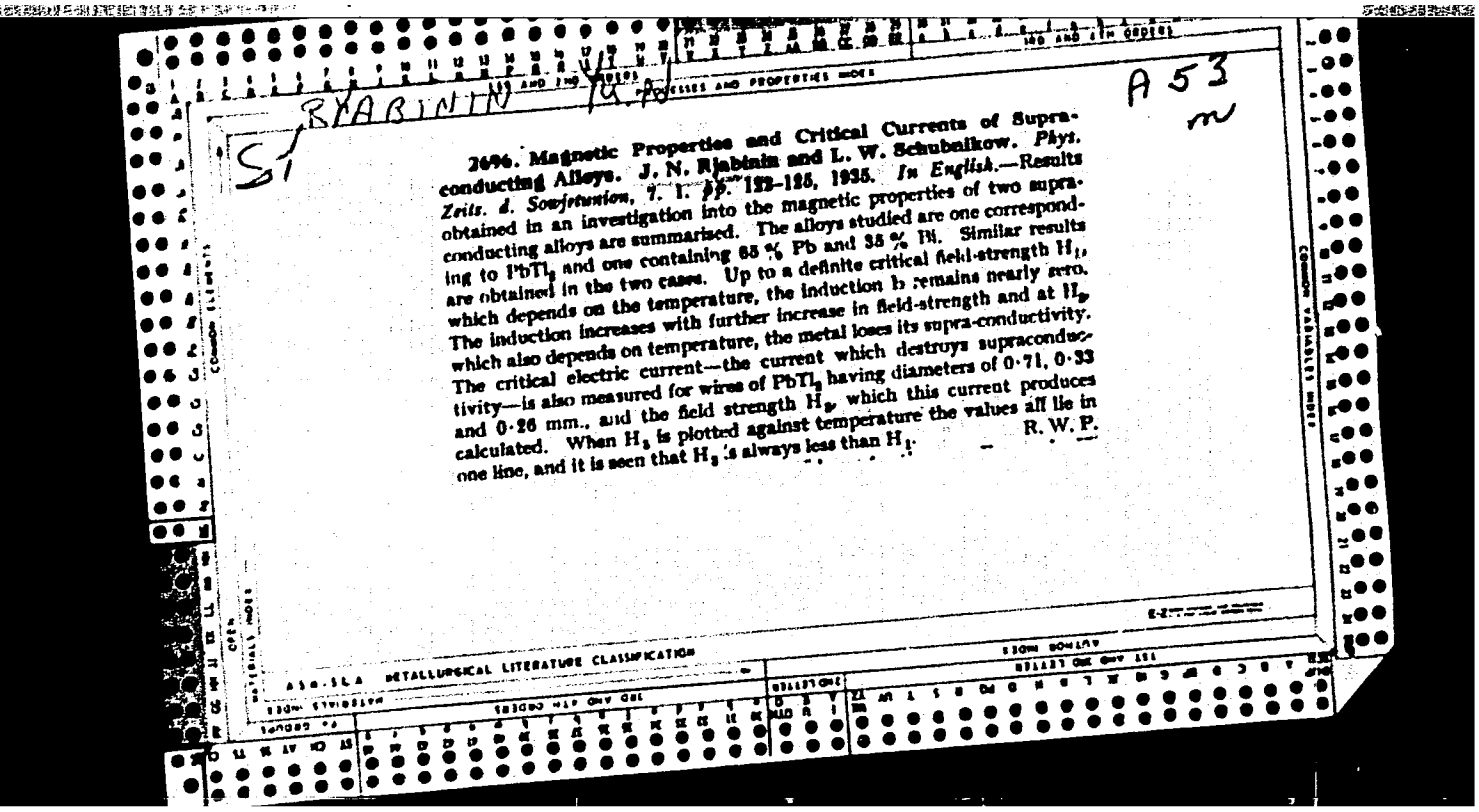
Crystallization of basalt at the pressure of 25 kilobars and temperatures from 800° to 1300°. Sov. geol. 8 no.8:26-31 Ag '65. (MIRA 18:10)

1. Institut fiziki Zemli AN SSSR i Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii AN SSSR.

RYABININ, Yuriy Nikolayevich

(h) _____ and L. V. Shubnikov, Physikalische Zeitschrift der Sowjetunion, 1934, Vol 6, pp 557-568, Magnetization Cycle of Superconducting Lead.

"By 2 different methods the magnetization cycle of polycryst. Pb was plotted at 4.24°K. On first magnetization the induction B remains nil up to the crit. field H_k = 550 gausses, where it rises abruptly to $B_k = H_k$ as the metal passes from the superconducting to the ordinary state (μ = 1). For stronger fields B = H. The backward path of B is also discontinuous at H_k, but the process is markedly hysteretic and at H = 0 the residual B is 18% of B_k. Further changes of H give a perfectly sym. cycle."



RYABININ

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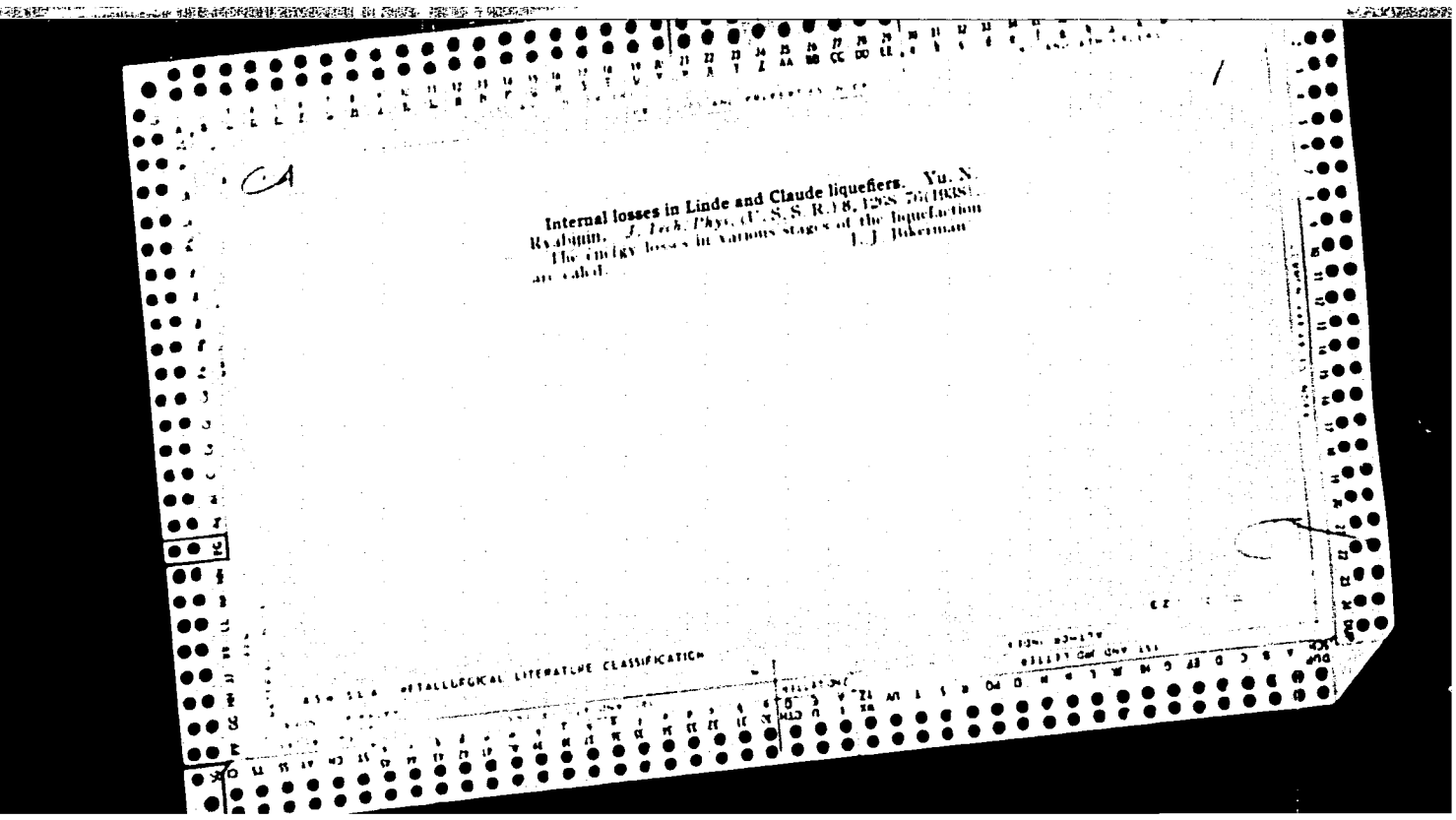
2696. **Magnetic Properties and Critical Currents of Supra-conducting Alloys.** J. N. Rjabinin and L. W. Schubnikow. *Phys. Zeits. d. Sowjetunion*, 7. 1. pp. 122–135, 1935. *In English.*—Results obtained in an investigation into the magnetic properties of two supra-conducting alloys are summarised. The alloys studied are one corresponding to $PbTl_2$ and one containing 65 % Pb and 35 % Bi. Similar results are obtained in the two cases. Up to a definite critical field-strength H_1, which depends on the temperature, the induction b remains nearly zero. The induction increases with further increase in field-strength and at H_2, which also depends on temperature, the metal loses its supra-conductivity. The critical electric current—the current which destroys supraconductivity—is also measured for wires of $PbTl_2$ having diameters of 0·71, 0·33 and 0·26 mm., and the field strength H_s which this current produces calculated. When H_s is plotted against temperature the values all lie in one line, and it is seen that H_s is always less than H_1. R. W. P.

