GEL'BSHTEYN, A.I.; STROYEVA, S.S.; KUL'KOVA, N.V.; BAKSHI, Yu.M.; LAPIDUS, V.L.

Mechanism of the catalytic reactions in the partial oxidation and oxidative ammonolysis of propylene in the presence of MoO_3--Bi_2O_3. Neftekhimiia 5 no.1:118-125 Ja-F '65. (MIRA 18:5)

1. Nauchno-issledovatel'skiy fiziko-khimicheskiy institut imeni Karpova, Moskva.

SILING, M.I.; GEL'BSHTEYN, A.I.

Use of adsorption methods in studying catalysts for vapor-phase synthesis of vinyl acetate. Kin. i kat. 6 no.4:717-724 Jl-Ag '65. (MIRA 18:9)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova, Moskva.

SILIN, [illegible] PEREYN, A.I.

Role of carbon as a carrier in some cases of catalysis. Zhur. fiz. khim. 39 no.8:2042-2043 Ag '65. (MIRA 18:9)

1. Moskovskiy fiziko-khimicheskiy institut imeni Karpova.

OSTROVSKIY, G.M.; VOLIN, A.N.; [illegible]

Use of nonlinear programming methods for determining the kinetic equation constants for the synthesis of acrylic acid nitrile. Khim. prom. 41 no.1:31-37 Ja '65.

(MIRA 18:3)

GEL'BSHTEYN, A.I.; BAKSHI, Yu.M.; STROYEVA, S.S.; KUL'KOVA, N.V.; LAPIDUS, V.L.; SADOVSKIY, A.S.

Kinetics and mechanism of oxidative ammonolysis and partial oxidation of propylene on bismuth-molybdenum catalysts. Kin. i kat. 6 no. 6:1025-1032 N-D '65 (MIRA 19:1)

1. Fiziko-khimicheskiy institut imeni Karpova. Submitted July 28, 1964.

GEL'BSHTEYN, I., inzhener.

Lightweight hoist. Stroitel' no.7:21 J1 '57. (MIRA 10:9)
(Hoisting machinery)

SKVORTSOV, S.G., inzh.; BYKOVSKIY, O.P., inzh.; VASINA, I.N., inzh.; VORONIN, A.D., inzh.; GRL'BSHTEYN, I.Ye., inzh.; POLYAKOV, L.L., inzh.; GRECHUSHNIKOV, G.A., inzh., red.

[Catalog of designs of stands, construction yards, equipment and devices for making prestressed reinforced concrete elements] Al'bom-katalog proektov stendov i poligonov, oborudovaniia i prisposobleniі dlia izgotovleniia predvaritel'no napriashennykh zhelezobetonnykh konstruktsii. Moskva, TSentr. biuro tekhn. inform. No.MZh-2. 1957. 118 p. (MIRA 11:10)

1. Akademiya stroitel'stva i arkhitektury SSSR. Nauchno-issledovatel'skiy institut tekhnicheskoy pomoshchi stroitel'stvu.
(Prestressed concrete)

GEL'FSHTEYN, M. I.

GEL'FSHTEYN, M. I. - "Pathological Anatomy and Pathology of Experimental Intoxication by Aniline." Sub 6 Jan 52, Acad Med Sci USSR. (Dissertation for the Degree of Candidate in Medical Sciences).

