GORBUNOV, M. A. and KOSHKIN, N. I.

"Absorption of Sound in the Region of Transition from Liquid to Crystals."

report presented at the 6th Sci. Conference on the Application of Ultrasound in the investigation of Matter, 3-7 Feb 1958, organized by Min. of Education RSFSR and Moscow Oblast Pedagogic Inst. im N. K. Krupskaya.

GORBUNOV, M. A.
NOZDREV, V. F., KOSHKIN, N. I., and GORBUNOV, M. A.

"Study of Physico-Chemical Properties of Complex Thermodynamical Systems by Ultrasonic Methods."

paper presented at 4th All-Union Conf. on Acoustics, Moscow, 26 May - 4 Jun 58.

NOZDREV, V.F.; YAKOVLEV, V.F.; KOSHKIN, N.I.; GORBUNOV, M.A.

Certain new possibilities for using ultrasonic pulses for investigating substances. Izv. vys. ucheb. zav.; radiotekh. no.1:35-42 '58. (MIRA 11:4)

1. Rekomendovana kafedroy obshchey fiziki Moskovskogo oblastnogo pedagogicheskogo instituta.
(Ultrasonics) (Liquids)

SOV/153-58-4-8/22

5(2,4)
AUTHORS: Gorbunov, M. A., Koshkin, N. I.

TITLE: Measurement of the Absorption of Ultra-Sonic Waves in Organic Liquids in the Transition Zone, Liquid-Crystal (Izmereniye pogloshcheniya ul'trazvukovykh voln v organicheskikh zhidkostyakh v oblasti perekhoda zhidkost'-kristall)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 49 - 54 (USSR)

ABSTRACT: The study of the properties of matter in the transition zone, liquid-crystal, is of particular importance today, especially in connection with the artificial growth of crystals for various industrial purposes, as well as for the production of pure substances. A survey of literature is given (Refs 1-10, 14-16). The problem mentioned in the title was, as far as the authors know, not investigated. The authors used the impulse -method for measurements in the transition zone. The main problem was to determine

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whether the impulse would penetrate the medium in the transition zone with low sound intensities: if not, the natural process of crystallization would be disturbed. (Refs 3,11). Eventually, the authors succeeded in constructing the chamber outlined in figure 1. The construction and functioning of this chamber are described. Tests were carried out with benzene (consolidation point $+5^{\circ}$) and its derivatives of various kinds: o-xylene, chlorobenzene, benzyl alcohol, and carbon tetrachloride. The latter served for comparisons since its molecular structure differs considerably from that of benzene and its derivatives. The authors refrain from entering into a theoretical discussion of the general problem of transition between liquids and solids and confine themselves to a discussion of the results of measurements of the absorption in benzene and benzyl alcohol. It follows from the results obtained that: 1) there coexist in the transition zone 2 modifications which

are in static equilibrium; this fact also seems to determine the presence of an absorption maximum, its position and width. b) The transition does not take place at a certain temperature, but within a range of temperature determined by the structural properties of the substance. There are 3 figures and 16 references, 13 of which are Soviet.

ASSOCIATION: Moskovskiy oblastnoy pedagogicheskiy institut (Moscow Oblast Pedagogical Institute)Kafedra obshchey fiziki (Chair of General Physics)

SUBMITTED: October 12, 1957

SOV/124-59-9-9840

Translation from: Referativnyy zhurnal, Mekhanika, 1959, Nr 9, p 38 (USSR)

AUTHORS: Koshkin, N.I., Gorbunov, M.A. [redacted]

TITLE: A Method Worked out for Measuring the Absorption of Supersonic Waves in the Liquid-Solid Transition Range

PERIODICAL: V sb.: Primeneniye ul'traakust. k issled. veshchestva. Nr 6, Moscow, 1958, pp 199 - 208

ABSTRACT: The authors describe different variants of the pulse method for studying the supersonic absorption (frequency of the order of 10^6 cps) by liquids at temperatures being close to the crystallization temperature. The conditions, which must be fulfilled for applying the pulse method to investigating the properties of matter within the transition range between liquid and solid crystalline state, are formulated: 1) application of a solid acoustic delay line; 2) using two quartz converters for reducing the acoustic range; 3) operation within millimeter distances. A glassy measuring chamber is described, which provides for the following properties: a) uniformity of the crystallization process over the entire volume

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A Method Worked out for Measuring the Absorption of Supersonic Waves in the Liquid-Solid Transition Range

of the chamber; b) possibility of a direct observation of the course of a process; c) exclusion of possible chemical interactions between the investigated liquid and the chamber walls. The authors recommend to record two series of measurements with different distances between the radiating and receiving quartzes. It is necessary to record also the initial value of the sounding pulse equal for the two measurement series. The measurements must be carried out at temperatures different from the crystallization temperature by 1 - 1.5°C. The results from measuring the sound absorption coefficient of benzol at a frequency of 6.35 Mc within the temperature range from 4 to 8°C are presented graphically. Bibl. 12 titles.

B.B. Kudryavtsev

GORBUNOV, M.A.

PHASE I BOOK EXPLOITATION SOV/4342

Vserossiyskaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov.

Primeneniye ul'traakustiki k issledovaniyu veshchestva; trudy konferentsiy, vyp. 9 (Application of Ultrasonics in the Study of Substances, No. 9) Moscow, Izd. MOPI, 1959. 245 p. Errata slip inserted. 1,000 copies printed.

Eds.: V. F. Nozdrev, Professor, and B. B. Kudryavtsev, Professor.

PURPOSE: This collection of articles is intended for scientists specializing in ultrasonics, and for those interested in the application of ultrasonics to the study of the properties of materials, and to the quality control of machined parts and structural elements.

COVERAGE: The collection constitutes the transactions of the All-Russian Conference of Professors and Teachers of Pedagogical Institutes. The articles report on recent theoretical and experimental investigations in the field of ultrasonics and discuss the application of ultrasonics to the study of

Card 1/7

Application of Ultrasonics (Cont.) SOV/4342

[illegible], A. V. and L. G. Melkonyan [Yerevanskiy politekhn. in-t (Yerevan Polytechnical Institute)]. Dependence of Speed of Ultrasound and Certain Physicochemical Properties of Liquid Binary Systems on Their Composition and Temperature	71
[illegible], N. F. [Kursk Pedagogical Institute]. Speed of Ultrasound with Near-Solidification Temperatures in Certain Organic Substances	83
Gorbunov, M. A. [Moscow Oblast' Pedagogical Institute imeni Krupskaya]. Measurement of Absorption of Ultrasonic Waves in Organic Liquids in the Liquid-Crystal Transition Region	95
[illegible], A. V. and B. B. Kudryavtsev, [Moscow Oblast' Pedagogical Institute imeni Krupskaya]. Investigation of the Behavior of Cavitation Bubbles	107
Maksimov, Ya. S. [Yaroslavsk. ped. in-t (Yaroslavl' Pedagogical Institute)]. Problem of the Relaxation Mechanism in Butyl Acetate	117

Application of Ultrasonics (Cont.) SOV/4342

Kapustin, A. P. [Mosk. Ped. in-t imeni Lenina (Moscow Pedagogical Institute imeni Lenin)]. Etch-Figures in Terpine Monohydrate Crystals	125
Kapustin, A. P. and V. Ye. Kavalyunayte [Moscow Pedagogical Institute imeni Lenin and In-t kristall. AN SSSR (Institute of Crystallography of the Academy of Sciences, USSR)]. Effect of the Vibration of Vessel Walls on Crystallization in Thin Layers	127
Kirenskiy, L. V., A. I. Drokin, and V. S. Cherkashin [Krasnoyarsk. ped. in-t (Krasnoyarsk Pedagogical Institute), Krasnoyarsk. in-t fiziki AN SSSR (Krasnoyarsk Institute of Physics of the Academy of Sciences, USSR)]. Effect of Ultrasound on the Magnetic Properties of Ferromagnetics	131
Kudryavtsev, B. B., A. N. Medvedev, and A. P. Ponomarev [Moscow Oblast' Pedagogical Institute imeni Krupskaya]. Effect of Ultrasound on the Luminescence of Phosphors	139
[illegible], N. I., and M. A. Gorbunov [Moscow Oblast' Pedagogical Institute imeni Krupskaya]. Investigation of the Liquid - Solid System by the Ultrasonic Method	197

Gorbunov M.A.

USSR (cont'd)

NIKITAEV, B. B., and BALYAN, S. A., Laboratory for Molecular Acoustics, Moscow Oblast Institute for Pedagogics - "The relationship between viscosity and velocity of sound in a liquid"

MALAROV, V. I., and MIKHVKIN, S. N., State University of Moscow - "Study of sound dispersion in solid bodies, plates, and shells by means of an optical process in a dark field"

MALYUZHINETS, G. D., Acoustics Institute, USSR Academy of Sciences, Moscow - (1) "The Sommerfeld integrals and curve tasks in cuneate areas"; (2) "Development of curve phenomena presentations"

NEMILOV, L. G., Leningrad Electrical Engineering Institute im. V. I. Ulyanov-Lenin - "Absorption of ultra-short waves with frequencies of up to 1000 MHz in crystals"

NAUGOL'NYKH, K. A., and ROMANENKO, E. V., Acoustics Institute, USSR Academy of Sciences, Moscow - "The propagation of spherical and cylindrical waves of finite amplitude"

NOZDREV, V. F., Laboratory for Molecular Acoustics, Moscow Oblast Institute for Pedagogics - "Physical bases for the technical application of molecular acoustics of small amplitudes"

NOZDREV, V. F., BELINSKAYA, L. G., and BELINSKIY, B. A. - "Study of supersonic wave absorption in the esters of acetic acid at high frequencies"

NOZDREV, V. F., MAL'YANOV, B. K., and SHIRKEVICH, M. G. - "Studies of supersonic wave absorption in liquids at high temperatures and pressures"

NOZDREV, V. F., KOSHKIN, N. I., and GORBUNOV, M. A. - "Study of the system of liquid-proof bodies by means of ultra-acoustical methods"

NOZDREV, V. F., YAKOVLEV, V. F., PEREPECHKO, Yu. G., and SHIRKEVICH, A. A. - "Dispersion of ultrasonic sound in thin gases"

POLYAKOVA, A. L., Acoustics Institute, USSR Academy of Sciences, Moscow - "Absorption of ultimate amplitude sound waves in relaxing media"

RIMSKIY-KORSAKOV, A. V., Acoustics Institute, USSR Academy of Sciences, Moscow - "Statistical properties of broad-casting signals"

ROY, N. A., and FROLOV, D. P., Acoustics Institute, USSR Academy of Sciences, Moscow - *

ROZENBERG, L. D., Acoustics Institute, USSR Academy of Sciences, Moscow - "Studies of the physical processes in industrial applications of supersonic sound"

SAMOYLOVA, I. K., Sechenov Institute of Evolutionary Physiology, USSR Academy of Sciences, Leningrad - "Preceding masking of short tone signals"

SLAVIN, I. I., and ILYASHUK, Yu. M., Laboratory for Combating Noise, Institute for Labor Protection, Leningrad - "The Soviet system of standards for industrial noise and the Soviet Union's experiences with the system"

Hungary

[illegible], D., Szekesfehervar - "Contribution to the theory of sound radiation"

SZILARD, J., Budapest - "Ultrasound intensity measurement by compensated calorimeter"

Poland

KUCZERA, F., OPILSKI, A., and SZIMA, S., Chair of Physics, Higher School of Agriculture, Olsztyn - "Concerning a new acoustic method of determining intermediate molecular forces in liquids and liquid mixtures"

Germany (Democratic Republic)

JACOB, K. P., Institute for Theoretical Physics, University of Rostock - "The significance of sound velocity measurements for the physics of ternary solutions"

* "Generation of sound by spark discharges in water"

1-8 Sep 1959

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000516110016-0"

GORBUNOV, M. A., Cand Phys-Math Sci -- (diss) "Research into the absorption of ultrasonic waves in the area of transition of liquid-crystal organic substances." Moscow, 1960. 10 pp; (Ministry of Education RSFSR, Moscow Oblast' Pedagogical Inst im N. K. Krupskaya); 200 copies; price not given; (KL, 24-60, 127)

GORBUNOV, M.A. AND NOZDREV, V.F.