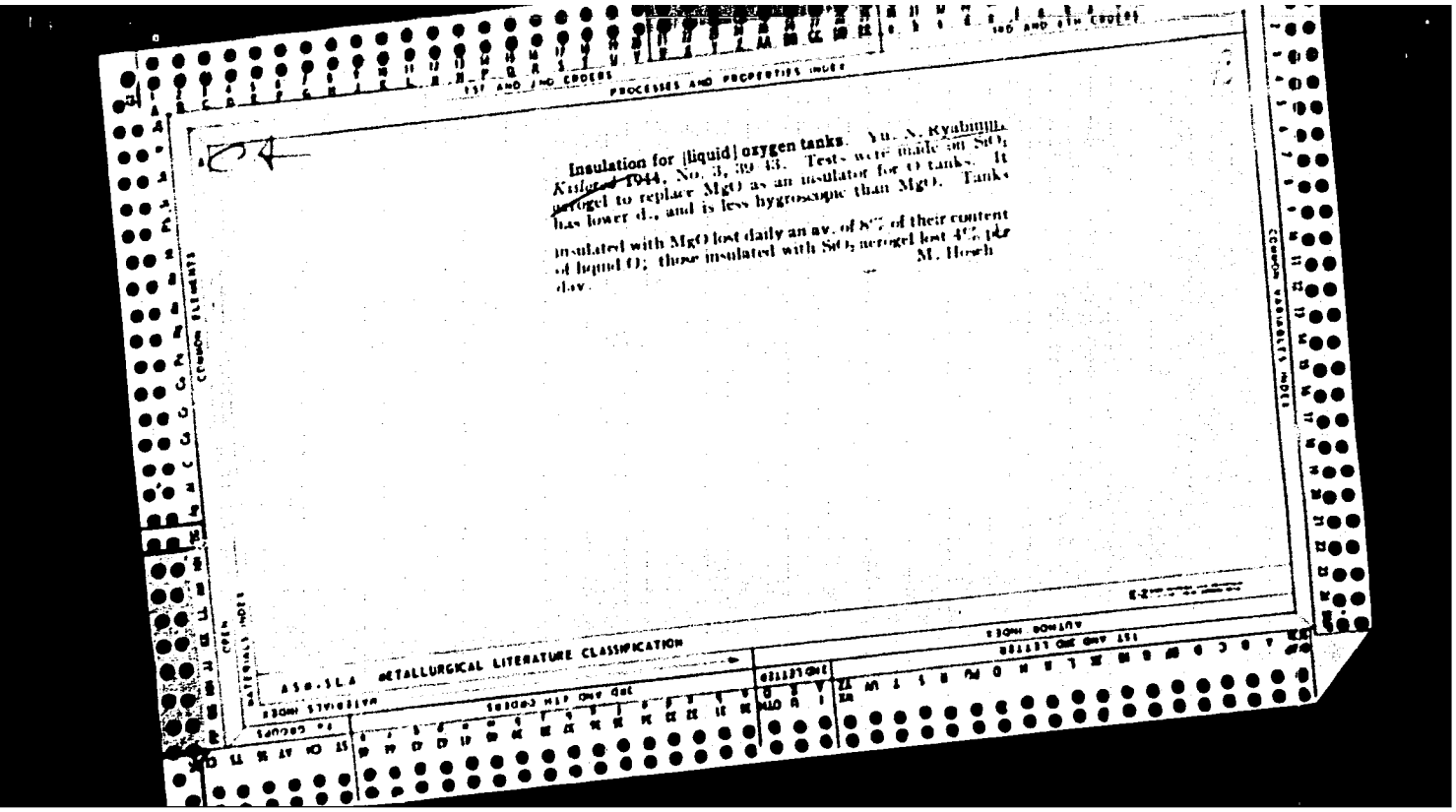
RIABININ, U. N.

*Magnetic Properties of Supraconducting Metals and Alloys. L. V. Shubnikov, V. I. Khotkevich, U. D. Shepelev, and U. N. Riabinin (Zhurnal Eksperimentalnoy; Teoreticheskoy Fiziki (J. Exper. Theoret. Physics), 1937, 7, (2), 221-237).- (In Russian) Measurements were carried out on polycrystalline lead and mercury, on single crystals of lead and tin, and on lead-thallium, lead-bismuth, lead-indium, and mercury-cadmium alloys, and the results are shown graphically. In solid-solution alloys induction depends on field strength up to a certain value of which (H_{K1}) the permeability is practically nil; as the field strength is further increased the permeability also increases and approaches unity at a value H_{K2}. The value (H_{K2}-H_{K1}) increases with increasing concentration of solute metal. These phenomena cannot be explained by hysteresis effects, since they can be obtained both in an increasing and in a decreasing field, the hysteresis effect being quite small. - N.A.



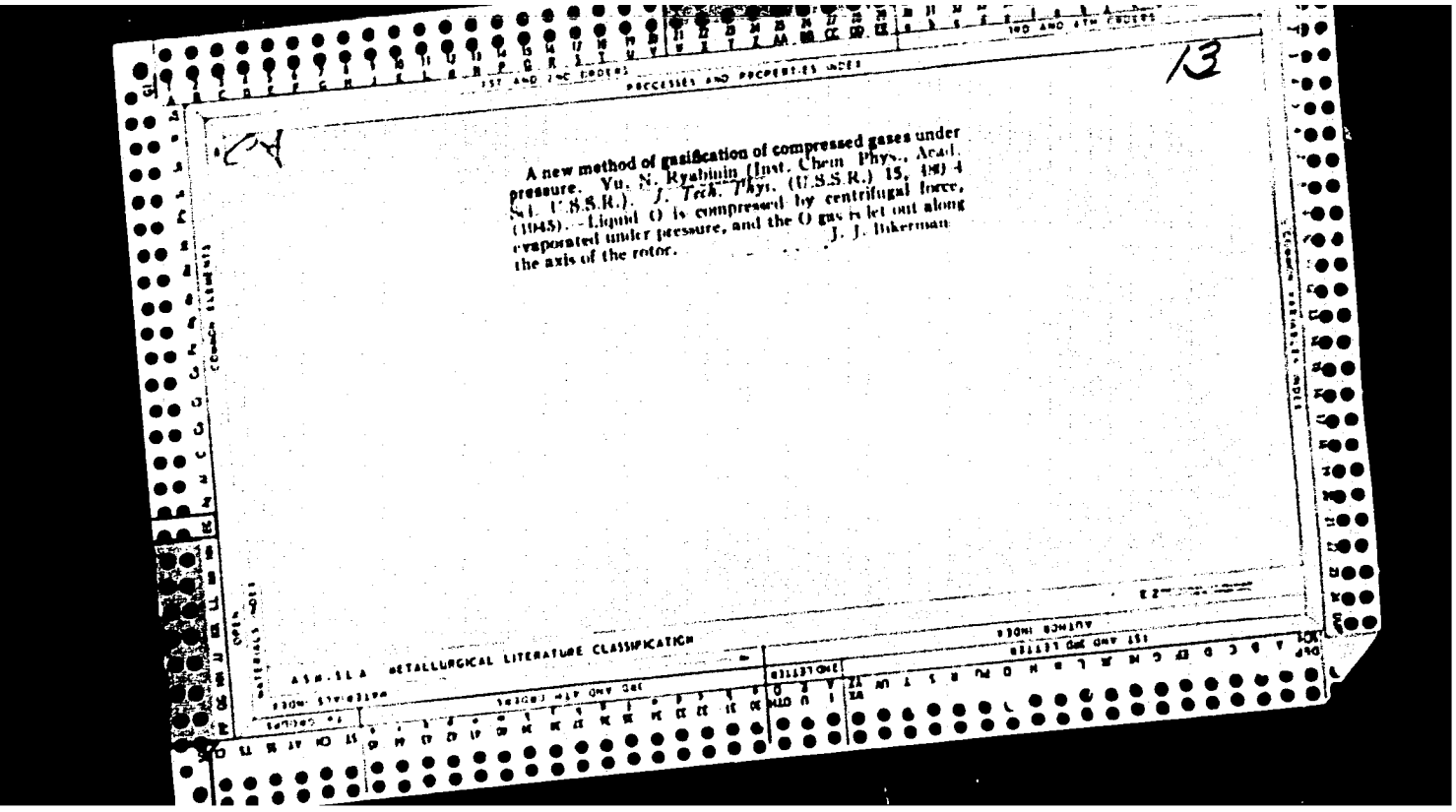
Internal losses in Linde and Claude liquefiers. Yu. N. Rudigin. *J. Tech. Phys. (U.S.S.R.)* 18, 1295-7(1948). The energy losses in various stages of the liquefaction are calcd. I. J. Bikerman