SO: Vechernaya Moskva January-December 1952

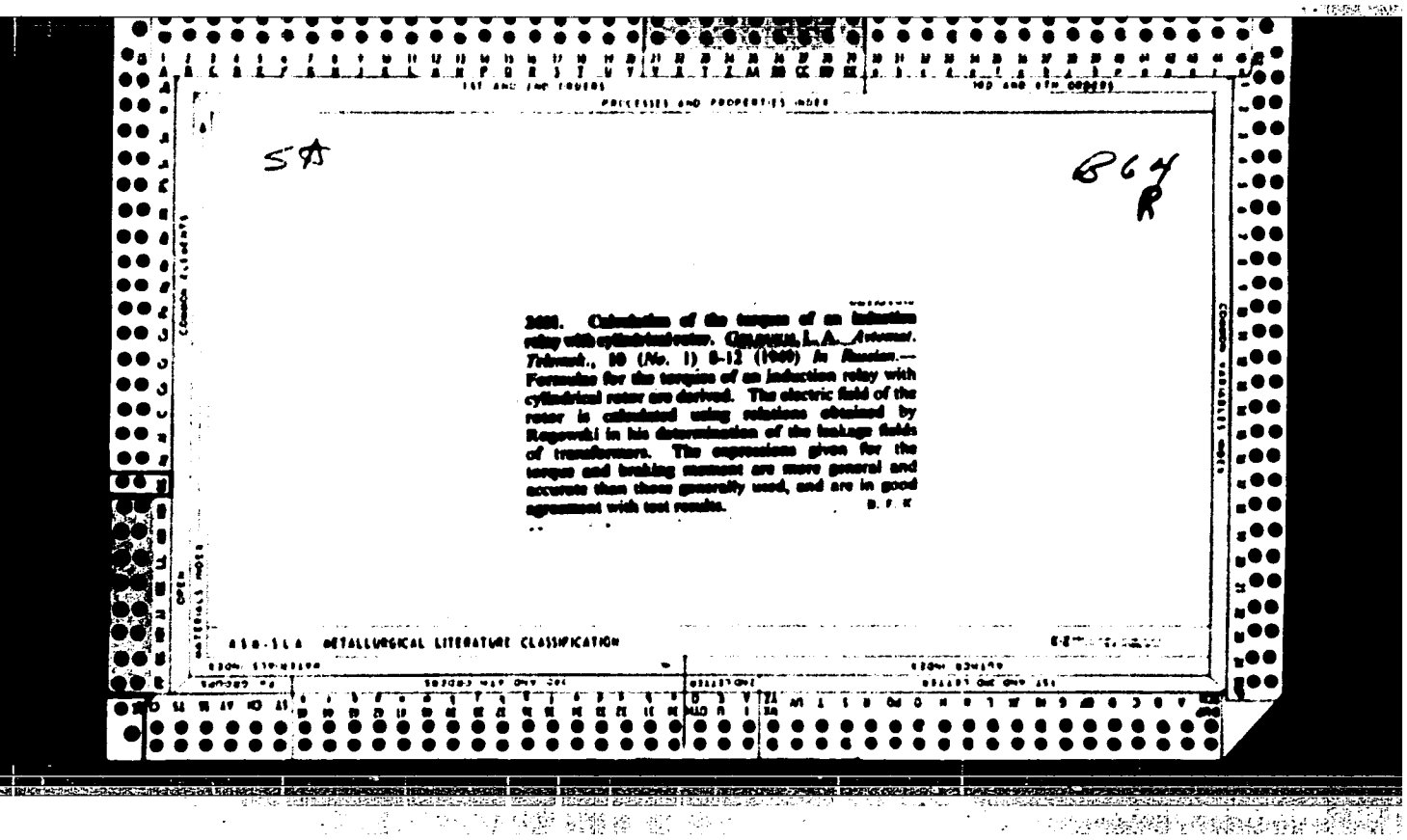
GOL'BERT, Z.I.; OBUKHOV, N.V.

Autoradiohistographic study of the absorption of radioactive iodine by thyroid gland tumors. Med. rad. 8 no.9:34-40 '63. (MIRA 17:4)

1. Iz patologoanatomicheskogo otdeleniya (zav. - kand. med. nauk Z.V. Gol'bert) i radiologicheskogo otdeleniya (zav. - kand. med. nauk M.I. Volkova) Gosudarstvennogo onkologicheskogo instituta imeni P.A. Gertsena.

BESSONOV, A.N.; GEL'BUKH, L.A.; YELISTRATOV, I.F.; SMIRNOV, V.A.; TARSKIY, Yu.S., kapitan 2 ranga, red.; CHAPAYEVA, R.I., tekhn. red.

[Underwater search] Podvodnyi poisk. Moskva, Voenizdat, 1963. 93 p. (MIRA 16:10)
(Diving, Submarine) (Underwater television)
(Underwater acoustics)



5A

B64
R

3001. Calculation of the torques of an induction relay with cylindrical rotor. Gruszeski, L. A. *Avtomat. Telemekh.*, 10 (No. 1) 8-12 (1949) *In Russian.*— Formulas for the torques of an induction relay with cylindrical rotor are derived. The electric field of the rotor is calculated using relations obtained by Rogowski in his determination of the leakage fields of transformers. The expressions given for the torque and braking moment are more general and accurate than those generally used, and are in good agreement with test results. B. F. K

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

GOL'BUKH, L. A.