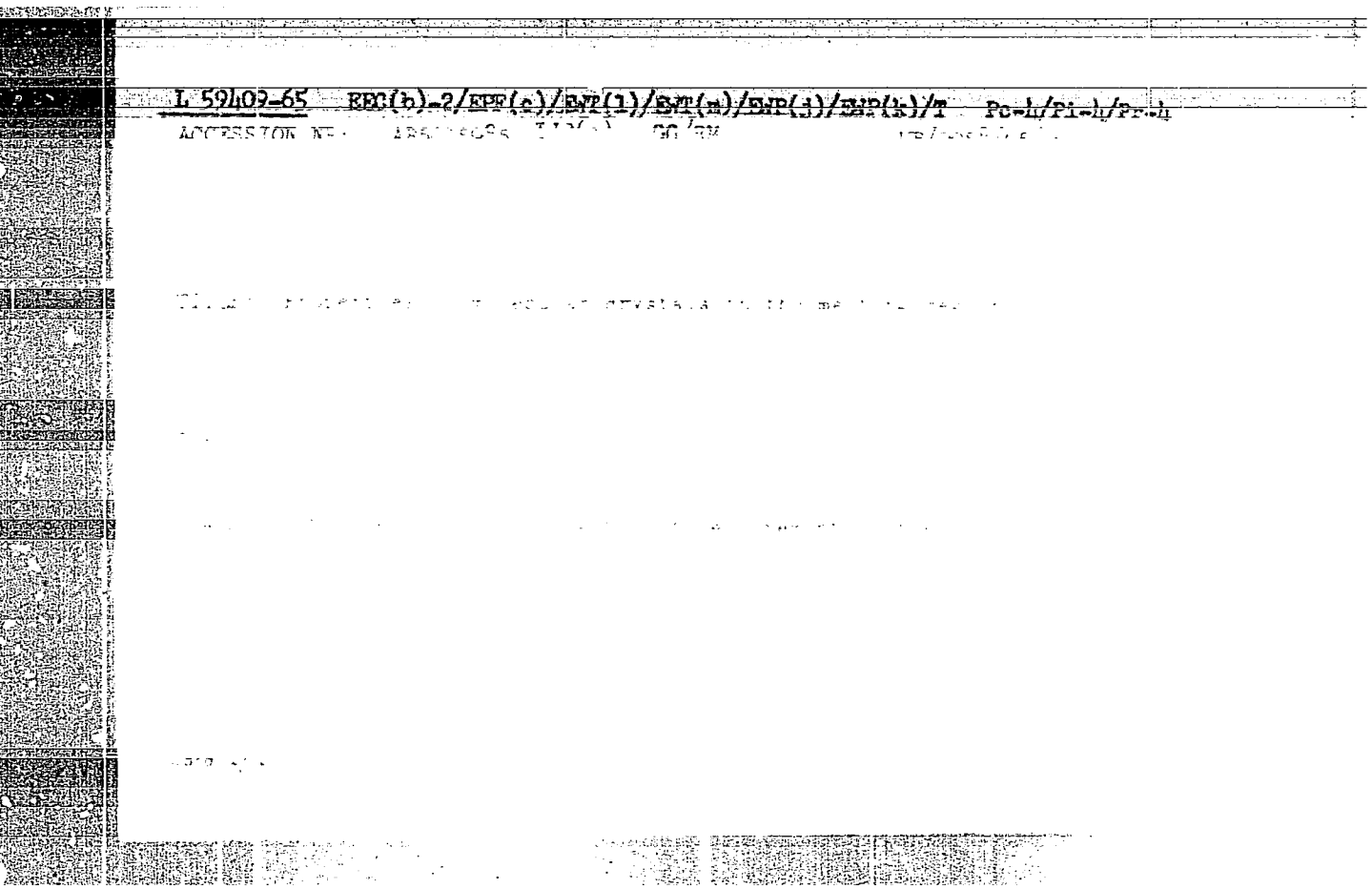
"Untersuchung der absorption der ultraschalls
auf dem schemelzungsgebet der molekularen crystal.

Paper presented at Fourth Intl. Congress on Acoutics.
Copenhagen, 21-28 Aug 1962

GORBUNOV, M.A.; KOSMYNIN, N.I.

Ultrasound absorption in the transition region liquid - polycrystalline benzene. Prim. ul'traakust. k issl. veshch. no.13:241-250 '61. (MIRA 16:6)

(Benzene--Acoustic properties)
(Absorption of sound)



L 32951-66 EWT(m)/EWP(t)/ETI IJP(c) GW

ACC NR: AR6016271 SOURCE CODE: UR/0058/65/000/011/E063/E063

AUTHOR: Koshkin, N. I.; Gorbunov, M. A.; Dmitriyeva, N. A. 57

TITLE: Investigation of acoustic properties of polymers by a pulse method 53

SOURCE: Ref. zh. Fizika, Abs. 11Zh435

REF SOURCE: Sb. Primeneniye ul'traakust. k issled. veshchestva. Vyp. 20, M., 1964, 47-53

TOPIC TAGS: ultrasound absorption, acoustic speed, epoxy plastic, rubber, butyl rubber, acoustic measurement, thermostat, ACOUSTIC PROPERTY

ABSTRACT: The speed and absorption of ultrasound were measured at frequencies 500 kcs - 10 Mcs in the following polymer materials: polybutylmethacrylate, compounds based on epoxy resin or the product of copolymerization of butylmethacrylate with dimethylacrylate-triethyline glycol, and rubber in the temperature range -60 - +60C. A block diagram of the pulse apparatus is given. The speed measurement was based on the relative displacement of the first half-wave on the oscilloscope screen for two samples made of the same material but having different lengths. In determining the absorption, the amplitudes of the first half-wave were compared after passage through samples of different lengths of the given material. The method of multiple reflections was also used. A schematic diagram of the measuring chamber is presented. The entire system was immersed in a Dewar vessel filled with a liquid which did not react with the investigated polymer. To obtain low temperatures, refrigerating apparatus was used in

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L 32991-66

ACC NR: AR6016271

conjunction with an ultrathermostat of the "Vobzer" type (accuracy 0.05C). Curves showing the dependence of α and of the ultrasound velocity on the temperature at 830 and 980 kcs and at 2 Mcs were obtained. The temperature at which the temperature coefficients of the velocity change, exhibit no reciprocal proportionality to the temperature within the limits of experimental accuracy (1%) in the interval 800 kcs - 2 Mcs. The ultrasound speed in rubber decreases rapidly in the interval -40 - 10C, while the absorption in the region -30 - 20C passes through a maximum (transition from the highly-elastic into the glass-like state). At higher frequencies, the absorption maximum shifts toward lower temperatures. I. Nikolayeva. [Translation of abstract]

SUB CODE: 20

Card 2/2 pld

L 33750-66 EWT(d)/EWT(m)/EWP(f)/EWP(c)/EWP(v)/T/EWP(t)/ETI/EWP(k)/EWP(1)
ACC NR: AR6017322 SOURCE CODE: UR/0273/66/000/001/0018/0018
IJP(c) JD/JH (A)

AUTHOR: Gorbunov, M. S.; Burkov, V. V. 14

TITLE: Engineering economic effectiveness of adopting aluminum radiators 42 B

SOURCE: Ref. sh. Dvigateli vnutrennego sgoraniya, Abs, 1.39.130

REF SOURCE: Zap. Leningr. s.-kh. in-ta, v. 97, 1965, 205-217

TOPIC TAGS: aluminum, engine radiator

ABSTRACT: The adoption by industry of aluminum 21 sectioned radiators manufactured directly from the melt or from alloyed rolled products was found to be economically feasible. Moreover, it economizes large amounts of such critical materials as copper, lead and tin, and has other advantages in the manufacture, use and repair of radiators. The estimated yearly savings to the USSR from the adoptation of sectioned aluminum radiators will be about 35 million rubles. The 200,000 to 250,000 rubles needed as investment to manufacture copper radiators accounts for favorable depreciation of the aluminum radiator producing installation. The manufacture of soldered aluminum radiators of the NK-120 type and the tubing-ribbed aluminum radiators is unprofitable.

SUB CODE: 13, 11/ SUBM DATE: none

Card 1/1 BLG

L 45173-66 EWT(1)/EWT(m)/EWP(j) IJP(c) WW/RM
ACC NR: AR6023279 SOURCE CODE: UR/0058/66/000/003/E007/E007

56
B

AUTHOR: Gorbunov, M. A.; Makhmudov, A. U.

ORG: none

TITLE: Investigation by the pulse method of acoustic properties of benzene in transition from crystal to liquid

SOURCE: Ref. zh. Fizika, Abs. 3E49

REF SOURCE: Tr. 1-y Mezhvuz. nauchn. konferentsii po primeneniyu molekul. akust. k issled. veshchestva i v nar. kh-ve. Tashkent, 1964, 77-84

TOPIC TAGS: acoustic property, benzene, ultrasound absorption, temperature dependence, frequency band, pulse method, crystal liquid transition

ABSTRACT: Ultrasound absorption has been measured in crystalline and liquid benzene at a frequency of 15.1 Mc. It was found that up to 5.3C the absorption depends little on temperature but at higher temperatures absorption dependency increases sharply up to the values characteristic of the liquid phase. The role of

Card 1/2

L 45173-66
ACC NR: AR6023279 0

diffuse scattering of ultrasound at the crystalline grain boundaries is discussed. The procedure of preparing samples is described. [Translation of abstract] [NT]

SUB CODE: 20/

Card 2/2 fda

GNOYEVOY, P.S., inzh.; NOVIKOV, V.G., inzh.; GORBUNOV, M.A., inzh.; KONAREVSKIY, A.A., inzh.; BESSTRASHNOVA, G.M., mladshiy nauchnyy sotrudnik; GINZBURG, O.M., mladshiy nauchnyy sotrudnik; SKOBELEV, M.V., mladshiy nauchnyy sotrudnik

Experimental unit for studying the thermal and humidifying processes in sausage production. Trudy VNIIMP no.12:104-111 '64. (MIRA 18:2)

GORBUNOV, M.D.

The "Okun'" fish-locating echo sounder. Biul.tekh.-ekon.inform. no.10:45-46 '60. (MIRA 13:10)
(Sonar in fishing)

GORBUNOV, M.D.

Fish-searching sounding device "Del'fin 1." Biul.tekh.-ekon. inform. no.7:69-70 '61. (MIRA 14:8)
(Fish processing plants)

GORBUNOV M.F.

ARTEM'YEV, Yu.N., kandidat tekhnicheskikh nauk; ALEKSEYEV, I.A., inzhener; ASTVATSATUROV, G.G., inzhener; BISNOVATYY, S.I., inzhener; BONDARENKO, A.F., inzhener; GURAL'NIK, Ye.L., inzhener; GORBUNOV, M.F., inzhener; ZLATKOVSKIY, A.P., kandidat tekhnicheskikh nauk; KATTS, N.V., inzhener, KITAYEV, A.S., inzhener; KOZLOV, A.M., inzhener; LEONOV, P.T., inzhener; LIVSHITS, L.G., kandidat tekhnicheskikh nauk; LIBERMAN, A.R., inzhener; LINNIK, Ye.M., inzhener; LUKANOV, M.A., inzhener; MOROZOV, S.A., inzhener; POGORELYY, I.P., kandidat tekhnicheskikh nauk; PETROV, S.A., kandidat tekhnicheskikh nauk; PYATETSKIY, B.G., inzhener; RABOCHIY, L.G., kandidat tekhnicheskikh nauk; SELIVANOV, A.I., kandidat tekhnicheskikh nauk; FERBERG, B.S., kandidat tekhnicheskikh nauk; CHISTYAKOV, V.D., inzhener; CHUNIKHIN, V.M., inzhener; SHIRYAYEV, A.I., inzhener; SHCHUPAK, A.D., inzhener; KUCHUMOV, P.S., inzhener, redaktor; PETROV, S.A.; PESTRYAKOV, A.I., redaktor; BALLOD, A.I., tekhnicheskiy redaktor.

[Handbook of equipment for repairing tractors and agricultural machinery] Spravochnik po oborudovaniiu dlia remonta traktorov i sel'skokhoziaistvennykh mashin. Moskva, Gos. izd-vo selkhoz. lit-ry, 1954. 646 p. (MLRA 7:11)

(Tractors--Repairing) (Agricultural machinery--Maintenance and repair)

GORBUNOV, M. G.

Author: Gorbunov, M.G.

Title: Age of the tertiary flora at Kirnevskoe on the OB.

Journal: Doklady Akademii Nauk SSSR, 1951, Vol.77, No.1, p. 101

Subject: Palaeontology

From: D.S.I.R. Oct 51

GORBUNOV, M. G.

USSR/ Geology - Paleontology

Card : 1/1

Authors : Gorbunov, M. G.

Title : Grape seeds from iliocene deposits found downstream of the Chulym River in Western Siberia

Periodical : Dokl. AN SSSR, 97, Ed. 3, 527 - 530, July 21, 1954

Abstract : Scientific data are given on grape seeds extracted from ilicoene deposits taken from the Chulim River in Western Siberia. Sixteen references. Drawings.

Institution : The V. V. Kuybyshev State University, Paleontological Museum, Tomsk

Presented by : Academician, V. N. Sukachev, May 17, 1954

GORBUNOV, M. G.

USSR/Geology - Tertiary flora

Card 1/1 : Pub. 22 - 30/44

Authors : Gorbunov, M. G., and Shatskiy, S. B.

Title : Stratigraphic position of tertiary flora (Kompasskiy Forest) on the Tim River (Western Siberia)

Periodical : Dok. AN SSSR 97/6, 1049-1052, Aug 21, 1954

Abstract : Map showing the stratigraphic position of tertiary flora on the Kompasskiy forest on the River Tim in Western Siberia, is presented. The material on the largest resources of Tertiary era plants, was gathered in 1952 by the West Siberia Geological Society. Twelve USSR references (1883-1952).

Institution : .....

Presented by: Academician V. A. Obruchev, May 31, 1954

AKSARIN,A.V.; ANAN'YEV,A.P.; BENEDIKTOVA,R.N.; GORBUNOV,M.G.; GRATSIANOVA, R.T.; YEGOROVA,L.I.; IVANIYA,V.A.; KRAYEVSKAYA,L.N.; KRASNOPEYEVA, P.S.; LEBEDEV,I.V.; LOMOVITSKAYA,M.P.; POLETAYEVA,O.K.; ROGOZIN,L.A.; RADCHENKO,G.P.; RZHONSNITSKAYA,M.A.; SIVOV,A.G.; FOMICHEV,V.D.; KHALFINA,V.K.; KHALFIN,L.L.; CHERNYSHEVA,S.V.; NIKITINA,V.N., redaktor; GUROVA,O.A., tekhnicheskiy redaktor

[Atlas of leading forms of fossils in the fauna and flora of Western Siberia] Atlas rukovodiashchikh form iskopaemykh fauny i flory zapadnoi sibiri. Pod red. L.L.Khalfina. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po geologii i okhrane nedr, Vol.1. 1955. 498 p. Vol.2. 1955. 318 p. [Microfilm] (MLRA 9:3)

1. Tomsk. Politekhnicheskiy institut imeni Kirova.
(Siberia, Western--Paleontology)

GORBUNOV, M.G., BARKALOV, I.A.