A 194 51 A METALLURGICAL LITERATURE CLASSIFICATION



Insulation for [liquid] oxygen tanks. Yu. N. Kyabinin. *Kislorod* 1944, No. 3, 39-43. Tests were made on SiO_2 aerogel to replace MgO as an insulator for O tanks. It has lower d.c. and is less hygroscopic than MgO. Tanks insulated with MgO lost daily an av. of 8% of their content of liquid O; those insulated with SiO_2 aerogel lost 4% in a day.
M. Hirsh

METALLURGICAL LITERATURE CLASSIFICATION



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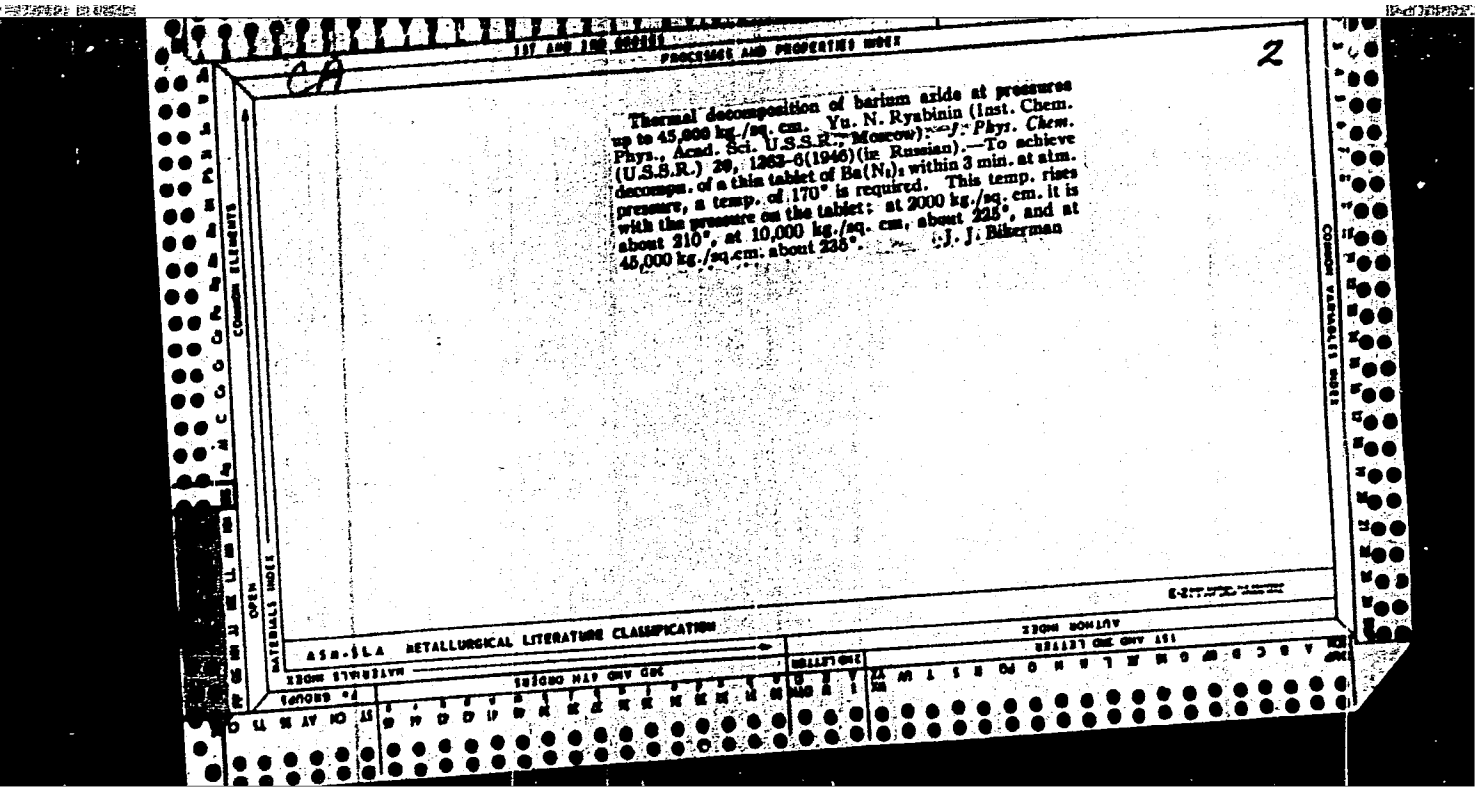
A new method of gasification of compressed gases under pressure. Yu. N. Ryabinin (Inst. Chem. Phys., Acad. Sci. U.S.S.R.). *J. Tech. Phys.* (U.S.S.R.) 15, 189-4 (1945).—Liquid O is compressed by centrifugal force, evaporated under pressure, and the O gas is let out along the axis of the rotor. J. J. Bikerman

RYABININ, Yu. N.

, Kislorod, 1945, Nr 2, The Pump for Regasification of Liquid Oxygen.

RYABININ, Yu. N.

M. I. Blat, S. E. Bresler, and ___(e*)___, Zhurnal Tekhnicheskoi Fiziki, 1945, Vol 15, Nr 12, pp 916-923, A New Method of Preservation of Liquefied Gases (Institut Khimicheskoi Fiziki Akadcmii Nauk S.S.S.R.).



Thermal decomposition of barium azide at pressures up to 45,000 kg./sq. cm. Yu. N. Ryabinin (Inst. Chem. Phys., Acad. Sci. U.S.S.R., Moscow). *J. Phys. Chem.* (U.S.S.R.) 20, 1263–6(1946)(in Russian).—To achieve decompn. of a thin tablet of $Ba(N_3)_2$ within 3 min. at atm. pressure, a temp. of 170° is required. This temp. rises with the pressure on the tablet: at 2000 kg./sq. cm. it is about 210°, at 10,000 kg./sq. cm. about 225°, and at 45,000 kg./sq.cm. about 235°. J. J. Bikerman

2

RYABININ, YU N.

P. T. Riumin and _____(e*)_____, Kislorod, 1946, Nr 4, pp 35-41, Friction and Wear of Metals in the Presence of Liquid Gases.