USSR/Electricity - Bus Bars
Inductance

Aug 50

"Calculating the External Inductance of Thin Rectangular Steel Bus Bars," Docent A. M. Vinitskiy, Cand Tech Sci, L. A. Gol'bukh, Cand Tech Sci, Khar'kov

"Elektrichestvo" No 8, 37-39

Gives deductions from formulas for external inductive reactance of thin rectangular steel bus bars. Formulas deduced agree well with experiments.

PA 167T23

GEL'BUKH, L. A.

178T48

USSR/Electricity - Control Circuits Feb 51
Transients

"Analysis of the Operation of an Induction Power-Directional Relay With a Cylindrical Rotor in Transient Processes," L. A. Gel'bukh, Cand Tech Sci, Khar'kov Elec Eng Inst

"Elektrichestvo" No 2, pp 21-25

Investigates action of single-phase induction power-directional relay with cyl rotor resulting from transient currents in its windings during fault. Proves nonselective operation of the relay is possible under large voltage changes. This

[redacted] 178T48

USSR/Electricity - Control Circuits (Contd) Feb 51

can be prevented by connecting capacitance and effective resistance in the voltage winding. Submitted 10 Aug 49.

[redacted] 178T48

GEL'BUKH, L. A.

USSR/Electricity - Induction Heating Arc Quenching

Sep 52

"Motion of a High-Frequency Electric Arc in an Arc-Quenching Grating," Prof O. B. Bron, Dr Tech Sci, L. A. Gel'bukh, Cand Tech Sci, Leningrad

"Elektrichestvo" No 9, pp 7-12

Discusses electrodynamic forces acting on a hf elec arc in an arc-quenching grating. Shows that effects arising in the quenching of a hf arc by a grating are essentially different from those occurring in the quenching of a dc or power-frequency

232T48

arc, imposing new requirements on the design of switching equipment for hf currents. Submitted 8 Dec 52.

232T48

AUTHOR GEL'BUKH L.A.

PA - 2546

TITLE Calculation of Induced Magnetic Moment of Ferromagnetic Ellipsoid of Rotation under Alternating Magnetic Field. (Raschet indutsirovannogo magnitnogo momenta ferromagnitnogo ellipsoida vrashcheniya v peremennom magnitnom pole.-Russian)

PERIODICAL Zhurnal Tekhn. Fiz. 1957, Vol 27, Nr 3, pp 548 - 559 (U.S.S.R.)

Received: 4/1957 Reviewed: 5/1957

ABSTRACT As with magnetizing there is always a partial dragging in of the lines of the magnetic field into the object, Ralley's formulae give rise to considerable errors for ferromagnetic bodies on the occasion of the calculation of the magnetic moments. An approximated calculation method is suggested and a marked occurrence of the surface effect is assumed. The voltage of the exterior field is determined by the vector H_o, which can be divided into the components H_a in the longitudinal and H_b in the transversal axis of the ellipsoid. Accordingly, the induced magnetic moments will be m_a and m_b. Neyman's method with due modifications is applied. The strata thickness $\delta\mu$ with an evenly distributed magnetizing intensity is inserted instead of the shell thickness. The magnitude is determined and then the correctness of the approximated method is checked by exakt compulation.

CARD 1/2

induction currents. The approximated method, however, [illegible] give any phase relations between these moments. The result obtained can also be generalized for bodies of a different shape. Next, the magnetic moments of the longitudinal and of the transversal components of the magnetic field are compished. The equations obtained define both components completely. If

$\delta \to 0$ and $\frac{\delta}{\mu_0} \to \infty$ are inserted, the formulae by Ralley and those fpr the magnetic moment of the ferromagnetic ellipsoid in a static field are obtained. Thus the correctness of the method shown here is proved. ($\delta\mu$ magnetic transparency). (With five illustrations)

ASSOCIATION: not given.

PRESENTED BY: -

SUBMITTED: 20.7. 1956.

AVAILABLE: Library of Congress.