On the stratigraphy of Tertiary flora in the Ob valley near Tomsk.
Dokl. AN SSSR 105 no.5:1062-1065 D '55. (MLRA 9:3)

1. Predstavlene akademikom D.I. Shcherbakovym.
(Ob valley--Geology, Stratigraphic)

GORBUNOV, M[redacted]

New Juglans species from Tertiary deposits of Western Siberia.
Bot.zhur. 41 no.5:653-666 My '56. (MLRA 10:7)

1. Tomskiy gosudarstvennyy universitet.
(Siberia, Western--Walnut, Fossil)

GORBUNOV, M.G.

Tertiary pines in Western Siberia [with summary in English]. Bot.zhur. 43 no.3:337-352 Mr '58. (MIRA 11:5)

1. Tomskiy gosudarstvennyy universitet.
(Siberia, Western--Pine, Fossil)

3(5),17(4)

AUTHOR: Gorbunov, M. G.

SOV/20-128-3-48/58

TITLE: On Residues of Fruit of the Apple Tree (Pirus Malus) From Tertiary Deposits in West Siberia

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 3, pp 607-610 (USSR)

ABSTRACT: The disclosure of Zaobskiy Yar (on the branch of the river Ob', 6 km south of the village of Kozhevnikovo) is, according to investigations by P. A. Nikitin (Ref 3), one of the most abundant disclosures with respect to discoveries of Tertiary plant seed and -fruit (Fig 1). This disclosure is stratigraphically divided into 2 unequally thick halves. On the foot of the steep wall, up to 6-9 m high above the river level, Tertiary sediments are deposited which are covered by a Quaternary mass up to 36 m thick. The Tertiary sediments belong to 2 horizons. Siderite nuclei of fresh-water mollusks were found in the lower horizon (determinations by A. G. Eberzin, Ref 1). An intermediate layer of sandy loam, 0.5 m thick, was found in the loam of the same horizon. It contains numerous plant remains in the form of detritus, seed, fruit, wood, and leaf remains. P. A. Nikitin washed out and determined 118 species of

plants from these remains. In his opinion, this loam mass is of Pliocene age. The author considers the flora one of the habitats of the Kireyevskiy type which he assigns to the Lower Pliocene (Ref 1). In T. A. Yakubovskaya's opinion (Ref 4), these deposits are of Miocene age. The author found and described - from the plant detritus - endocarpia of Juglans cinerea L. fossilis Bronn (according to Ref 7), numerous cones of Sequoia Langsdorfii (Brogn.), as well as some cones of Metasequoia disticha (Heer) Miki (Ref 6). Among the undescribed plant remains, some large fruits are interesting which the author now assigns to the genus of Malus Miller (family of rosaceae). Also leaves of this genus are seldom in the fossil state, fruits seem to be wholly unknown (Ref 7). Here follows a description of the new species: Malus obensis Gorbunov sp. n. (Fig 2). These fruits are similar to those from the Japanese Pliocene (Ref 8), namely the presumable Carya akashiana Miki. The author was also mistaken before when he described the apples under discussion as Carya (Ref 1). Also Miki (Ref 9) has now assigned his C. akashiana to the family of rosaceae (as Chaenomeles japonica (Thunb.) Lindl.). A comparison of the fruit of

On Residues of Fruit of the Apple Tree (Pirus Malus) From Tertiary Deposits in West Siberia

SOV/20-128-3-48/58

M. obensis with that of recent species is difficult due to the poorly characteristic aspect. With respect to the size of the fruit, the species of M. obensis is next to the species of Malus Sieversii (Ldb.) M. Roem from Soviet Central Asia. M. Sieversi rises up to the Tarbogatay Chain (Ref 10) in the north. At present, there is no recent species of Malus in the West-Siberian flora. The rather large fruit of M. obensis suggests a favorable climate in the beginning Pliocene in the respective area. There are 2 figures and 10 references, 6 of which are Soviet.

ASSOCIATION: Tomskiy gosudarstvennyy universitet im. V. V. Kuybysheva (Tomsk State University imeni V. V. Kuybyshev)

PRESENTED: June 1, 1959, by V. N. Sukachev, Academician

SUBMITTED: May 29, 1959

Card 3/3

GORBUNOV, M.G.

Contribution to the study of the Yaya horizon of siliceous rocks in Western Siberia. Dokl.AN SSSR 133 no.2:427-430 Jl '60. (MIRA 13:7)

1. Tomskiy gosudarstvennyy universitet imeni V.V.Kuybysheva. Predstavleno akademikom A.A.Trofimukom.
(Yaya Valley--Geology, Stratigraphic)

GORBUNOV, M.G.

Find of fossil nut near Antropovo on the River Tavda. Dokl. AN SSSR 155 no. 4:814-817 Ap '64. (MIRA 17:5)

1. Tomskiy gosudarstvennyy universitet im. V.V.Kuybysheva. Predstavleno akademikom V.N.Sukachevym.

KHALFIN, L.O., prof., otv. red.; IVANIYA, V.A., dots., kand. geol.-miner. nauk, red. toma; BAZHENOV, I.K., prof., red.; BULYNNIKOV, A.Ya., prof., red.; GORBUNOV, M.G., dots., kand. geol.-miner. nauk, red.; KUZ'MIN, A.M., prof., red.; MIKOV, D.S., prof., red.; ROGOV, G.M., dots., kand. geol.-miner. nauk, red.; SULAKSHIN, S.S., dots., kand. tekhn. nauk, red.; KHAKHLOV, V.A., prof., red.

[Materials on the geology and minerals of Western Siberia; reports] Materialy po geologii i poleznym iskopaemym Zapadnoi Sibiri; doklady. Tomsk, Izd-vo Tomskogo univ., 1964. 424 p. (MIRA 18:3)

1. Konferentsiya, posvyashchennaya 100-letiyu so dnya rozhdeniya akademika M.A.Usova, Tomsk, 1963.

L 34972-66 EWT(1) GW

ACC NR: AP6021223 SOURCE CODE: UR/0210/66/000/004/0099/0106

22
B

AUTHOR: Gorbunov, M. G.; Pospelova, G. A.

ORG: Tomsk State University (Tomskiy gosudarstvennyy universitet); Institute of Geology and Geophysics, Siberian Department, AN SSSR (Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR)

TITLE: Paleomagnetic investigations in the Lower Miocene lake clays of the Tym River (Western Siberia)

SOURCE: Geologiya i geofizika, no. 4, 1966, 99-106

TOPIC TAGS: paleomagnetism, ~~Upper Oligocene~~, ~~Lower Miocene~~, magnetic declination, magnetic inclination, ~~remanent~~ magnetization, ~~viscous magnetization~~

ABSTRACT: Paleomagnetic investigations have been carried out on lake clays taken from the banks of the River Tym in Belyy Yar in the Kompasskiy Bor region in Northwest Siberia. The clay was lens-shaped and belonged to the Upper Oligocene. Nine patterns were taken from various places in the lens. Patterns were studied in the laboratory of the Institute of Geology and Geophysics of the Siberian Department of the Academy of Sciences of the USSR. Patterns taken from the middle of the lens had weak magnetization and those taken from the upper part had stronger magnetization. Magnetization of all patterns was inverse to the present state of the earth's field.

Card 1/2 UDC: 550.382.3(571.16)

L 34972-66
ACC NR: AP6021223

Magnetic declination of all patterns was 194.5° and the mean inclination -62°, since the present declination of the magnetic field is 14° and the inclination +77°. The stability of the remanent magnetization was determined by the demagnetizing alternating field. The demagnetizing field varied from 12 to 28 oe in the patterns, which indicates magnetization metastability. The viscous magnetization was determined from the difference in the remanent magnetization after the action of the earth's field in the direction of the magnetization and against it. A fast restoration of magnetization after demagnetization in a constant field and great viscous magnetization indicate that rocks cannot be considered to resist temporary magnetization in the earth's field and that viscous magnetization easily appears in rocks and vanishes rapidly. The speed of increase of viscous magnetization rapidly diminishes and its maximum is less than that of the initial magnetization. The position of the pole at the time when these sediments were deposited was computed from the declination and inclination and was found to be at $\lambda = 230°E$ and $\phi = 70°N$. These coordinates agree with the migration curve of the pole. The polarity of the geomagnetic field then was opposite in comparison to the present field. Computations based on the remanent magnetization show that the region of Kompasskiy Bor was at the paleolatitude of 42°. The difference between that and the present latitude is 18°. These results may be considered as new data on the history of geomagnetic field. Orig. art. has: 3 figures. [EG]

SUB CODE: 08/ SUBM DATE: 21Aug65/ ORIG REF: 008/ ATD PRESS: 5029

Card 2/2 JS

GORBUNOV, N.I., inzhener.

From the work experience of the Hungarian furniture industry. Der. prom. 5 no.8:26-27 Ag '56. (MLRA 9:10)
(Hungary--Furniture industry)

GORBUNOV, N.I., inzhener.

Fixing rear panels without frames. Der.prom.5 no.12:22-23 D '56.
(MIRA 10:1)

(Furniture industry)

GORBUNOV, Nikolay Ivanovich

GORBUNOV, Nikolay Ivanovich, inzh.; SLUTSKIY, S.B., red.; SARMATSKAYA,G.I., red.izdatel'stva; BRATISHKO, L.V., tekhn.red.

[Selection of veneer for facing furniture] Podbor fanery dlia oblitsovki mebeli. Moskva, Goslesbumizdat, 1957. 94 p. (MIRA 10:12)
(Veneers and veneering)

GORBUNOV, N.I., inzh.

Finishing furniture in Hungarian enterprises. Der.prom. 7 no.3:30 Mr '58. (MIRA 11:4)
(Hungary--Furniture) (Hungary--Wood finishing)

GORBUNOV, N.I., inzh.

Chests and half-chests made of glued plywood. Der. prom. 7 no.7:20-21 Jl '58. (MIRA 11:8)

1. Proyektno-konstruktorskoye byuro Mosobldrevmebel'proma.
(Plywood)
(Containers)

GORBUNOV, N.I., insh.

Selecting plywood for facing furniture. Der.prom. 8 no.4:25 Ap '59. (MIRA 12:6)
(Plywood) (Furniture industry)

GORBUNOV, N.I.

Manufacture of veneer sheets from wood shavings for furniture manufacture. Der. prom. 8 no.11:21-22 N '59. (MIRA 13:3)

(Veneers and veneering)

GORBUNOV, N.I., inzh.

Paste for removal of oil during polishing. Der.prom. 9 no.3:18 Mr '60. (MIRA 13:6)

1. Moskovskaya mebel'naya fabrika "Lyuks".
(Grinding and polishing)
(Moscow--Furniture industry--Equipment and supplies)

ANTIPOV-KARATAYEV, I.N., akademik, otv.red.; TYURIN, I.V., glavnyy red.; GORBUNOV, N.I., red.; VERIGINA, K.V., red.; ZONN, S.V., red.; IVANOVA, Ye.N., red.; KEDROV-ZIKHMAN, O.K., red.; KONONOVA, M.M., red.; LOBOVA, Ye.V., red.; MISHUSTIN, Ye.N., red.; RODE, A.A., red.; ROZANOV, A.N., red.; SOKOLOV, A.V., red.; FRIDLAND, V.M., red.; SHUVALOV, S.A., red.; YEFIMOV, A.L., red.izd-va; MAKUNI, Ye.V., tekhn.red.

[Reports of Soviet soil scientists to the 7th International Congress in the U.S.A.] Doklady sovetskikh pochvovedov k VII Mezhdunarodnomu kongressu v SShA. Moskva, Izd-vo Akad.nauk SSSR, 1960. 487 p. (MIRA 13:10)

1. International Congress of Soil Science. 7th. 2. AN Tadzhikskoy SSR (for Antipov-Karatayev). 3. Pochvennyy institut im. V.V. Dokuchayeva Akademii nauk SSSR, Moskva (for Antipov-Karatayev, Gorbunov.

(Continued on next card)

ANTIPOV-KARATAYEV, I.N.---(continued) Card 2.
Ivanova,,Kononova, Rozanov,,Fridland, Sokolov).. 4. Laboratoriya lesovedeniya Akademii nauk SSSR, Moskva (for Zonn). 5. Vsesoyuznyy nauchno-issledovatel'skiy institut udobreniy i agropochvovedeniya Vsesoyuznoy ordena Lenina Akademii sel'skokhoz.nauk imeni V.I.Lenina i Institut zemledeliya akademii sel'skokhoz.nauk Belorusskoy SSR (for Kedrov-Zikhman). 6. Institut mikrobiologii Akademii nauk SSSR, Moskva (for Mishustin). 7. Nauchnyy institut po udobreniyam i insektofungitsidam im. Ya.V.Samoylova, Moskva (for Sokolov).
(Soil research)

GORBUNOV, N.I., inzh.

Attachment for prefilling pressing of the wood particle mass.
Der.prom. 10 no.11:23 N '61. (MIRA 14:10)

1. Mebel'naya fabrika "Lyuks", Moskva.
(Wood, Compressed)

KOZHEKOV, Dzholdoshbek; GORBUNOV, N.I., doktor sel'khoz. nauk, prof., otv. red.; BUTENKO, N.P., red.izd-va; POPOVA, M.G., tekhn. red.