CA

The influence of pressure on the velocity of thermal decomposition of explosives. Yu. N. E. Ryabinin. *Doklady Akad. Nauk S.S.S.R.* 58, 245-8(1947); *Chem. Zentr.* 1948, I, 544; *cf. C.A.* 41, 2970d.—The individual explosive materials were compressed to tablets under extremely high pressure, then heated electrically, and the pressures developed were measured. The very high pressure influenced the velocity of the thermal decompn. although in general, the effect was not great. The decompn. velocity of *Pb trinitroresorcinate* was increased by the pressure; the decompn. velocities of *Pb azide* and of *nitropentaerythritol* were decreased. The thermal decompn. of all the substances investigated could be divided into 2 periods: (1) an induction period, in which the formation of active centers occurs and (2) a period of acceleration of the reaction velocity, which is always autocatalytic in character. The influence of pressure is such that the velocity of reaction during the first period can be either increased or decreased, while that of the 2nd period can only be decreased. It follows, therefore, that the velocity of the complete decompn. of the explosive will usually be decreased by excessive pressure. M. G. Moore

Inst-Phys. Chem., AS USSR

Doc Physicomath Sci

RYABININ, YU. N.

Dissertation: "Investigation of the Properties of Gases Under Superhigh Pressures and at High Temperatures."
15/12/50

Inst of Chemical Physics, Acad Sci USSR

SO Vecheryaya Moskva
Sum 71

RYABININ, Yu. N.

"Production of Very High Pressures and Temperatures by the Method of Adiabatic Compression," Zhur. Eksptl. i Teoret. Fiz., 23, No 4, 461 (1952).

B-79661, 16 Nov 54

RYABININ, Yu. N.

V11924 AEC-tr-2598

THE ELECTRICAL CONDUCTIVITY OF GASES AT HIGH TEMPERATURES AND DENSITIES. A. E. Karpenko, A. M. Markevich, and Yu. N. Ryabinin. Translated from Zhur. Eksptl'. i Teoret. Fiz. 23, 466-76(1952). 9p.

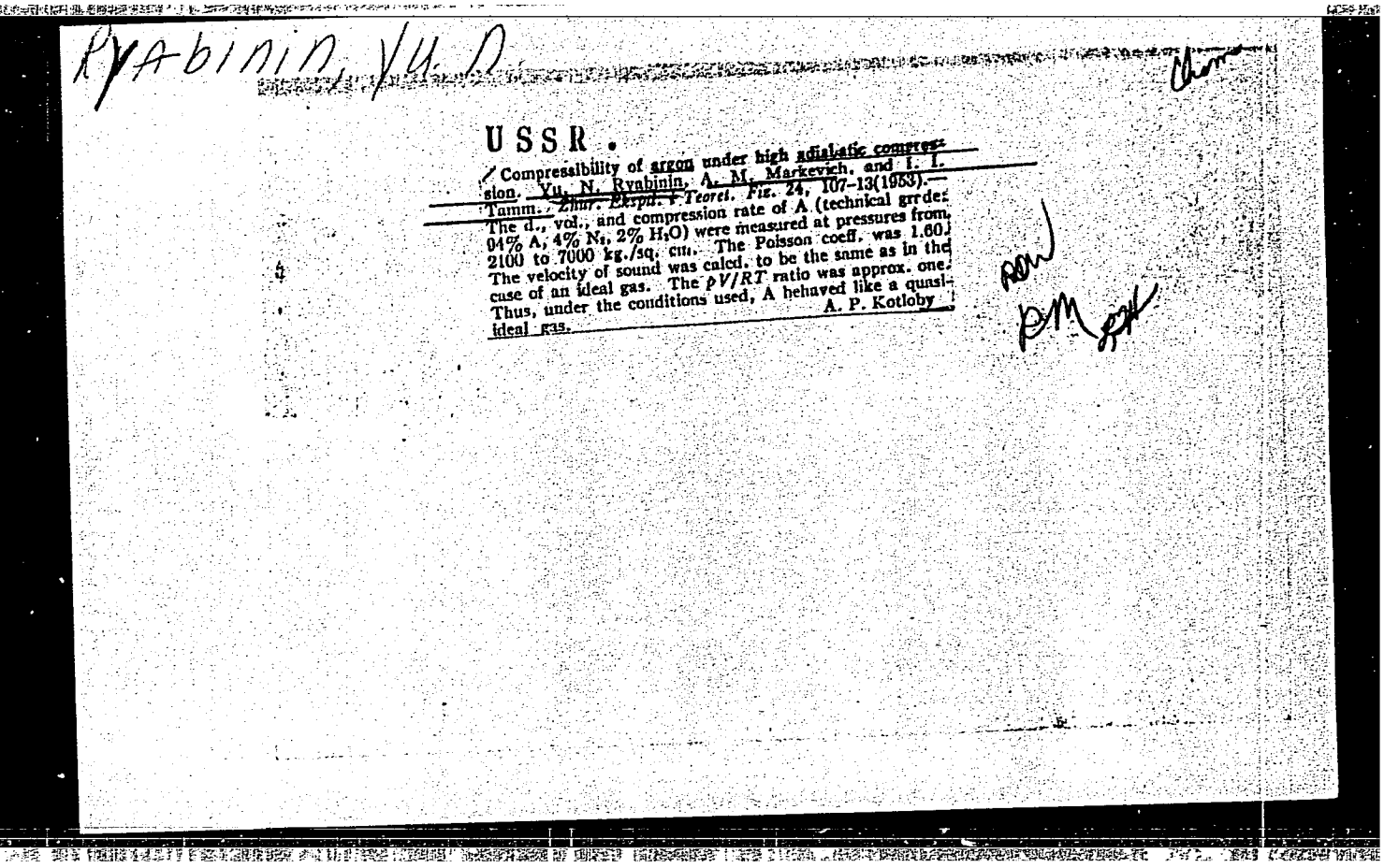
The electrical conductivity of air, A, N_2 and mixtures of the three at temperatures up to 8000°K and pressures of the order of 10^3 kg/cm^2 is described. The conductivity is attributed to the formation of NO at the high temperatures and pressures, since its ionization potential is lowest and N_2 and O_2 were present in the gases used. (T.R.H.)

RYABININ, Yu. N.

USSR

Optical properties of gases at high temperatures and super high pressures. Yu. N. Ryabinin, N. N. Sobolev, A. M. Markevich, and I. I. Tumin. *Zhur. Eksptl. i Teoret. Fiz.* 23, 564-75(1952); *Science Abstr.* 56A, 690-70(1953).—The luminescence of A heated to a temp. of several thousand degrees by the method of adiabatic compression has been studied. It was established that the observed line and band spectra are produced mainly by the luminescence of N_2, which is an impurity in A, and by NO and OH produced during the adiabatic compression from other impurities. When the d. and temps. of the gas are increased, the intensity of the continuous spectrum increases faster than that of the discrete spectrum. It is shown that in the ultraviolet region the distribution of the energy in the continuous spectrum may be described by the Wien formula with a single color temp. The color temp. of A is measured in its dependence on the pressure, at pressures varying from 2000 to 5500 kg./sq. cm. and temps. from 4000° to 9000°K.
R. D. H.

Inst. Chem. Physics, AS USSR



Ryabinin, Yu. N.

USSR.

Compressibility of argon under high adiabatic compression. Yu. N. Ryabinin, A. M. Markevich, and I. I. Tamm. *Zhur. Eksper. i Teoret. Fiz.* 24, 107–13(1953).—The d., vol., and compression rate of A (technical grade: 94% A, 4% N_2, 2% H_2O) were measured at pressures from 2100 to 7000 kg./sq. cm. The Poisson coeff. was 1.60. The velocity of sound was calcd. to be the same as in the case of an ideal gas. The pV/RT ratio was approx. one. Thus, under the conditions used, A behaved like a quasi-ideal gas. A. P. Kotloby

RYABININ, Yu. N. ; MARKEVICH, A. M.; and TAMM, I. I.

"Formation of Nitric Oxide in the Adiabatic Compression of Air Mixtures," (Obrazovaniye okisi azota pri adiabaticheskom szhatii vozdushnykh smesey), Dok. AN SSSR, Vol 45, No 1, pp 111-113, 1954

Translation - D 178251 - 22-3-55

RYABININ, Yu. N.