[Soils of spruce and juniper forests in Kirghizistan, their chemical and mineralogical composition and properties] Pochvy elovykh i archovykh lesov Kirgizii, ikh khimiko-mineralogicheskii sostav i svoistva. Frunze, Izd-vo AN Kirg.SSR, 1963. 147 p. (MIRA 17:1)

1. Zaveduyushchiy laboratoriyey mineralogii pochv Pochvennogo instituta im. V.V.Dokuchayeva (for Gorbunov).

GORBUNOV, N.I.; PRUSINKEVICH, Z.; GRADUSOV, B.P.

Formation of clayey minerals in Podzolic soils on sandy rocks of various ages. Pochvovedenie no.8:48-57 Ag '63. (MIRA 16:9)

1. Pochvennyy institut imeni V.V.Dokuchayeva.

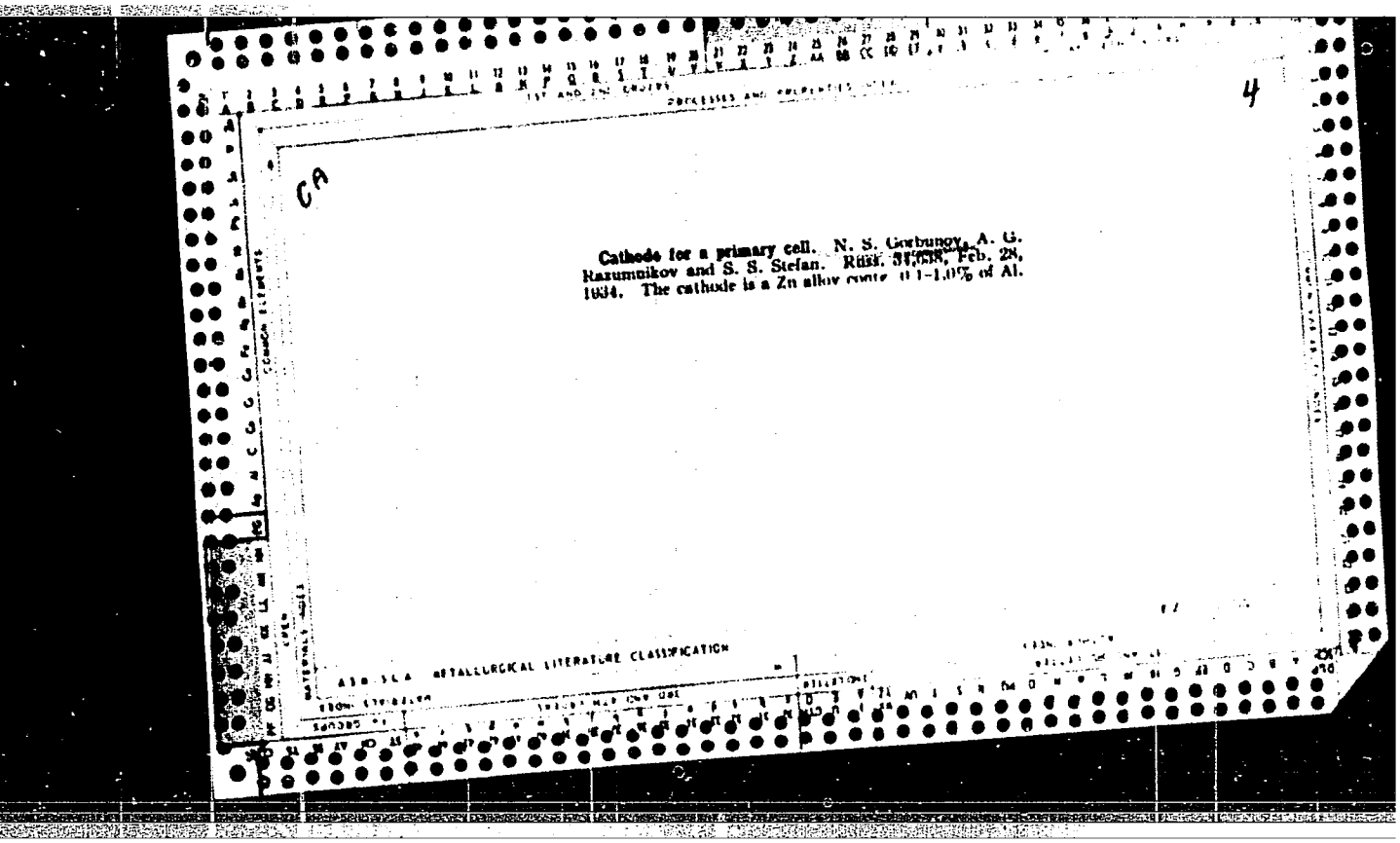
GORBUNOV, N.P.

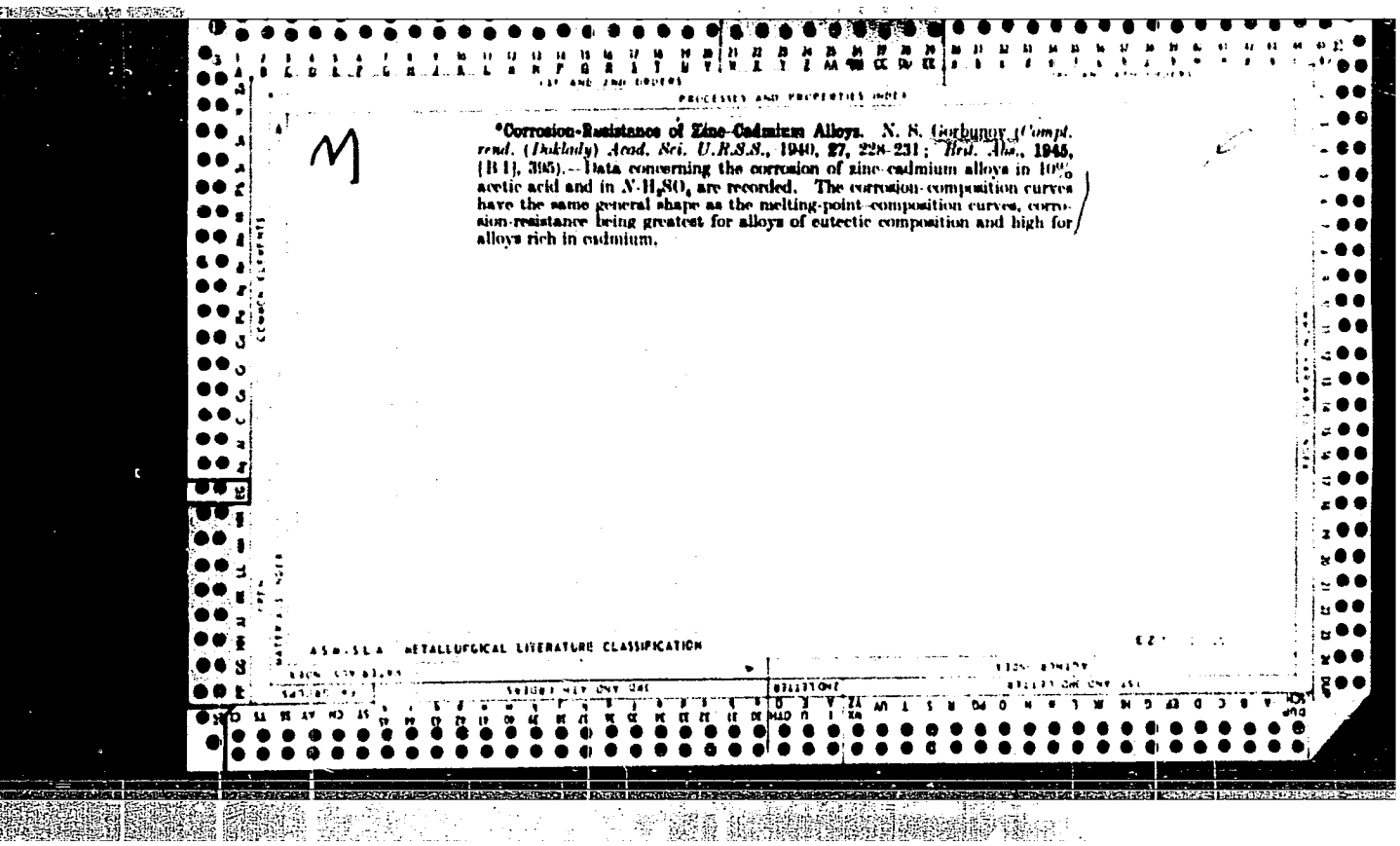
Petroleum refineries are improving the quality of automobile gasoline. Neftianik 7 no.6:19-20 Je '62. (MIRA 15:8)

1. Glavnyy spetsialist Gosudarstvennogo komiteta Soveta Ministrov RSFSR po koordinatsii naucho-issledovatel'skikh rabot.
(Gasoline)

GORBUNOV, N.P.

Improving the quality of petroleum products. Biul.tekh.-ekon. inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. no.9:74 '63. (MIRA 16:10)





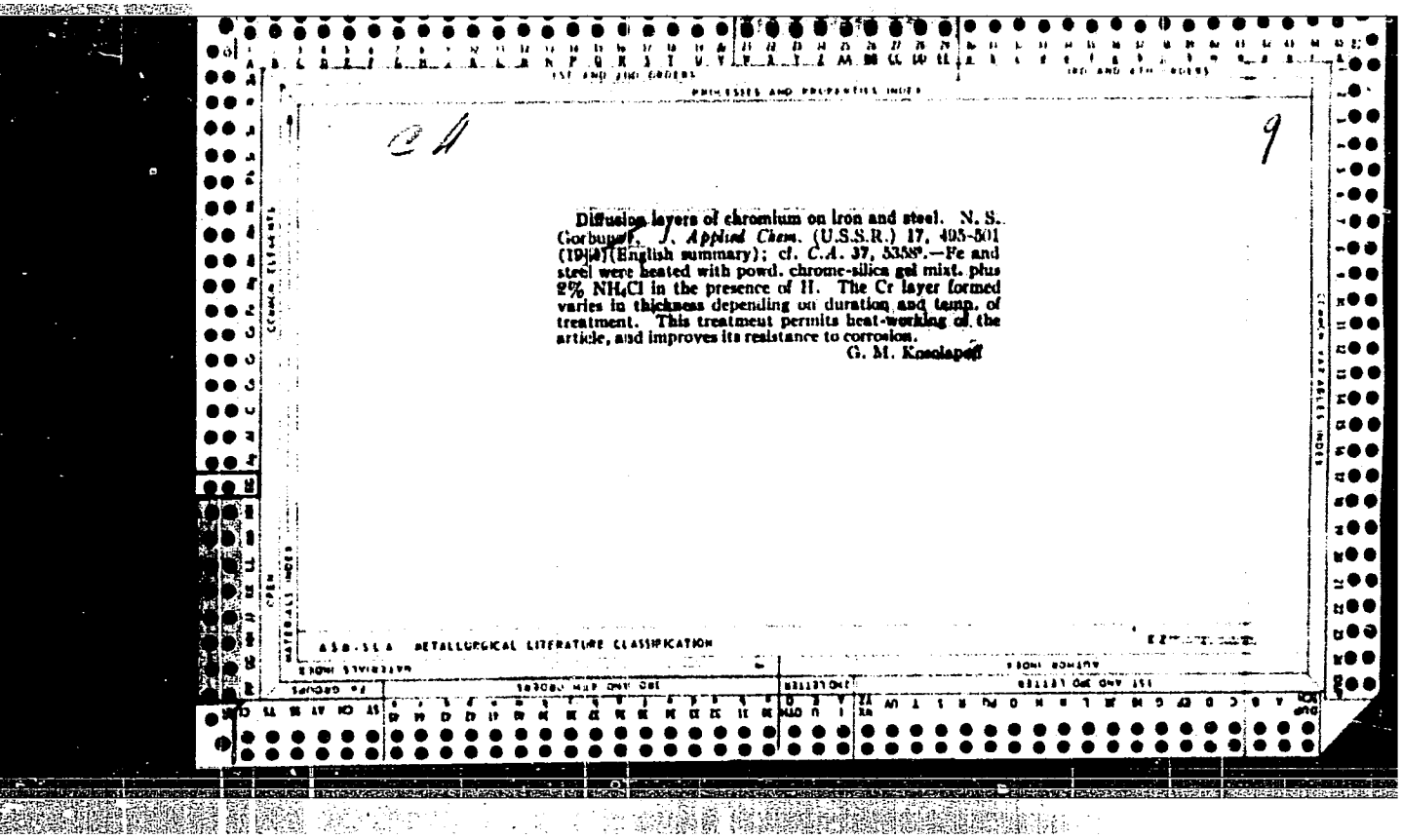
***Corrosion-Resistance of Zinc-Cadmium Alloys.** *N. S. Gorbunov (Compt. rend. (Doklady) Acad. Sci. U.R.S.S., 1940, 27, 228-231; Brit. Abs., 1945, [B II], 305).*—Data concerning the corrosion of zinc-cadmium alloys in 10% acetic acid and in N-H_2SO_4 are recorded. The corrosion-composition curves have the same general shape as the melting-point–composition curves, corrosion-resistance being greatest for alloys of eutectic composition and high for alloys rich in cadmium.