V
CH

The role of freezing in the reaction of methane oxidation and decomposition at high temperature and very high pressures. Yu. N. Ryabinin, A. M. Markevich, and I. I. Tamm. *Doklady Akad. Nauk S.S.S.R.* 94, 1121–4(1954).—The freezing discussed was the rapid cooling of a reaction mixt. to permit the isolation of the high-temp. intermediate reaction products. A very rapid cooling of the products is essential for the quality of the products obtained, and this was possible with the aid of an available adiabatic app. in which the gas compression and expansion could be performed in exceedingly short time intervals (*C.A.* 47, 3063*d*). The gaseous mixt. at atm. pressure was compressed to several thousand atms. and expanded back to atm. pressure. The max. pressure increase takes place in only 4×10^{-4} sec. during which time the gas temp. can rise at the rate of 10^6–10^7 degrees/sec. Natural gas (94% CH_4, 3% higher hydrocarbons, 3% N_2), mixed with air, O_2, or A (80% A, 14% N_2) was studied, and among the different products detected were NH_3, CH_2O, soot, NO, C_2H_2, and HCN. CH_4 was found stable at temps. below 1700°K.; above 1700°K, CH_4 begins to decompose with deposition of soot, and forms C_2H_2. With N_2-contg. A temps. upwards of 2000°C. were reached, and HCN was found in the products.

W. M. Sternberg

(2)
62

RYABININ, Yu. N.

Formation of nitric oxide during adiabatic compression of air mixtures. Yu. N. Ryabinin, A. M. Markevich, and I. I. Tamm. *Doklady Akad. Nauk S.S.S.R.* 95, 111–13 (1954).—The gas mixt. was rapidly compressed and then expanded by a single-piston stroke in a cylinder. Pressure during the cycle was measured with a piezoelec. manometer with an oscillograph. Cycle time was varied by change in piston travel. Air and 1:1 air-A mixt. were used in the [illegible] conditions. After each cycle the test gas was immediately transferred to an evacuated flask and the NO then oxidized and converted to HNO_3 with 1% aq. H_2O_2, resulting acidity was titrated and reported as NO equiv. NO formation started at 4000 kg./sq. cm. during adiabatic compression of air and steadily increased to about 1% by vol. at max. pressure attained (9000 kg./sq. cm.). In compressing the air-A mixt., NO first appeared at about 1000 kg./sq. cm. and increased somewhat more rapidly with pressure at first, as compared with air (to about 1% at 3000 kg./sq. cm.) and then tended to level off with further pressure increase. The lighter pistons which corresponded to the shorter cycle time and the highest temps. gave the highest NO concns. at pressures above 3000 kg./sq. cm. Harold J. Kandiner

RYABININ, Yu. N.

7

Effect of pressure on the periodic properties of the elements. Yu. N. Ryabinin. *Doklady Akad. Nauk S.S.S.R.* 104, 721-[illegible]. The available data in the literature on the compressibility of the elements show that at pressure of 100,000 kg./sq. cm. the elements should exhibit different properties. The alkali elements are the most compressible, diamond the least, and the compressibility of the alkali metals is the most affected by pressures. Thus, Cs is 240 times as compressible as diamond at atm. pressure, but only 1.4 times at 500,000 kg./sq. cm. At very high pressures, the max. compressibility in metals is displaced toward the atoms with the next at. no., and although Cs has the max. compressibility at 30,000 kg./sq. cm., the max. is transferred to Ba at 100,000 kg. At 200,000 kg./sq. cm., Sr is more compressible than Rb, and Ca than K at 600,000 kg./sq. cm. The change must be attributed to deformation in the outer electron shell and the orbital structure, and the chem. properties, m.p., and coeff. of thermal expansion must change accordingly. W. M. Sternberg.

1 RYABININ, Yu. N.

D-6

Category : USSR/Atomic and Molecular Physics - Physics of high pressure

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 911

Author : Ryabinin, Yu.N.
Inst : Laboratory of Superhigh-Pressure Physics, USSR Acad. of Sciences
Title : Volume Elasticity of Elements at Superhigh Pressures.

Orig Pub : Fiz. Metallov i metallovideniye, 1956, 2, No 2, 225-236

Abstract : Using Bridgeman's experimental data for the relationship $V = f(p)$, the values of the volume-compression modulus were calculated over the wide pressure interval of 5,000 -- 10,000 kg/cm^2 for 51 elements. It was established that in the case of elements that have no polymorphous transitions in the tested interval of pressures, the volume compression modulus K increases linearly with pressure. It is shown that for elements having polymorphous transitions, the volume compression modulus may either increase, decrease, or remain unchanged during the transition. In the first two cases, the modulus varies linearly with the pressure. An analysis of the dependence of the modulus on the pressure in the case of all the elements investigated made it possible to detect previously-unnoticed jumps in the modulus or changes in the slope of the function $K = f(p)$, occurring in the absence of a

Card : 1/2

Category : USSR/Atomic and Molecular Physics - Physics of high pressure

Abs Jour : Ref Zhur - Fizika, No 1, No 911

change in volume for Zr, graphite, Tl, K, Mg, Mn, and Th. Such a change in elasticity may be proof that superhigh pressures cause in the above elements certain internal transformations, occurring without a noticeable change in volume. The coefficients of the equation of state $V = f(p)$ and of the equation of the modulus $K = f(p)$ are determined and it is shown that the values of V and K calculated from these equations are in good agreement with the experimental values. The atomic volumes of the elements are calculated and it is shown that under superhigh pressure they diminish in conformity with the periodic structure of the electron shells of the atoms. Calculations show that at a pressure of 5000,000 kg/cm^2 the atomic volumes already display a weak periodic dependence on the atomic number. The values of the modulus of volume compression are calculated and their variation under the influence of pressure is shown.

Card : 2/2

~~RYABININ, YU.N.~~ RYABININ, YU.N.

CARD 1 / 2 PA - 1820

SUBJECT USSR / PHYSICS
AUTHOR RJABININ, JU.N.
TITLE On Tests carried out in Connection with the Dynamic Compression of a Substance.
PERIODICAL Žurn.techn.fis, 26, fasc. 12, 2661-2666 (1956)
Issued: 1 / 1957

By means of the static method, also if alloys of excessive hardness are used, it will hardly be possible to obtain pressures of much more than 400 000 kg.cm^2. In order to be able to compress a substance up to higher pressures, the author resolved to employ a dynamic method in the course of which compression is brought about from all sides on the container in which the material under investigation is placed. Maximum pressure is limited not by the strength of the container but by the possibility of producing high pressure all round the container. For this purpose it is possible to use detonating explosives. If a flat detonation wave impinges vertically upon the surface of the metal wall, it is possible to obtain pressures of up to 350 000, 390 000, and 475 000 kg.cm^2 along the front of the shock wave propagated along the wall if it is made from Al, Zk or Cu. In order to obtain still higher pressures it is possible to make use of the increase of pressure in the cylindrical shock wave. For this purpose the material is placed into an ampule which is put into a cylindrical metal container which, in turn, is surrounded by an explosive. The pressure P_d which is produced by the shock wave on the surface of the material compressed in the ampule, can be computed by means of equations of the gas dynamics and the theory of shock waves. Experiments had to be

carried out in such a manner that the compressed substance was conserved for the following examination. When P_d was more than 550 000 kg.cm^{-2}, all cylinders burst. The ampules usually remained intact at P_d = 300 000 kg.cm^{-2}, and sometimes at 470 000 kg.cm^{-2}. Considerable interest is caused by reversible processes which take place within the material during compression. After the method of dynamic compression had been worked out in its essential features, investigations were carried out and several results with respect to reversible modifications of the properties of substances subjected to the effect of shock waves were obtained. Tests were carried out with mineral salts, lead nitrate, copper sulphate, magnesium carbonate, yellow sulphur, and hydrocarbon. Experiments carried out with a graphite rod served the purpose of the synthetic production of diamonds from graphite. These experiments, which were carried out in 1953/1954, failed. Only after BUNDY, HALL, STRONG, and WENTORF succeeded in carrying out this synthesis in 1955 and found that the process of crystallization took place rather slowly, did it become clear that, on the occasion of the rapid compression carried out in connection with the present work, it was not possible to produce diamonds synthetically because of the lack of sufficient time for a transformation of the lattice.

INSTITUTION: Institute for Chemical Physics, Moscow

R.YABININ, Yu N.

CARD 1 / 2 PA - 1255

SUBJECT USSR / PHYSICS
AUTHOR RJABININ, JU.N.
TITLE The Sublimation of a Crystal Lattice under the Effect of a Strong Shock Wave.
PERIODICAL Dokl.Akad.Nauk, 109, fasc.2, 289-291 (1956)
Publ. 7 / 1956 reviewed 9 / 1956

The question is examined as to what energies a substance is able to absorb if compressed up to different ultrahigh pressures. In the case of isothermal compression of 1 gram-mol (58,46 g) NaCl crystals at room temperatures of from 1 to 1,000.000 kg/cm^2, 81 kilo calories are used. (The corresponding sublimation heat amounts to about 18° C 57,1 kilo calories). In the substance compressed in this manner an elastic energy of 3,5 eV per mol is contained. In the case of compression along the HUGONIOT adiabates the energy concentrated in the substance is even greater.
When a strong shock wave passes along the substance, the compression of the substance on the front of this wave develops along a HUGONIOT adiabate, but expansion develops along a POISSON adiabate. Therefore the energy of the body is greater on the occasion of expansion. The stronger the compression of the body on the wave front, the larger will be this difference in energy. It may be that the energy contained by the body after very strong compression is sufficient for the sublimation of part of the molecules.
For the verification of these deliberations the pressure caused on the occasion of the detonation of explosives as well as its amplification by a

AUTHORS: Beresnev, B.I., Vereshchagin, L.F., Ryabinin, Yu. N. (Moscow). 24-5-5/25

TITLE: Certain features of the rheological behaviour of metals pressed through a die by means of a liquid under high pressure (without a plunger). (Ob osobennostyakh reologicheskogo novedeniya metallov, pressuyemykh zhidkost'yu).

PERIODICAL: "Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk" (Bulletin of the Ac.Sc., Technical Sciences Section), 1957, No.5, pp.48-55 (U.S.S.R.)

ABSTRACT: Pressing of metals in the cold state can be effected either by means of a plunger pressing against the work or by means of fluid under high pressure. The first method is at present very widely used but owing to the very high friction forces between the material and the die walls it cannot be applied to metals with high yield points. This obstacle can to a certain extent be eliminated by using the second method, namely, pressing by means of the hydrostatic pressure of a liquid. The here described experiments were carried out by the Laboratory of Super-high Pressure Physics of the Ac.Sc. (Laboratoriya Fiziki Sverkhvysokikh Davleniy AN SSSR) and represent one of the first attempts to obtain

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Certain features of the rheological behaviour of metals pressed through a die by means of a liquid under high pressure (without a plunger). (Cont.) 24-5-5/25

angle for aluminium and copper, whilst Fig.7 shows the dependence of the pressing pressure on P on the magnitude of the entering angle of the die. Graphs, Figs. 8—10 give theoretically calculated values, which are compared with experimental results. Compared to the process of pressing metals through dies by means of a plunger, pressing of dies by applying hydraulic pressure has the following advantages: the total pressing pressure is considerably reduced since there are no losses caused by friction in the cylindrical part of the die; the resulting reduction in the total required pressing force also leads to a reduction of the friction coefficient between the metal and the die; the reduction in the friction coefficient between the metal and the die leads to a considerable reduction of the optimum entering angle as compared to the optimum entering angle in the case of pressing by means of a plunger. There are 10 figures and 9 references, all of which are Slavic.

Card 3/3

SUBMITTED: March 1, 1957.

ASSOCIATION: Laboratory of Super-high Pressure Physics of the Ac.Sc. (Laboratoriya Fiziki Sverkhvysokikh Davleniy AN SSSR)

AVAILABLE:

RYABININ, Yu. N.

AUTHORS: Ryabinin, Yu. N., Livshits, L. D., Vereshchagin, L. F. 57 -1o-18/33

TITLE: Plasticity of Brass at Superhigh Pressures (Plastichnost' latuni pri sverkhvysokikh davleniyakh)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 1o, pp. 2321-2325 (USSR)

ABSTRACT: The mechanical properties of brass were investigated at pressures up to 3o ooo kg/cm^2. The appearance of the break as well as the micro section surface showed that the plasticity of brass increases essentially under pressure. The plastic deformation degree of the torn patterns can be expressed quantitatively by the value of the true deformation: $A=\ln(S_o/S_p).S_o$ is the cross section before the experiment and S_p the cross section at the rupture locations. It was evident that the occurring saturation of the plasticity curve which is characteristic of brass is not the result of defects of the material. The experiments also confirm that the plasticity curve changes into a saturation. This takes place at 4ooo kg/cm^2. The actual deformations occurring in the case of breaking of the patterns were somewhat smaller than the theoretical ones. It was shown that the plasticity increases essentially up to a pressure of 3oo9 kg/cm^2 and approaches then, as already mentioned at 4ooo kg/cm^2 saturation. Thus a new kind of the de-

Card 1/2

pendence of the plasticity on pressure was detected, as the author determined. There are 3 figures and 5 Slavic references.

ASSOCIATION: Laboratory for the Physics of Superhigh Pressures AN USSR, Moscow (Laboratoriya fiziki sverkhvysokikh davleniy Akademii Nauk SSSR, Moskva)

SUBMITTED: March 2, 1957

AVAILABLE: Library of Congress

RYABININ, Yu. N.

AUTHORS Likhter, A.I., Ryabinin, Yu.N., Vereshchagin, L.F. 56-3-10/59

TITLE Phase Diagram of Cerium.
(Fazovaya diagramma tseriya.-Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiz., 1957, Vol 33, Nr 3, pp 610-613 (U.S.S.R.)

ABSTRACT The p - T diagram of a 99.8 % chemically pure cerium preparation was measured in the temperature range +100°C to -71°C and the following points were found:

T°C	p(kg/cm²)
+94,5	11100
+20	8100
+17	7600
+4	7150
-71	3550
-150 (exterpolated)	1

The phase equilibrium line in the - p - T diagram is a straight line with the inclination 43 kg/cm² .grad.
There are 1 table, 3 figures and 1 Slavic reference.

ASSOCIATION Laboratory for Maximum Pressures, ANUSSR.
(Laboratoriya fiziki sverkhvysokikh davleniy Akademii nauk SSSR.)

SUBMITTED March 26, 1957
AVAILABLE Library of Congress.
Card 1/1

RYABININ, YU. N.

AUTHOR: MARKEVICH,A.M., TAMM,I.I., RYABININ,YU,N. PA - 2776

TITLE: Formation of Hydrocyanic Acid under Strong Adiabatic Compression of Gas Mixtures. (Obrazovaniye sinil'noy kisloty pri sil'nom adiabaticheskom szhatii gazovykh smesey, Russian)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 4, pp 856 - 859 (U.S.S.R.)

Received: 6 / 1957 Reviewed: 7 / 1957

ABSTRACT: In the authors' previous works the reaction of the forming of nitrogen oxide was investigated by high adiabatic compression. It was also possible to obtain yields of up to 1% from pure air within some ten thousandths parts of a second at a compression of up to 700 and a pressure of 8000 - 9000 kg/cm^2. By dilution of the mixture with argon, by which higher temperatures were attained, or by the addition of fuels (methane, H_2, CO), the authors were able to increase the nitrogen yield up to more than 3 % by increasing the temperature by means of combustion. Under these circumstances the production of HCN is also possible and was studied on this occasion. Thermodynamic considerations point to the face that with a rise of temperature the equilibrium is shifted in the case of this reaction in favor of the formation of HCN, which is similar to what is the case with the formation of NO. Now HCN formation in nitrogen-hydrocarbon mixtures, i.e. methane, and acetylene, was investigated. In the case of methane there was no reaction up to 10 000 kg/cm^2. Only considerable additions of

Card 1/2

AUTHORS: Rabinin, Yu. N., Vereshchagin, L. F., Balashov, D. B. and Livshits, L. D.

TITLE: Equipment for Mechanical Studies of Metals at Pressures up to 30 000 kg/cm^2 (Apparatura dlya mekhanicheskikh issledovaniy metallov pri davleniyakh do 30 000 kg/cm^2)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 2, pp 79-85 (USSR)

ABSTRACT: A description is given of an apparatus which produces a hydrostatic pressure of up to 30 000 kg/cm^2 in a liquid enclosed in a chamber 13 mm in diameter and 40-70 mm long. The principle of the device is illustrated in Fig.1. The high pressures are produced within a chamber drilled in a conical metallic body. In order to be able to withstand pressures greater than 20 000 kg/cm^2 this conical member is supported by a close fitting female cone. Experiments have shown that the best angle of this cone is 5°. The same value was used by Bridgman (Refs.1 and 5). The multiplicator is also of the type described by Bridgman in Refs.5 and 6. The multiplicator is shown diagrammatically in Fig.3. The apparatus was designed for experiments on various specimens placed within the pressurised region. The force applied to the specimens is measured by a "compressimeter" described by Bridgman in

Equipment for Mechanical Studies of Metals at Pressures 30 000 kg/cm^2.