MA

5

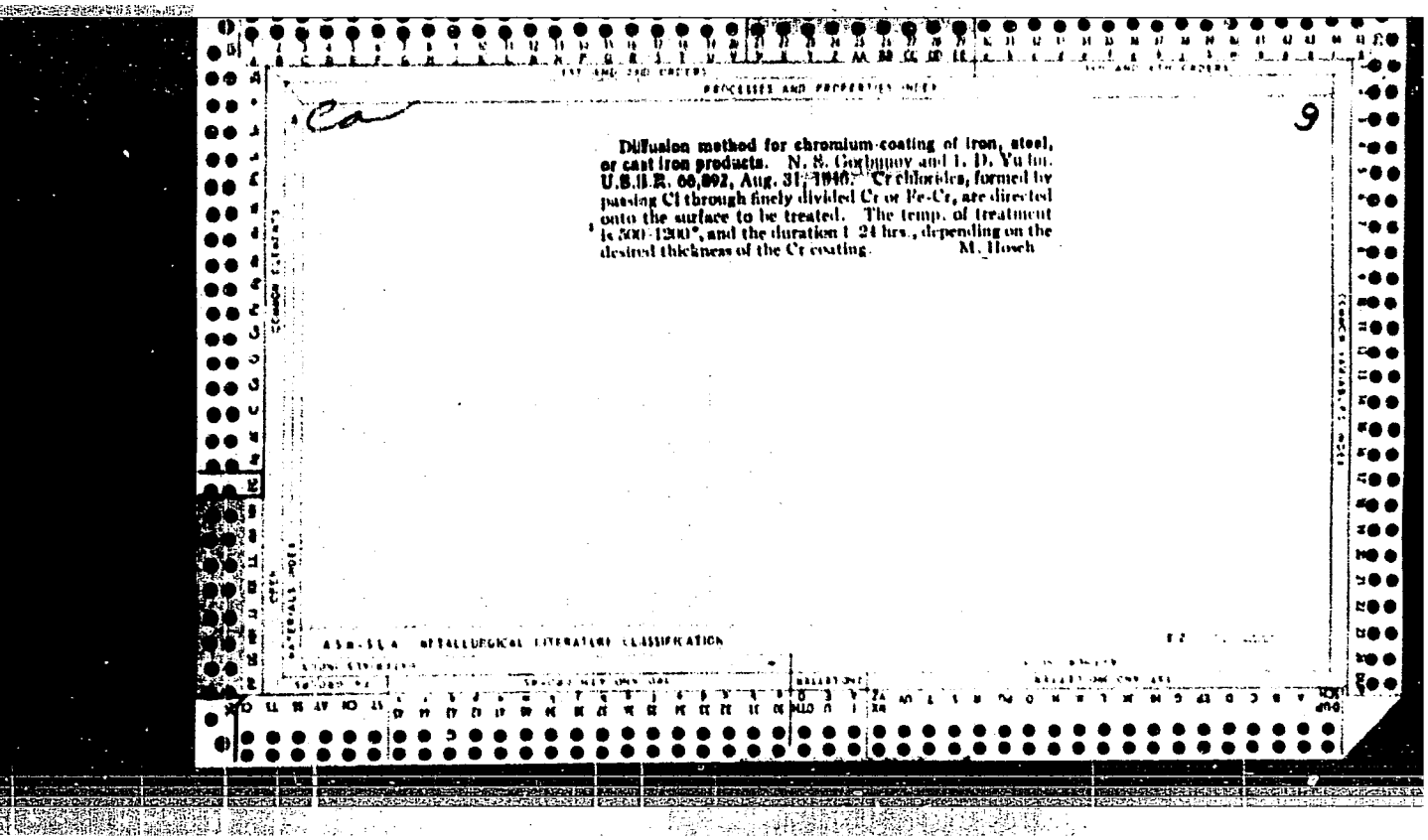
*Chrome Plating of Steel and Iron Ware in the Gaseous Phase. N. S. [illegible]nov and F. S. Baryshanskaya (*Compt. rend. (Doklady) Acad. Sci. U.R.S.S.*, 1942, 37, (9), 277-280).—[In English.] The treatment of iron or steel samples with chromium chloride vapour at about 900° C. leads to formation of compact layers of chromium without porosity and without the sharp demarcation boundaries obtained in electroplating. In the process the dimensions of the treated article increase. The increase depends on the duration and temperature of treatment, and should be allowed for in practice. Coating with chromium is possible for steels containing up to 1% of carbon, and gives surfaces which are resistant to corrosion and abrasion. Spectrographic analysis of layers at various depths from the surface after coating for 4 hrs. at 900° C. shows that the chromium content of the outermost layers is of the order of 50%, falling to <5% at a depth of 40 μ.—G. V. R.

1943



Diffusion layers of chromium on iron and steel. N. S. Gorbunoff. *J. Applied Chem.* (U.S.S.R.) 17, 495-501 (1944)(English summary); cf. *C.A.* 37, 5358⁹.—Fe and steel were heated with powd. chrome-silica gel mixt. plus 2% NH_4Cl in the presence of H. The Cr layer formed varies in thickness depending on duration and temp. of treatment. This treatment permits heat-working of the article, and improves its resistance to corrosion.

G. M. Kosolapoff



9

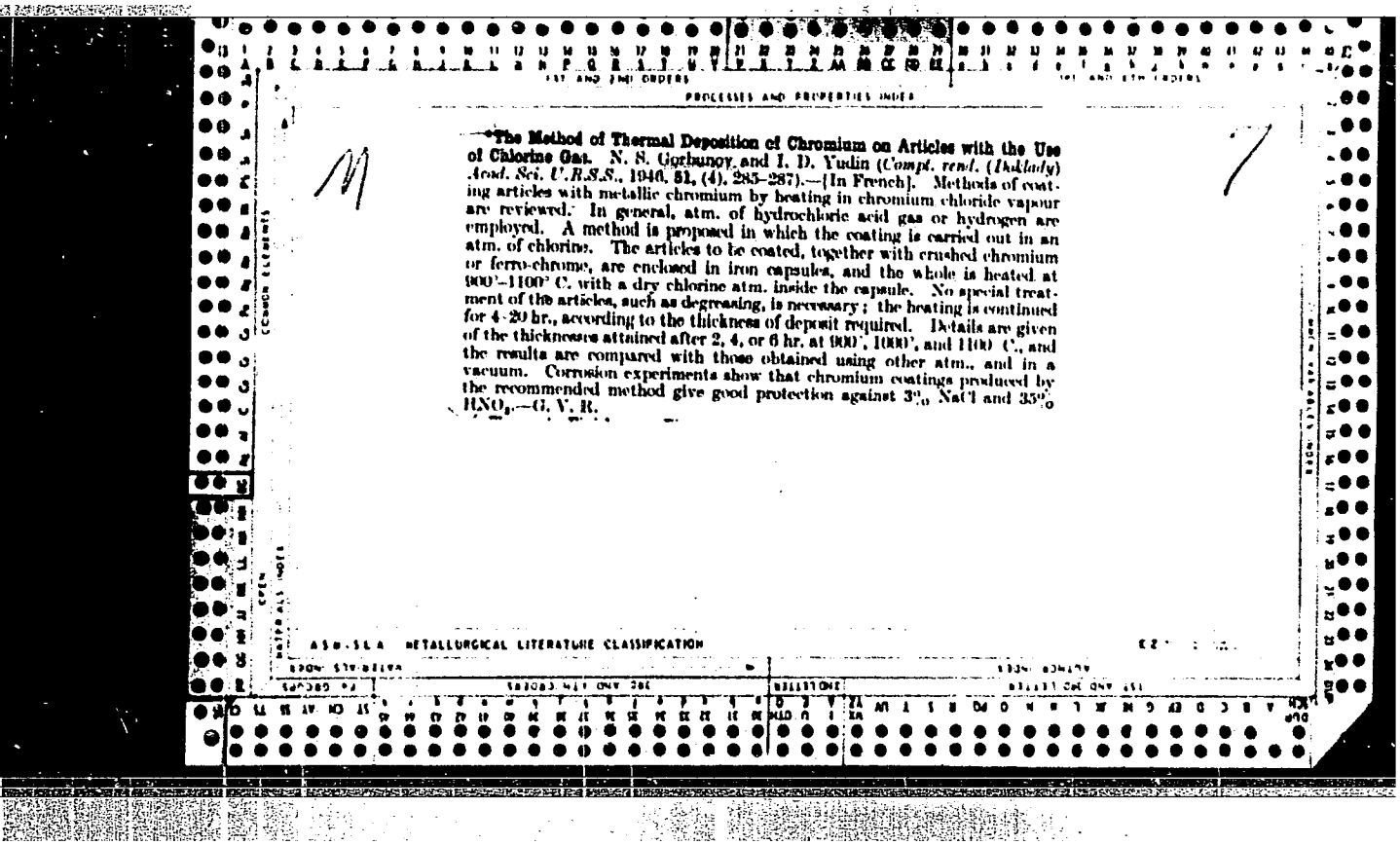
Diffusion method for chromium-coating of iron, steel, or cast iron products. N. S. Gorbunov and I. D. Yu'in. U.S.S.R. 66,092, Aug. 31, 1946. Cr chlorides, formed by passing Cl through finely divided Cr or Fe-Cr, are directed onto the surface to be treated. The temp. of treatment is 500–1200°, and the duration 1–24 hrs., depending on the desired thickness of the Cr coating. M. Hoseh

PROCESSES AND PROPERTIES INDEX

M

Gorbunov, N. S., and I. D. Yudin. *Diffusible Chromium Coatings.* Pp. 51. Illustrated. 1948. Moscow.

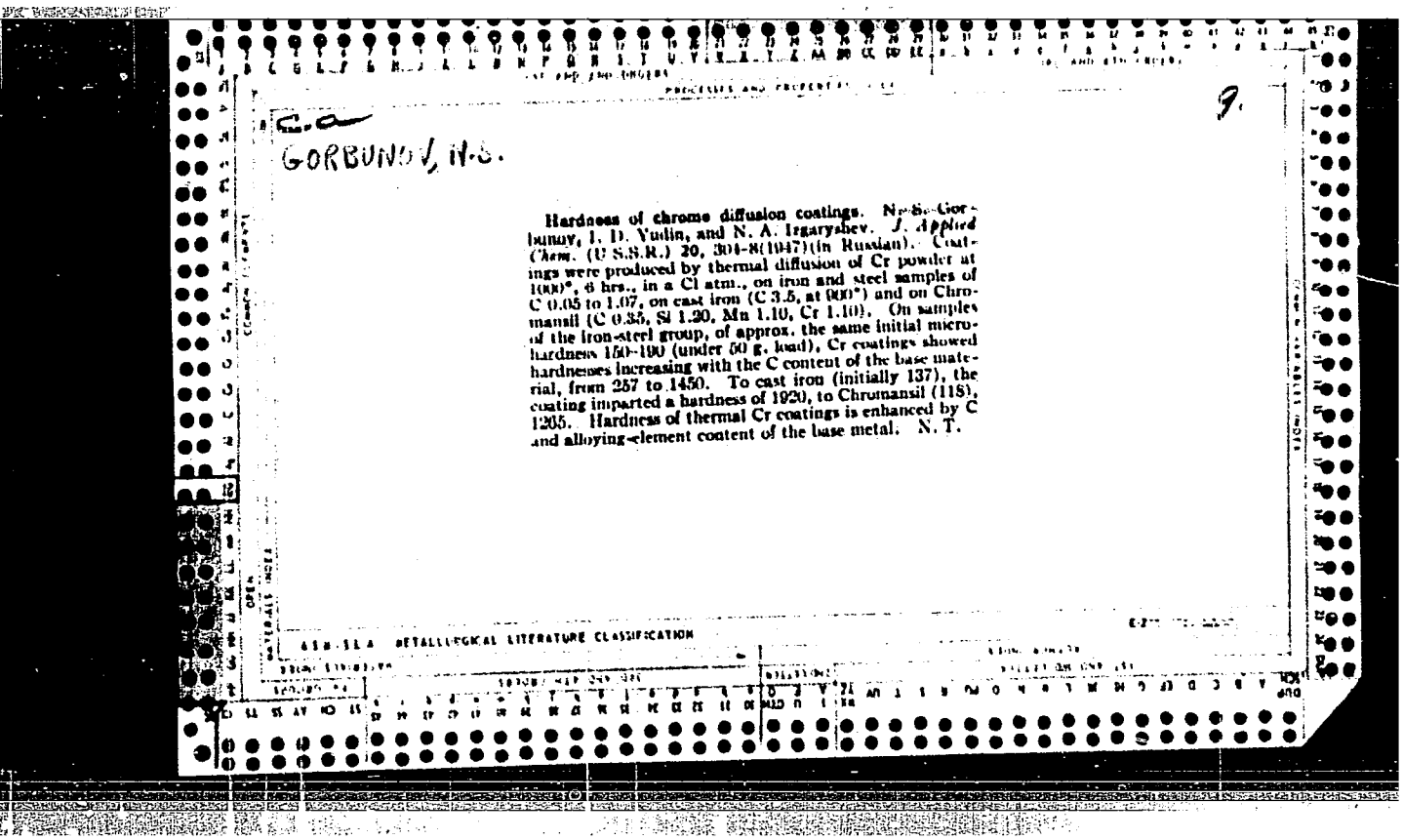
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

The Method of Thermal Deposition of Chromium on Articles with the Use of Chlorine Gas. N. S. Gorbunov and I. D. Yudin (*Compt. rend. (Doklady) Acad. Sci. U.R.S.S.*, 1946, 51, (4), 283–287).—[In French]. Methods of coating articles with metallic chromium by heating in chromium chloride vapour are reviewed. In general, atm. of hydrochloric acid gas or hydrogen are employed. A method is proposed in which the coating is carried out in an atm. of chlorine. The articles to be coated, together with crushed chromium or ferro-chrome, are enclosed in iron capsules, and the whole is heated at 900°–1100° C. with a dry chlorine atm. inside the capsule. No special treatment of the articles, such as degreasing, is necessary; the heating is continued for 4–20 hr., according to the thickness of deposit required. Details are given of the thicknesses attained after 2, 4, or 6 hr. at 900°, 1000°, and 1100° C., and the results are compared with those obtained using other atm., and in a vacuum. Corrosion experiments show that chromium coatings produced by the recommended method give good protection against 3% NaCl and 35% HNO_3.—G. V. R.