Ref.2. The pressure was measured by a manganin manometer. The apparatus has been used to investigate the behaviour of steel at high pressures. Fig.8 shows photographs of steel specimens stretched to breaking point under various pressures. There are 8 diagrams, no tables and 10 references, of which 3 are English, and the rest Soviet.

ASSOCIATION: Laboratoriya Fiziki sverkhvysokikh davleniy AN SSSR (Laboratory of Ultra-high Pressure Physics of the Academy of Sciences USSR)

SUBMITTED: July 25, 1957.

Card 2/2

1. Metals---Mechanical properties 2. Metals---Pressure
3 High pressure equipment---Applications

AUTHOR: Ryabinin, Yu.N. SOV/126-6-5-20/43

TITLE: Application of Super-hard Alloys (Super C bides) in High-pressure Vessels (Primeneniye sverkhtverdykh splavov v sosudakh vysokogo davleniya)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 5, pp 893 - 899 (USSR)

ABSTRACT: In recent years several papers (Refs 1 - 3) have been published on the properties of materials at high pressures. Various authors (Refs 4-9) have described apparatus which they used in individual experiments but no data are available on the physical and mechanical properties of cemented carbides and on the strength of vessels (piezometers) produced from such cermets. The author of this paper aimed at collecting literary data on the necessary mechanical and physical properties of cermets, evaluating the permissible pressures in piezometers and summarising the experimental results available as regards manufacture and operation of individual assemblies and components from such materials, with particular emphasis on applications in high-pressure apparatus. In the best steel piezometers, pressures of

Card1/4

Application of Super-hard Alloys (Super Carbides) in High-pressure Vessels

up to 30 000 kg/cm^2 can be produced; for obtaining higher pressures it is necessary to use tungsten carbides, which are very hard but also very brittle. Therefore, it is necessary to select a correct grade of the carbide and to know exactly the physical and mechanical properties of the material. Although it would seem that the higher the hardness of the carbide the larger is the pressure which the piezometer can withstand, this is not so since the brittleness of the material has to be considered. In Figure 1 the dependence is graphed of the compression strength on the hardness for tungsten carbides containing a cobalt binder. In Figure 2 the dependence is graphed of the compression strength on the percentual content of cobalt in the tungsten carbide. It can be seen from these that the values given by various authors differ little and the same applies for other data on the properties of carbides. After reviewing the available (literary) data on the properties of carbides, the author calculates the maximum permissible pressures in the pistons and in the cylinder walls of piezometers produced

from such carbides. It follows from the derived relations, Eq (5), that provided the material of the piezometer is not stressed beyond the elastic range, the permissible pressure inside the cylinder will be the higher the higher the permissible tangential stress on the inner diameter of the cylinder, the higher the ratio of the outer to the inner diameter and the higher the external pressure. No practical advantage is gained by increasing the ratio of the outer to the inner diameter above 4 to 5. The permissible pressures in a piezometer with a diameter ratio of 3 or 5 can be up to 45 000 kg/cm^2 in the case of the external pressure being the atmospheric pressure and up to 100 000 kg/cm^2 if the hydrostatically maintained pressure equals 30 000 kg/cm^2. The possibility of obtaining such pressures in this way in piezometers made of carboloy was first proved by Bridgeman. It can be assumed that the real maximum permissible pressures in piezometers can be higher than those calculated since the calculations were made for infinitely long cylinders.

SOV/126-6-5-20/43

Application of Super-hard Alloys (Super Carbides) in High-pressure Vessels

Experience gained with apparatus made of carbides shows that the pressures which should be attainable on the basis of data for a given carbide are not always attained. This is due to various factors, e.g. fatigue of the material due to having been subjected earlier to higher stresses, deficiencies in manufacture, sintering and design. There are 7 figures and 23 references, 6 of which are Soviet, 1 French, 2 German and 14 English.

ASSOCIATION: Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR (Laboratory of Physics of Very High Pressure, Ac.Sc.USSR)

SUBMITTED: March 6, 1957 (initially)
August 5, 1957 (after revision)

Card 4/4

SOV/136-58-8-14/27

AUTHORS: Beresnev, B.I., Vereshchagin, L.F. and Ryabinin, Yu.N.

TITLE: Installation for Drawing and Rolling Metals in Freely Rotating Rolls in a Liquid under High Hydrostatic Pressure (Ustanovka dlya volocheniya i prokatki v svobodno vrashchayushchikhsya valkakh metallov v zhidkosti pod vysokim gidrostaticheskim davleniyem).

PERIODICAL: Tsvetnyye Metally, 1958, Nr.8, pp.61-63 (USSR)

ABSTRACT: Bridgeman(Ref.1) on the basis of investigations of the effect of pressure on metal properties proposed and carried out preliminary experiments on the rolling and drawing of metals under hydrostatic pressure. Bridgeman (Ref.1) and also the authors, working in the Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR (Laboratory of Super-High Pressure Physics of the AS USSR) (Ref.4), extended the technique and noted the improvement of metal properties. Special installations (Fig.1) have been used to compare the two methods of deformation and served as the basis for an installation produced by the authors for drawing or rolling (idler rolls) metals in hydrostatic pressures up to 10,000 kg/cm^2 (Fig.2). The liquid is supplied by a laboratory

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Installation for Drawing and Rolling Metals in Freely Rotating Rolls in a Liquid under High Hydrostatic Pressure.

compressor rated at 3.8 litres/hour at 10,000 kg/cm^2. The conversion from drawing to rolling is simply effected. The more important parts are made of heat-treated alloy steels. The installation has been used for experiments on the pressure drawing and rolling to various degrees of deformation, but the authors do not give their results. There are 2 figures and 6 Soviet references.

1. Metals--Processing 2. Rolling mills--Design 3. Pressure--Metallurgical effects 4. Water--Applications

Card 2/2

RYABININ, Yu. N.

"The Results of Researches on Plasticity."

report presented at the Conference on Investigation of Mechanical Properties of Non-Metals, by the Intl. Society of Pure and Applied Physics and the AS USSR, at Leningrad, 19-24 May 1958.
(Vest, Ak Nauk SSSR, 1958, no. 9, pp. 109-111)

BERESNEV, V.I.; VERESHCHAGIN, L.F.; RYABININ, Yu.N.

Mechanical properties of aluminum subjected to preliminary plastic deformations at high hydrostatic pressures [with summary in English]. Inzh.-fiz. zhur. no. 9:119-122 S '58. (MIRA 11:10)

1. Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR, g. Moskva i Institut fiziki metallov AN SSSR, g. Sverdlovsk.
(Aluminum--Testing)

SOV/24-58-10-28/34

AUTHORS: Beresnev, B. I., Vereshchagin, L. F., Ryabinin, Yu. N. (Moscow)

TITLE: Role of the Medium in the Extrusion of Metals by Means of a Liquid under High Pressure (Rol' sredy pri vydavlivanii metallov zhidkost'yu vysokogo davleniya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, 1958, Nr 10, pp 144-146 (USSR)

ABSTRACT: Bridgman carried out experiments on extruding copper and steel with a liquid under pressures of up to 12 000 atm. He stated that he did not succeed in finding an optimum regime for this process and, as a result of that, at very high pressures the metal came out of the die in individual bits instead of continuously. Similar work carried out in the Very High Pressure Physics Laboratory of the Academy of Sciences, USSR, has shown that thecorrect selection of the medium which transmits the pressure determines to a considerable extent not only the magnitude of the pressure necessary for effecting flow of the metal but also the quality of the metal after deformation. Information gained during these experiments is reported in this paper. The authors studied

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the influence of various media, which act both as a medium for transmitting the pressure and as a lubricant on the pressure necessary for producing equal deformations. For this purpose aluminium was extruded through a die with a cone angle $\alpha = 40^{\circ}$. The reduction was maintained constant at 0.773. The method was the same as that described in earlier work (Ref.2). The following results were obtained:

Liquid transmitting pressure	Pressure at which the flow of metal begins P. kg/cm^2	Surface quality
Hypoid lubricant	3750	Bad
Transformer oil	5500	Satis-
Transformer oil + kerosene (0.5+0.5)	6500	factory
Transformer oil + kerosene + oleic acid (0.49+0.49+0.02)	6450	"
Kerosene	6900	"
Gasoline	6900	"
Methylated spirits	6075	"
Ethyl alcohol	6450	"

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Table (continued)

Liquid transmitting pressure	Pressure at which the flow of metal begins P, kg/cm²	Surface quality
Water	5500	Good
Water + a layer of hypoid lubricant applied to the surface of the specimen	5000	Excellent

On the basis of the obtained results, the following conclusions are arrived at:

1) The pressure necessary to produce a flow of the metal as well as the surface quality of the deformed metal are greatly dependent on the fluid used.