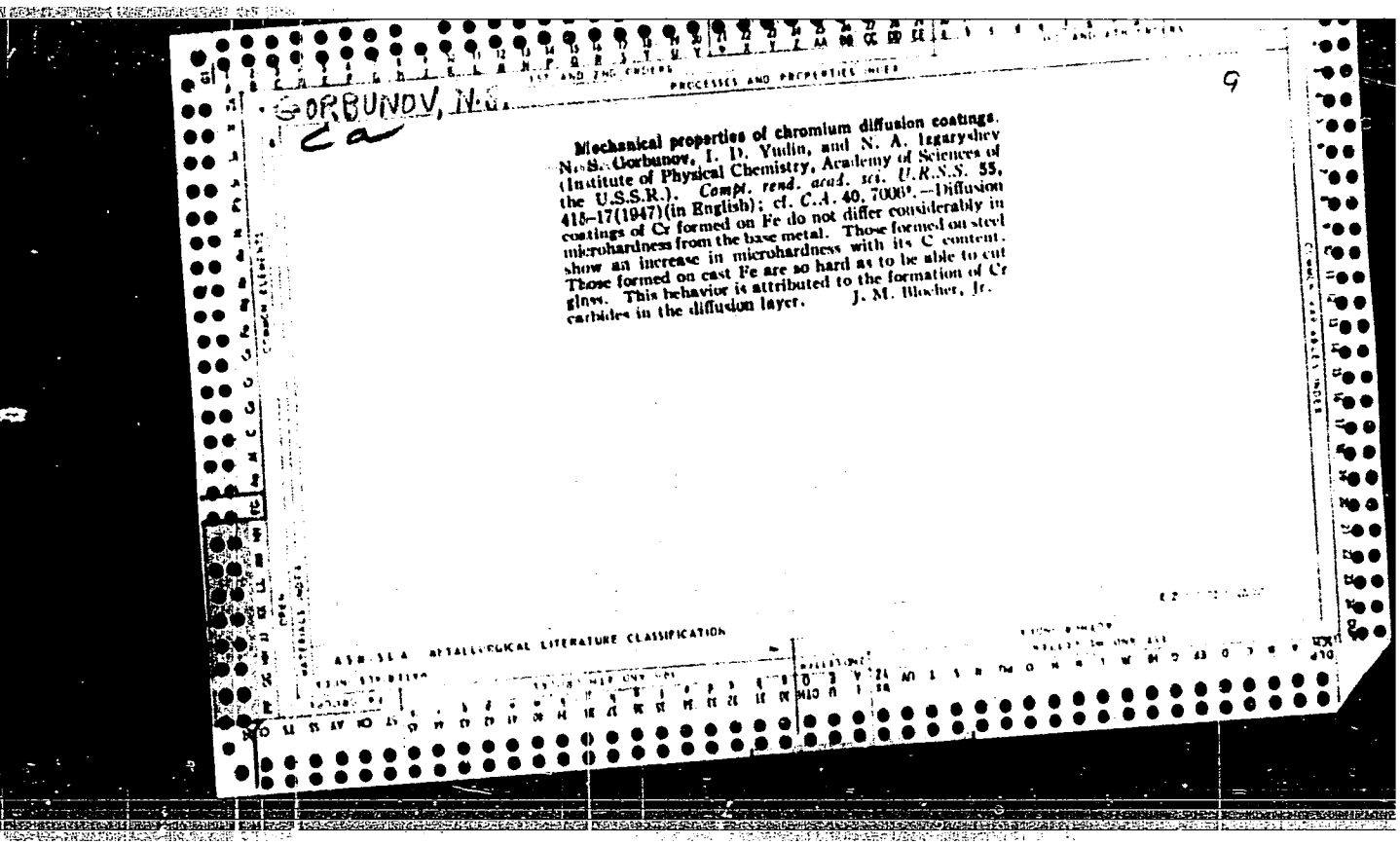
A 5 8 - 5 6 A METALLURGICAL LITERATURE CLASSIFICATION



9.

GORBUNOV, N.S.

Hardness of chrome diffusion coatings. N. S. Gorbunov, I. D. Yudin, and N. A. Izgaryshev. *J. Applied Chem.* (U.S.S.R.) 20, 304-8(1947)(in Russian). Coatings were produced by thermal diffusion of Cr powder at 1000°, 6 hrs., in a Cl atm., on iron and steel samples of C 0.05 to 1.07, on cast iron (C 3.5, at 900°) and on Chromansil (C 0.35, Si 1.20, Mn 1.10, Cr 1.10). On samples of the iron-steel group, of approx. the same initial microhardness 150–190 (under 50 g. load), Cr coatings showed hardnesses increasing with the C content of the base material, from 257 to 1450. To cast iron (initially 137), the coating imparted a hardness of 1920, to Chromansil (118), 1205. Hardness of thermal Cr coatings is enhanced by C and alloying-element content of the base metal. N. T.



GORBUNOV, N.S.

Ca

9

Mechanical properties of chromium diffusion coatings. N. S. Gorbunov, I. D. Yudin, and N. A. Izgaryshev (Institute of Physical Chemistry, Academy of Sciences of the U.S.S.R.). *Compt. rend. acad. sci. U.R.S.S.* 55, 413–17(1947)(in English); cf. *C.A.* 40, 7000⁹.—Diffusion coatings of Cr formed on Fe do not differ considerably in microhardness from the base metal. Those formed on steel show an increase in microhardness with its C content. Those formed on cast Fe are so hard as to be able to cut glass. This behavior is attributed to the formation of Cr carbides in the diffusion layer. J. M. Blocher, Jr.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GORBUNOV, N.S.

"The micro-hardness of diffused chrome platings"
pp. 197 of the monograph "Microhardness", Acad. Sci. U.S.S.R.
1951

GORBUNOV, N.S.

*Wear-Resistance of Diffusion Chromium Coatings. N. S. Gorbunov and V. I. Lazarev (Doklady Akad. Nauk S.S.S.R., [illegible], 345-347) (In Russian) Diffusion coatings ... were prepared on Armco Fe by the method developed in the Institute of Physical Chemistry (Izvestiya ... Otdel. Khim. ... 1949 ...) ... Diffusion ... 1948 ... [illegible] ... 1949 ... [illegible]

... wrapped around the perimeter of a disc, against a cylindrical specimen, rotating at 20 r.p.m. This gave point contact under a load of 2400 g. and conditions of dry friction; the depth of the resulting groove was determined with a ... Express[ed] in ... the wear ... [illegible]

GORBUNOV, N.S.

Microhardness of diffused silicon coatings. N. S. Gorbunov, A. S. Akopdzhanyan, and N. A. Izgaryshev. Doklady Akad. Nauk S.S.S.R. 91, 285 (1953). Steels contg. [illegible] % were S[illegible] [illegible] [illegible] The [illegible] that [illegible] dependent on the C content. In the base metal the [illegible] hardness (kg./sq. mm.) ranges from 20[illegible] at [illegible] % C to 28[illegible] (at 1.12% C). The corresponding variation in the surface layer through which the Si has diffused is 128-785.

H. Fuchsman

Name: GORBUNOV, Nikolay Stepanovich

Dissertation: Experimental Study of the Processes of Formation and Properties of Diffusion Coatings on Iron and its Alloys

Degree: Doc Chem Sci

Affiliation: [not indicated]

Defense Date, Place: 15 Dec 55, Council of Inst of Physical Chemistry, Acad Sci USSR

Certification Date: 15 Sep 56

Source: BMVO 6/57

GORBUNOV, N.S.

PHASE X TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 758 - X

BOOK Call No.: AF674366

Author: GORBUNOV, N. S.
Full Title: VACUUM METHOD OF THERMAL CHROME PLATING
Transliterated Title: Vakuumnyy metod termokhromirovaniya

PUBLISHING DATA

Originating Agency: Institute of Physical Chemistry, Academy of Sciences, USSR
Publishing House: Publishing House of the Academy of Sciences, USSR
Date: 1955 No. pp.: 45 No. of copies: 3,000
Editorial Staff: V. I. Likhtman, Dr. of Phys. and Math. Sci., Chief Editor

PURPOSE AND EVALUATION: The purpose is not specified. The booklet contains thorough information on the subject, but Soviet methods or instruments are briefly mentioned two or three times only.

TEXT DATA

Coverage: See "Annotated Table of Contents"

Table of Contents (Annotated) Pages

and improves the mechanical properties of machine parts. Vacuum method of thermal chrome plating, the most efficient method for surface protection.

Ch. 1. Methods of Thermal Chrome Plating 7-14
Brief descriptions of various methods. Detailed analysis of the new chlorine method worked out by the Institute of Physical Chemistry, Acad. of Sci., USSR, checked under industrial conditions, and used in Soviet industry. According to the author, the chlorine method is free from defects characterizing other methods of thermal chrome plating in gas media. Illustrated by 3 tables and a diagram.

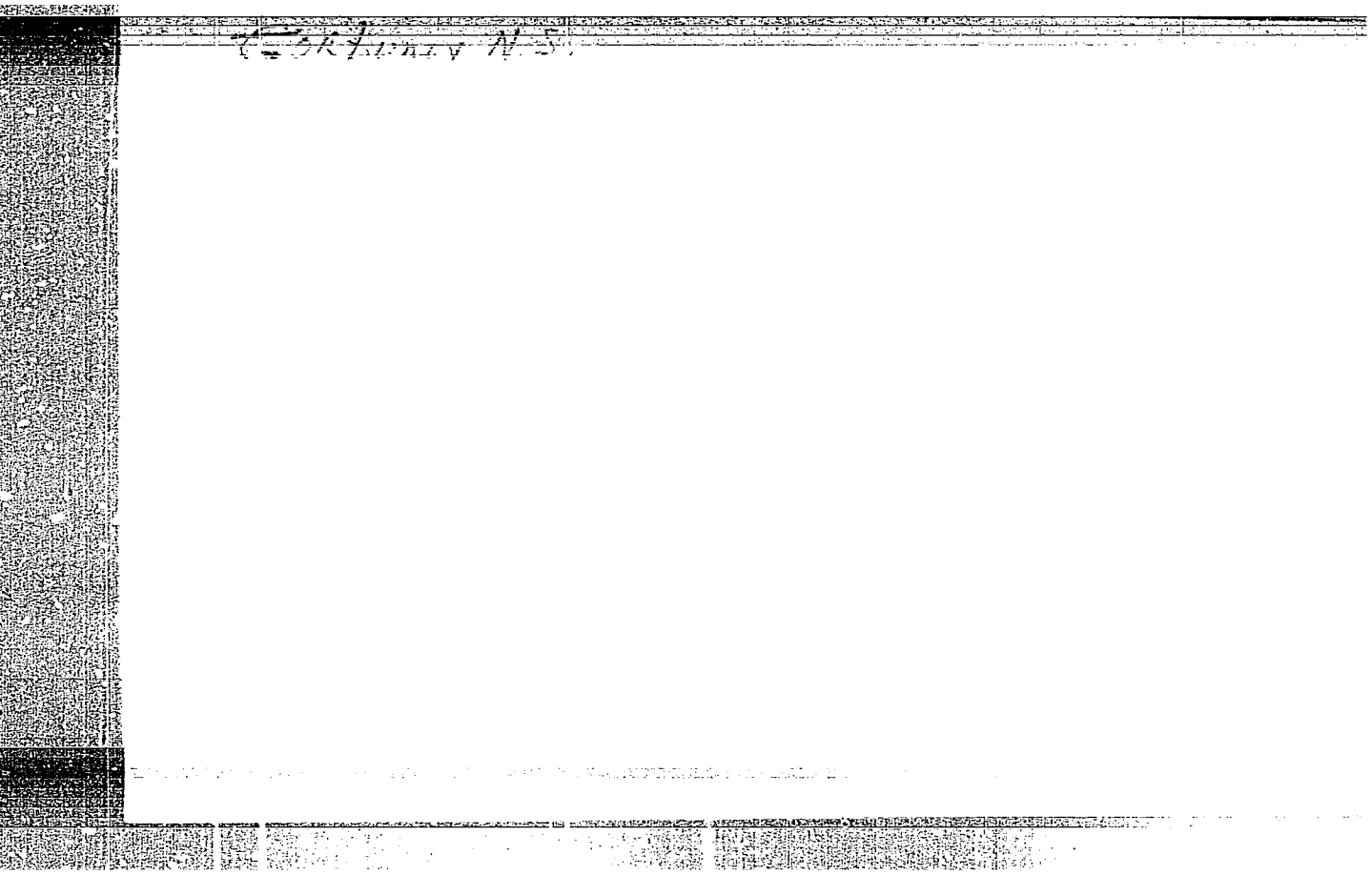
Ch. 2. Elements of Vacuum Techniques 14-21
Vacuum pumps. Descriptions and diagrams of rotary oil pumps and oil-diffusion or mercury-condensation pumps. Mercury pressure gauges. McLeod gauge, and gauge with thermocouple for determining the residual pressure of gases, illustrated by diagrams.

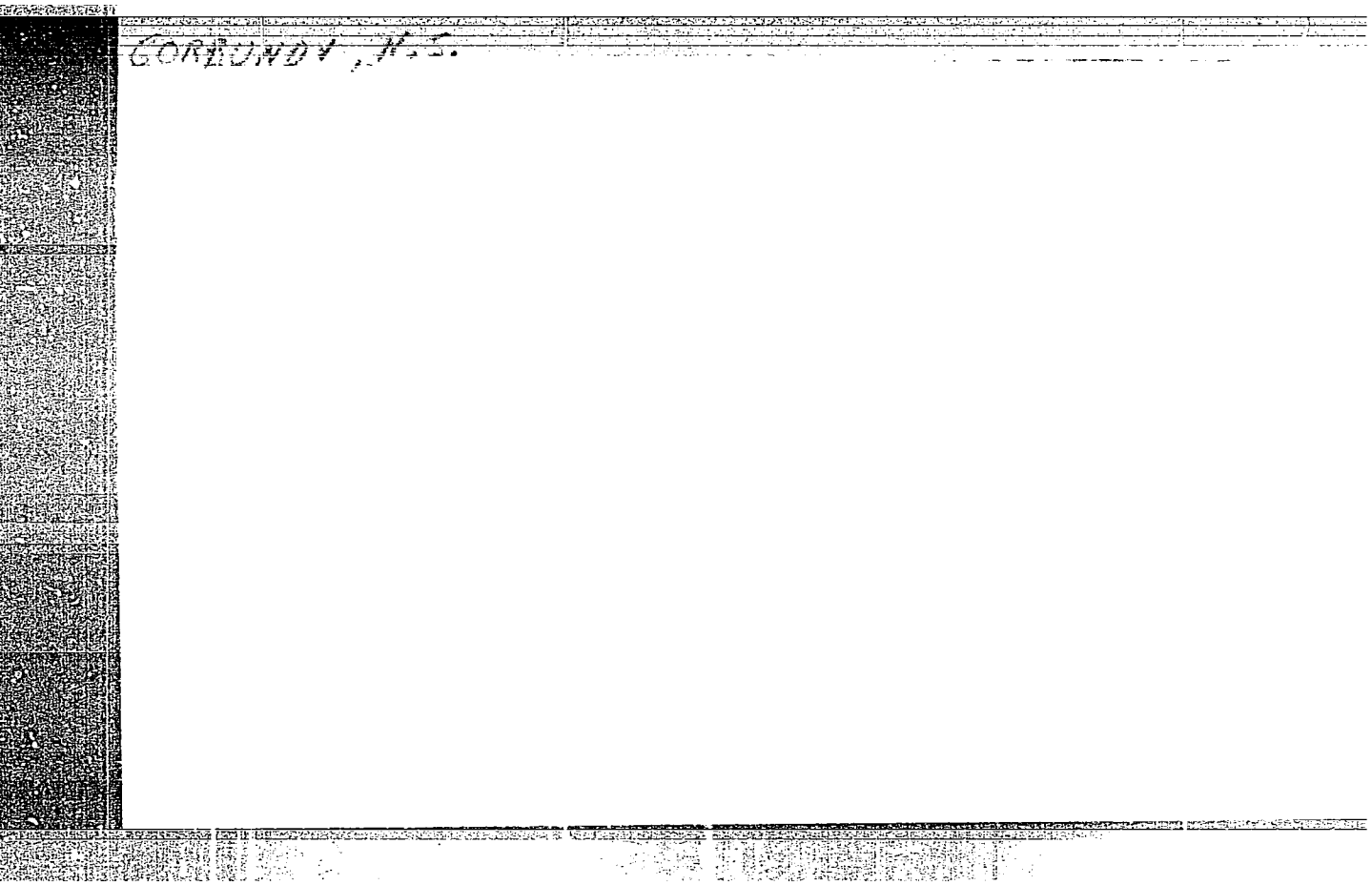
Ch. 3. Vacuum Method of Thermal Chrome Plating 22-31
Equipment for diffusion metallization is made of heat-resisting materials. Descriptions with diagrams of installations for thermal chrome

Vakuumnyy method termokhromirovaniya AID 758 - X

No. of References: Total 29; 23 Russian, 1913-1952.
Facilities: None

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000516110016-0"





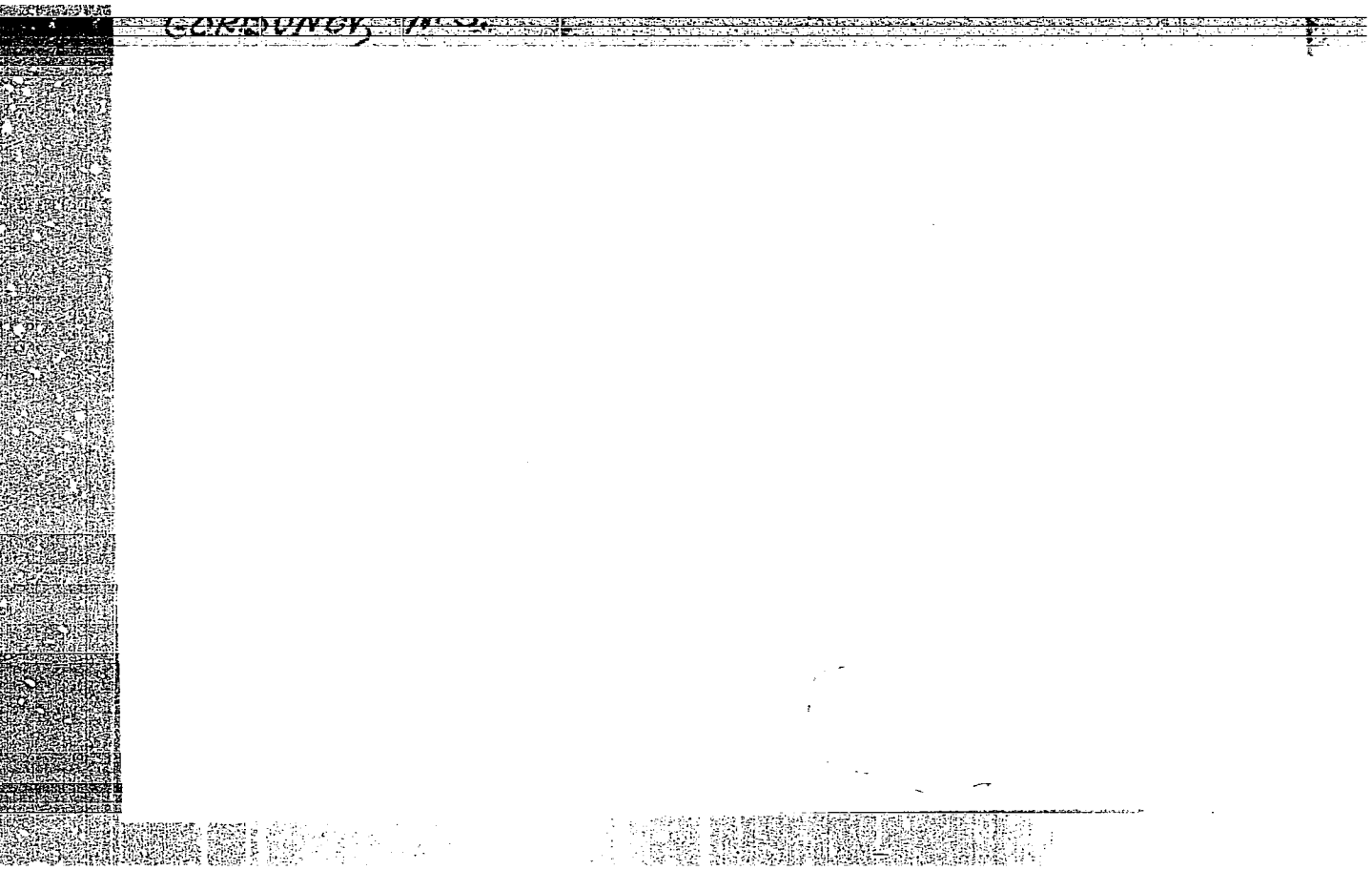
GORBUNOV, N. S.

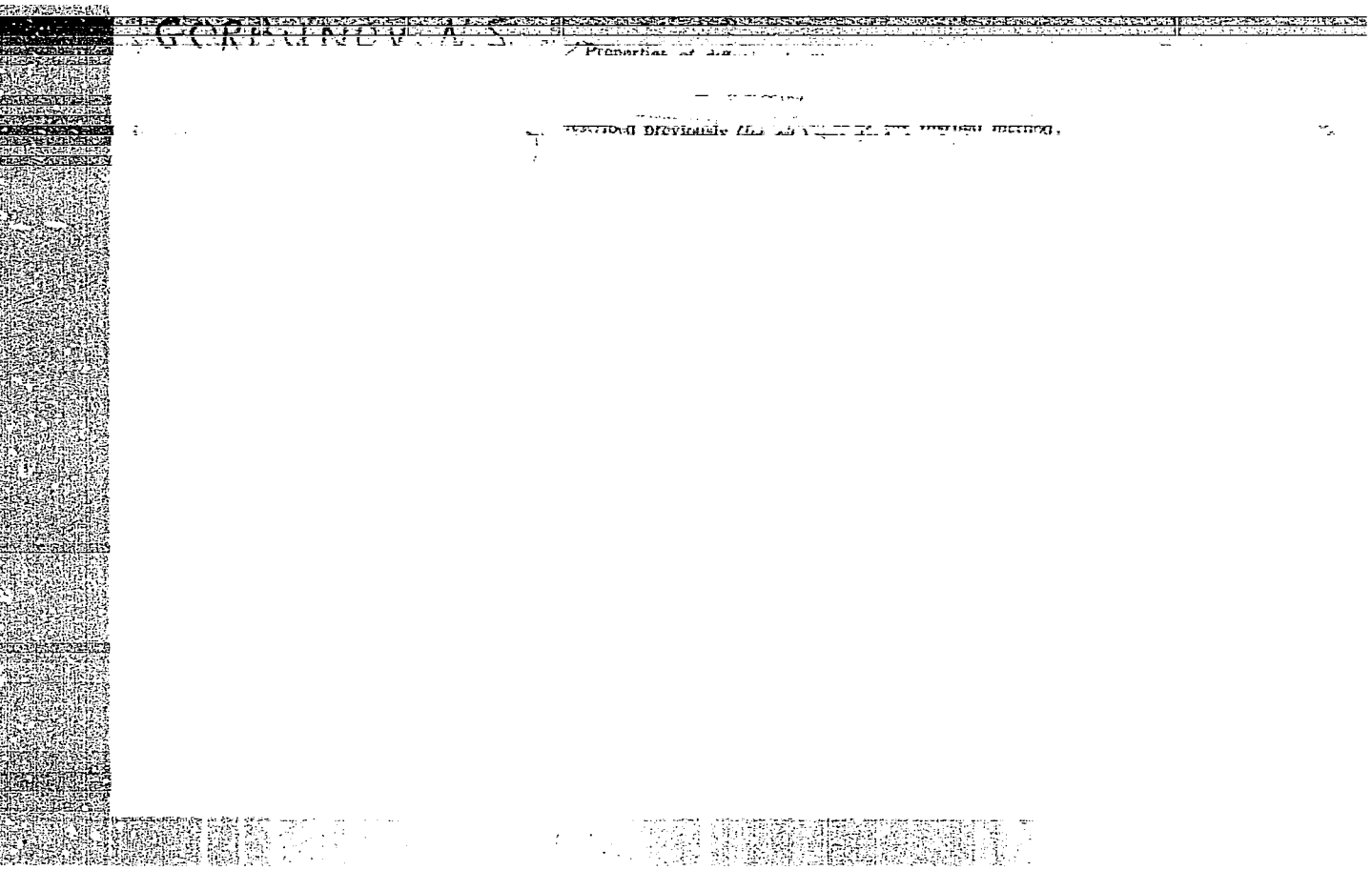
Gorbunov, N. S., "The Increase of Heat Resistance of Carbon Steel by Diffusion Plating."

in book Research on Heat Resistant Alloys, pub by Acad. Sci. USSR, Moscow, 1956, 160 pp.

Inst. Metallurgy im A. A. Baykov

GORBUNOV, N. S.





GORBUNOV, N.S.

LEVIN, A.I.

25(0) PHASE I BOOK EXPLOITATION SOV/1389

Akademiya nauk SSSR. Institut fizicheskoy khimii

Teoriya i praktika elektroliticheskogo khromirovaniya (Theory and Practice of Electrolytic Chromium Plating) Moscow, Izd-vo AN SSSR, 1957.
231 p. 5,000 copies printed.

Resp. Eds.: Vagramyan, A.T., Professor, N.T. Kudryavtsev, Professor, and M.A. Shlugar, Candidate of Technical Sciences; Ed. of Publishing House: Yegorov, N.G.; Tech. Ed.: Pavlovskiy, A.A.

PURPOSE: This book is for engineers, industrial workers, members of scientific research institutions and teachers concerned with modern methods of electroplating and the manufacture of corrosion-resistant metallic instruments.

COVERAGE: The collection contains sixteen reports and the texts of several discussions presented before the March 1955 Conference on the Theory and Practice of Chromium Plating, sponsored jointly by the Institute of Physical Chemistry, AS USSR, and the Moscow Scientific, Engineering and Technical Society for Instrument Making. The reports reflect the conference's aim of a wide exchange of opinion on problems of chromium electrodeposition and offer solutions

Card 1/4

Gorbunov, N. S. Microhardness and Wear-resistance of Diffusion Chromium Coatings 108

137-58-6-13769

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 366 (USSR)

AUTHOR: Gorbunov, N.S.