2) It was found that plating of the specimen with a thin layer

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of a tin-lead solder reduces considerably the pressure necessary for extrusion.
3) Optimum conditions of extrusion were determined, by means of which a high surface quality can be obtained, namely, by applying a thin layer of hypoid lubricant on a specimen which is extruded by means of water.
4) It was found that if the wrong liquid is applied this can lead not only to damage of the surface of the extruded metal but also to its complete destruction. There are 1 table, 1 figure and 6 Soviet references.

ASSOCIATION: Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR, Institut fiziki metallov, AN SSSR (Laboratory of Physics of Very High Pressures, Academy of Sciences USSR, Institute of Metal Physics, Academy of Sciences USSR).

SUBMITTED: May 27, 1958.

BERESNEV, B.I.; VERESHCHAGIN, L.F.; RYABININ, Yu.N.

Extrusion of pipes and parts of complex profile by liquid under high pressure. Inzh.-fiz.zhur. no.11:105-109 N '58. (MIRA 12:1)

1. Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR, g. Moskva, i Institut fiziki metallov AN SSSR, g. Sverdlovsk.
(Extrusion (Metals))

RYABININ, Yu.N.

Effect of all-round hydrostatic pressure on the deformation of metals subjected to stretching [with summary in English]. Inzh.-fiz.zhur. no.12:90-95 '58. (MIRA 11:12)

1. Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR, g. Moskva.
(Deformations (Mechanics))

SOV/ 57-28-7-3/35

AUTHORS: Ryabinin, Yu. N., Livshits, L. D., Vereshchagin, L. F.

TITLE: On the Change of the Electric Conductivity of Silicon at Superhigh Pressure (K voprosu ob izmenenii elektroprovodnosti kremniya pod sverkhvysokim davleniyem)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol. 28, Nr 7, pp. 1382 - 1386 (USSR)

ABSTRACT: First it is shown that the results obtained by P.W.Bridgman (Refs 2 and 8) are not constant and, to a certain extent, uncertain. A measurement of the electric conductivity of silicon of the p-type in dependence on the pressure is repeated. A silicon monocrystal, produced according to the method of Chokhral'skiy at the State Institute of Rare Metals was used as sample. It had the form of a parallel epiped with 9,8 x 5,8 x 4,0 mm. A Wheatstone bridge of the type MK-49 was used for the measurement of the electric resistance. A multiplier (analogous to that of Bridgman) which was developed in the laboratory of the authors was used for the measurement of the sample resistance under high hydrostatic pressure. The measurements were

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started with the determination of the amount of the temperature factor of the electric resistance α at atmospheric pressure. They show that the sample resistance does not change in the case of an alteration of the current polarity and is independent of the amount of amperage in the region of 0,2 ÷ 10 mA . The specific sample resistance at 20° amounted to 18,4 ohm cm. The measurement of the sample resistance was carried out gradually up and down under pressure. It was found that the electric resistance of silicon is reduced with increasing pressure. It was shown that pure silicon of the p-type has the same effect sign as germanium of the p-type and selenium (Ref 2,5 resp.). No such great hysteresis of the silicon resistance by the pressure was observed as in the case of Bridgman. It is pointed out that the electric resistance in the case of silicon of the p-type is to a great extent influenced by the chemical purity, the composition of the admixture, the thermal and mechanical pretreatment. S. A. Ratenberg put the silicon crystal at the authors' disposal. N.I.Chetverikov helped to produce the contacts. There are 2 figures and 10 references, 3 of which are Soviet.

On the Change of the Electric Conductivity of Silicon at Superhigh Pressure

SOV/57-28-7-3/35

ASSOCIATION: Laboratoriya fiziki sverkhvysokikh davleniy AN SSSR Moskva (Laboratory of the Physics of Superhigh Pressures, AS USSR, Moscow)

SUBMITTED: October 2o, 1957

1. Silicon--Conductivity

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BERESNEV, B.I.; VERESHCHAGIN, L.F.; RYABININ, Yu.N.

Equipment for metal drawing and rolling in freely rotating rolls with liquids under high hydrostatic pressure. TSvet. met. 31 no.8:61-63 Ag '58. (MIRA 11:9)
(Drawing (Metalwork)) (Deformation (Mechanics))

5(4) SOV/76-32-10-3/39

AUTHORS: Markevich, A. M., Tamm, I. I., Ryabinin, Yu. N.

TITLE: The Formation of the Formaldehyde in an Adiabatic Compression of Methane-Oxygen Mixtures (Obrazovaniye formal'degida pri adiabaticheskom szhatii metano-kislorodnykh smesey)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 10, pp 2242-2246 (USSR)

ABSTRACT: The authors employed a method suggested already earlier (Ref 1). The methane used contained 1-2% of higher hydrocarbons. The most interesting part of the adiabatic cycle, within which the pressure increases to some hundreds and thousands of kg/cm^2, lasts only some ten-thousandths of a second. The velocity of the temperature change of the compressed gas is therefore also 10^6-10^7 degree/second, so that a rapid drop of temperature in the expansion of chemically active gas mixtures leads to a high degree of hardening (Ref 2); thus, the reaction may be fixed at an intermediate stage. In the paper by M. S. Furman and D. S. Tsiklis (Ref 7) the formation of formaldehyde in an adiabatic compression of methane-oxygen mixtures was qualita-

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tively determined. The present experiments show that the character of the reaction of the mixture depends first of all on the oxygen content. Mixtures with more than 15% O_2 ignite under the deposition of soot. It is characteristic that the ignition does not take place at the maximum pressure but a little later when the mixture has expanded. Only with an oxygen content of less than 15% was it possible to interrupt the reduction in order to obtain an intermediate product. The reaction products of the compression have an unpleasant, sharp smell and contain formaldehyde as well as other intermediate products which form an intense fog with air. At a low compression (300-350 kg/cm^2) and a low content of formaldehyde this formation of fog is not observed. In mixtures of natural gas and oxygen the formaldehyde formation begins at lower compressions than in pure methane, due to the increase of the oxygen content. The maximum content of formaldehyde (2,2%) is obtained at an oxygen content of 6 and 9%, and at a pressure of about 3000 kg/cm^2; it remains constant up to 7000 kg/cm^2. Mixtures with 12% O_2 have a different re-

The Formation of the Formaldehyde in an Adiabatic Compression of Methane-Oxygen Mixtures

action character. There are 6 figures, 1 table, and 9 references, 9 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva (Moscow, Institute of Chemical Physics, AS USSR)

SUBMITTED: November 28, 1956

SOV/3548

PHASE I BOOK EXPLOITATION

Ryabinin, Yuriy Nikolayevich

Gazy pri bol'shikh plotnostyakh i vysokikh temperaturakh (Gases at High Density and High Temperature) Moscow, Fizmatgiz, 1959. 71 p. (Series: Sovremennyye problemy fiziki) 5,000 copies printed.

Preface: L.F. Vereshchagin, Professor, Director of the Institute of Physics of High Pressures, Academy of Sciences USSR; Ed.: V.A. Grigorova; Tech. Ed.: S.S. Gavrilov.

PURPOSE: The booklet is intended for physicists and engineers studying the properties of gases under high pressures and at high temperatures. It may also be useful to chemists, since the method described can also be applied in studying the kinetics of chemical reactions occurring in gas mixtures at high temperatures.

COVERAGE: This is a publication in the series, "Contemporary Problems of Physics". The author describes a special unit in which gases were compressed by means of a piston "shoot" in a closed cylinder. The process of gas compression

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