TITLE: Microhardness and Wear Resistance of Diffusive Chromium Coatings (Mikrotverdost' i iznosostoykost' diffuzionnykh khromovykh pokrytiy)

PERIODICAL: V sb.: Teoriya i praktika elektrolit. khromirovaniya. Moscow, AN SSSR, 1957, pp 108-116

ABSTRACT: A study of microhardness and wear resistance of diffusive chrome coatings (C) applied on the surface of iron, steel (U-10; St-45; St-10), and cast iron specimens. The microhardness of of C was determined on the PMT-3 apparatus with a 50-g load, and wear resistance on a Skoda-Savin apparatus in a 5% aqueous solution of $K_2Cr_2O_7$ and a 15-kg pressure on the disc, also on an apparatus constructed by B.V. Deryagin and V.P. Lazarev with a point contact of rubbing surfaces with a 2400-g load at the point of contact. The amount of wear in the last case was determined by measuring the depth of the groove under a Linnik microscope. It was determined that chromium plating increases the hardness and wear resistance of Fe. The hardness

Card 1/2

137-58-6-13769

Microhardness and Wear Resistance of Diffusive Chromium Coatings

of C on steel increases with an increase of carbon contents in the parent metal. The hardest C is obtained on cast iron. It was determined that C can be accomplished on the condition that the atomic diameter of the coating element is either smaller than the atomic diameter of Fe or surpasses it by no more than 15-16% with a sufficient solubility of the coating material in Fe at room and elevated temperatures. These conditions are met by N, C, Ta, Cu, Nb, Au, Ti, Mo, As, Zn, W, Al, V, Mn, Cr, Si, and B. Saturation with Si, B, and other elements also improves the mechanical properties of Fe and steel.

T.M.

1. Chromium plating--Mechanical properties 2. Chromium plating--Test results
3. Chromium coatings--Hardness 4. Iron--Coatings

Card 2/2

137-58-6-12801

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 230 (USSR)

AUTHOR: Gorbunov, N.S.

TITLE: Physicochemical Conditions for the Formation of Diffusion Coatings and Methods for Their Application (Fiziko-khimicheskiye usloviya obrazovaniya diffuzionnykh pokrytiy i metody ikh naneseniya)

PERIODICAL: V sb.: Issled. po zharoprochn. splavam. Vol 2, Moscow, AN SSSR, 1957, pp 186-197

ABSTRACT: The conditions necessary for the formation of diffusion coatings (DC) on Fe are the following: 1) A small difference in atomic diameters of Fe and the coating element (E) $\leq$ 15-16%; 2) a definite solubility of the coating E in Fe. The solubility of the coating E's in α Fe at 20°C and the atomic diameters of various E's are graphically compared. According to the first condition the highest value of the diameter of E is 2.94 angstrom. A material having a greater atomic diameter does not produce DC (except for Zr). A description of the methods of application of DC using molten and powdered material with the aid of Cl_2 or HCl and in vacuum is given. The most effective

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Physicochemical Conditions for (cont.)

is the hydrogen-vacuum method: heating in H_2, holding under a vacuum, and cooling in H_2. The curves of the thickness of the layer in mm versus the time in hours required for the diffusion in Fe are given for the E's pertaining to groups I-VII of the periodic system. Bibliography: 15 references.

A.S.

1. Coatings--Physical properties 2. Coatings--Chemical properties
3. Iron--Coatings 4. Coatings--Applications

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SOV/137-58-8-17339

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 163 (USSR)

AUTHOR: Gorbunov, N.S.

TITLE: Methods of Application of Diffusion Coatings (Metody nanesen-iya diffuzionnykh pokrytiy)

PERIODICAL: Tr. In-ta fiz. khimii. AN SSSR, 1957, Nr 6, pp 99-110

ABSTRACT: The fundamental conditions determining the possibility of formation of stable diffusion coatings on the surface of Fe and its alloys, namely, the magnitude of the ratio of the dimensions of the atomic diameters of Fe and of the applied protective material, its solubility in Fe at room and elevated temperatures, the presence of a direct contact between the surfaces of the applied material and the metal being coated, elimination of the penetration of moisture and O_2 into the reaction space, and others, are examined. Plans of the installations for the production of diffusion coatings in molten salt media, in H_2, NH_3, and Cl_2 atmospheres and under vacuum while being heated externally by resistance furnaces and by an induction high-frequency generator, are adduced and examined. It is remarked that the most effective methods of application of diffusion

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Methods of Application of Diffusion Coatings

coatings are the vacuum and the hydrogen-vacuum ones. Bibliography: 25 references.

P.S.

1. Iron--Coatings 2. Iron alloys--Coatings
3. Coatings--Materials 4. Coatings--Performance

1

GORBUNOV, N.S.; LATUKHOVA, A.G.

Diffusion copper plating. Zhur.prikl.khim. 30 no.1:81-83 Ja '57.
(MLRA 10:5)

1.Institut fizicheskoy khimii Akademii nauk SSSR.
(Copper plating)

GORBUNOV, N. S.,

"Titanium Diffusion Coatings on Iron," Titan i yego splavy; metallurgiya i metallovedeniye (Titanium and Its Alloys; Metallurgy and Physical Metallurgy), Moscow, Izd-vo AN SSSR, 1958. p 87.

Institute of Physical Chemistry, USSR Acad. Sci.

15(7) PHASE I BOOK EXPLOITATION SOV/1222

Gorbunov, Nikolay Stepanovich

Diffuzionnyye pokrytiya na zheleze i stali (Diffusion Coatings on Iron and Steel) Moscow, Izd-vo AN SSSR, 1958. 207 p. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fizicheskoy khimii. Ed.: Likhtman, V.I., Doctor of Physical and Mathematical Sciences; Ed. of Publishing House: Yegorov, N.G.; Tech. Ed.: Polenova, T.P.

PURPOSE: This book is for engineers, technicians, and metallurgists working in the field of diffusion coatings.

COVERAGE: The author discusses various methods of forming diffusion coatings (in a vacuum, in molten media); X-ray and electron-diffraction analysis of the coatings; diffusion coatings formed by copper, gold, zinc, beryllium, boron, aluminum, silicon, titanium, vanadium, chromium, molybdenum, tungsten, manganese, and other elements. A considerable portion of the book is concerned with experimental investigations, stated to be of practical importance. The author states that investigations of diffusion coatings in the USSR were begun in 1936 by N.A. Izgaryshev and E.S. Sarkisov at the Kolloidoelektrokhimicheskiy institut

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(Institute of Colloids and Electrochemistry) of the USSR Academy of Sciences, and that at present this work is being continued at the Academy in its Institute of Physical Chemistry under the general direction of Academician, P.A. Rebinder. The book is based in part on the work of the following personalities: M.I. Vitovtova, O.G. Sel'skaya, A.G. Latukhova, A.S. Akopdzhanyan, I.I. Aryamova, V.F. Dzneladze, V.K. Gryaznov, L.V. Yeremeyeva, Ye.F. Sorokina, Z.M. Zanozina, and others. Chapter IV was written in part by N.A. Shishakov, Doctor of Chemical Sciences. There are 192 references, of which 111 are Soviet, 37 English, 34 German, and 10 French.

TABLE OF CONTENTS:

Diffusion Coatings on Iron (Cont.)

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GORBUNOV, N.S.

Titanium diffusion coatings on iren. Titan i ego splavy no. 1:87-90 '58. (MIRA 14:5)

1. Institut fizicheskoy khimii AN SSSR.
(Diffusion coatings) (Titanium)

GORBUNOV, N.S.

PHASE I BOOK EXPLOITATION SOV/3559

Akademiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1959. 425 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V.A. Klimov; Tech. Ed.: I.F. Kuz'min; Editorial Board: I.P. Bardin, Academician, G.V. Kurdyumov, Academician, N.V. Ageyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Oding, I.M. Pavlov, and I.F. Zudin, Candidate of Technical Sciences.

PURPOSE: This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

COVERAGE: This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Each of the papers is devoted to the study of the factors which affect the properties and behavior of metals. The effects of various elements such as Cr, Mo, and W on the heat-resisting properties of various alloys are studied. Deformability and workability of certain metals as related to the thermal conditions are the object of another study described. The problems of hydrogen embrittlement, diffusion and the deposition of ceramic coatings on metal surfaces by means of electrophoresis are examined. One paper describes the apparatus and methods used for growing monocrystals of metals. Boron-base metals are critically examined and evaluated. Results are given of studies of interatomic bonds and the behavior of atoms in metal. Tests of turbine and compressor blades are described. No personalities are mentioned. References accompany most of the articles.

AVAILABLE: Library of Congress

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GORBUNOV, N S

Diffuse coatings on iron and steel. (Jerusalem?) Published for the National Science Foundation, Washington, D.C. and the Department of Commerce., by the Israel Program for Scientific Translations, 1960.

165 p. Illus., Diagrs., Graphs, Tables

At head of title: Akademiya Nauk SSSR. Institut Fizicheskoy Khimii.

Translated from the original Russian: Diffuzionnyye Pokrytiya Na Zheleze I Stali, Moscow, 1958.

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AUTHORS: Gorbunov, N. S. and Izvekov, V. I.

TITLE: Study of Diffusion in Metal Oxides by Means of Radioactive Isotopes

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 2, pp. 273 - 306

TEXT: The present paper gives a survey of the methods and results of diffusion studies in oxide-coated metal surfaces. The representation of the instruments, the experimental methods, and part of the results are taken from Soviet publications. Gorbunov himself made his studies at the Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry of the AS USSR) which have been reported already in Ref. 5. First a survey is given of the experimental methods and a number of details concerning the apparatus used are discussed. Fig. 1 shows the scheme of an oxidation and diffusion apparatus; Fig. 2 shows an apparatus used for diffusion experiments, Fig. 3 an apparatus for the

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production of radioactive red PbO in studying the powder reactions in silicate systems, Fig. 4 shows the schematic representation of a heater cell, and Fig. 5 a vacuum furnace, Fig. 7 shows an apparatus for studying diffusion and exchange, Fig. 8 an apparatus for applying this layers, Fig. 9 - 12 show apparatus used for studying diffusion processes between FeO and Al_2O_3. The authors used apparatus which are described in Refs. 32 and 33. The most simple variant of a cell for diffusion heating is shown in Fig. 13. A combined apparatus which was designed by the authors and which consists of four main components: a device for applying the radioactive coating by means of vacuum evaporation (1), an electrical furnace with platinum resistance thermometer (2), a temperature control device (3), and a quartz tube for distributing the samples (4), is shown in Fig. 14. The individual components are partly discussed in detail, partly they are only mentioned. Chapter 2 gives a discussion of the methods of determining the diffusion coefficient D in metals and their oxides. The following methods are briefly discussed: without use of a radioactive indicator:

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Study of Diffusion in Metal Oxides by Means of Radioactive Isotopes

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with an ordinary indicator, e.g. CuJ for AgJ; determination of D from ionic conductivity; from the isotope exchange rate, and on the basis of the phase transformations in the diffusion zone. With tagged atoms: the Stefan-Kowalski method; the method of the propagation of a thin radioactive layer, the contact method; the method of absorption of alpha radiation; the determination of D on the basis of absorption of recoil nuclear radiation; the method of unilateral activation of a tablet; the method of activating a thin layer. The ranges of applicability of the individual methods are illustrated in a diagram (Fig. 17). Furthermore the authors report on the results of diffusion studies in different elements in metal oxides. They give abundant experimental material, mainly taken from non-Soviet publications. First the diffusion in simple oxide compounds is dealt with; part of the data which are fully discussed in the text are compiled in the two-page Table 2. Figs. 19 - 21 show the self-diffusion coefficients of iron in wüstite, magnetite, and hematite. Table 3 gives an experimental-theoretical comparison. The last part of the paper

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deals with the diffusion in complex oxide compounds and refractories, and gives a large number of numerical data (Table 4). Finally it is stated that the experiments confirm the function $D=D_0 \exp(-Q/RT)$.

Only some oxides deviate. P. L. Gruzin, A. A. Zhukhovitskiy, A. I. Andriyevskiy, N. N. Karelin, A. V. Sandulova, and M. I. Yurkevich are mentioned. There are 24 figures, 4 tables, and 83 references: 31 Soviet, 15 German, 9 US, 4 Scandinavian, 4 British, 14 Swedish, and 1 French.

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B016/B054

AUTHORS: Likhtman, V. I., Gorbunov, N. S., Shatalova, I. G., and Rebinder, P. A., Academician

TITLE: On the Solidification by Vibration in Powder Metallurgy

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5, pp. 1150-1152

TEXT: The application of powder-metallurgical methods is much impeded by the high pressures required for pressing, particularly if the powders are highly disperse. Also the small amounts of surface-active lubricants acting favorably to a certain degree and counteracting the relaxation of elastic stresses (Ref. 1) are unable to encounter the cracking of pressed pieces at high ram pressure. In their investigation, the authors proceeded from the results of application of vibration to the production of building materials (Ref. 2). They present the results of application of vibration to the pressing of various powders used in powder metallurgy. The vibration source used was a mechanical vibrator of the type V-116 (I-116) with a frequency of 14,000 vibrations per minute, and a vibrational

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On the Solidification by Vibration in Powder Metallurgy

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amplitude of 0.03 mm, which was found to be most favorable. Fig. 1 shows a diagram of the vibrator mentioned (vibropress). Fig. 2 shows the time dependence of the density of pressed pieces of powder mixtures as they are used in hard-metal production. Hence, it appears that 10 seconds are sufficient to attain maximum density. For various metal powders, and for their mixtures with nonmetallic powders, optimum duration of vibropressing lies between 4 and 10 sec. The dispersity of the powder, and particularly its fractional composition, are of high importance. Coarse powders can be better pressed than fine ones. Particularly good results were obtained in vibropressing with a polydisperse powder containing both coarse and fine particles within a wide range of sizes. The authors also studied the pressure dependence of the density of pressed pieces in vibropressing. The results were compared with those of ordinary static and hydrostatic pressing. Figs. 3 and 4 give such data for mixtures of titanium- and tungsten carbide with cobalt, which are used for the production of hard metals of the types BK 6 (VK6), BK20 (VK20), T15K6 (T15K6), and T30K4 (T30K4). For the first two types (with 6 and 20% by weight of Co, respectively, rest: tungsten carbide), the ram pressure could be reduced to about 1/100 with the application of vibration. Conditions were similar