CARD 2/2

105-58-3-12/31

AUTHOR: Gel'bukh L. A. , Candidate of Technical Sciences (Leningrad)

TITLE: Heating of a Ferromagnetic Ellipsoid in an Alternating Magnetic Field (Nagrev ferromagnitnogo ellipsoida vrashcheniya v peremennom magnitnom pole)

PERIODICAL: Elektrichestvo, 1958, Nr 3, pp. 50 - 51 (USSR)

ABSTRACT: Here, the heating of stretched bodies by means of induction is investigated, viz. of such bodies, which can be replaced by equivalent ellipsoids. In this way the influence of the finite dimensions of the body upon the energy, which is necessary for its heating, can be taken into consideration. It is assumed that the exterior magnetic field is everywhere parallel to the great axis of the ellipsoid. It is assumed that the surface effect appears intensely. The computation is carried out for the constant magnetic permeability μ and for the specific electroconductivity γ of the material, taking into consideration the hysteresis losses. The problem is solved by means of the method proposed by L. R. Neyman (Reference 5). The investigated body is replaced by a ferro-

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Heating of a Ferromagnetic Ellipsoid in an Alternating Magnetic Field

magnetic cover with a thickness $\delta_{equivalent}$ being equivalent to the depth of penetration of the electromagnetic wave into the metal. The metal is located in the static magnetic field of equal strength. This cover weakens the exterior field acting as a ferromagnetic screen. In the case of an alternating field the eddy currents within the cover must behave in such a way that they completely compensate the residual field in the interior of the ellipsoid. After having computed the amperage, the energy delivered in heating by means of induction can be obtained. In Reference 5 it was shown that for the case of a ferromagnetic sphere in the alternating field the results of computation according to this approximated method agree well with the results of the computation according to the exact method. This permits to apply the approximated method in the case of an ellipsoid as well. The thickness of the wall is assumed with

$$\delta_{equivalent} = \sqrt{2/\omega\mu\gamma}$$

where ω denotes the angular velocity of the electromagnetic wave. For the purpose of simplifying the computation a cover formed by two confocal ellipsoids is investigated, instead of

Heating of a Ferromagnetic Ellipsoid in an Alternating Magnetic Field

the elliptic hollow space with equal wall strength. It is shown that in the case of a greatly stretched ellipsoid intensely showing the surface effect, the volumes of the cover are equal, if the thickness of the cover in the equator plane $\delta = 3\pi/8\ \delta_{equivalent}$. For this case the strength of the magnetic field H_i inside the hollow space (Reference 6) can be determined: Equation (3). If H_i is known, it is not difficult to compute the linear current density within the cover (per unit meridian length), which is necessary for compensating this field strength. Finally, the equation (8) for the energy absorbed by the ellipsoid is derived. Then an example is computed. There are 2 figures and 6 references, all Soviet.

SUBMITTED: June 28, 1957

Card 3/3

SOV/49 -58-10-4/15

AUTHOR: Gel'bukh, I. A.

TITLE: ~~A Calculation of~~ a Settled Field Due to the Polarization of Oblate and Prolate Spheroids (Raschet ustanovivshegosya polya vyzvannoy polyarizatsii tel, imeyushchikh formu vytyanutogo i szhatogo sferoidov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 10, pp 1192-1201 (USSR)

ABSTRACT: Ref.1 considers the fields due to polarization of spherical bodies. The spheroids considered in this article are assumed to be situated in uniform electric fields E. The conductivity of the spheroid is γ_i and of the medium γ_e. The prolate spheroid is considered first using the coordinate system proposed in Refs. 2 and 3, which is connected with Cartesian coordinates by the relations (1), (2) and (3). $\mathcal{E}_a$ and $\mathcal{E}_b$ denote the induced polarization in cross-sections along major and minor semi-axes of the spheroid. Hence the components of induced polarization ($\mathcal{E}_x$, $\mathcal{E}_z$) at any point (η_0, ξ) can be written in the form Eqs.(6) and (7). For small current densities (up to 1-2 ma/cm^2, see (Ref.1)), $\mathcal{E}_a$ and $\mathcal{E}_b$ can be considered pro-

Card 1/5

A Calculation of a Settled Field due to the Polarization of Oblate and Prolate Spheroids

portional to the normal current density at the corresponding points on the surface. The potential of the external applied field due to the component E_x can be written as Eq.(12), if the plane $x = 0$ is considered as having zero potential. Similarly, the potential due to E_z can be written in the form Eq.(13). The disturbed field potential can be expressed inside the spheroid by a solution of the type Eq.(11) and outside by the type Eq.(10). This gives longitudinal and transverse fields of the form Eqs.(14) and (15). The boundary conditions at the surface ($\eta = \eta_c$) are Eqs.(16) and (17). These transform to Eq.(19) (to determine the arbitrary constants (A and B)) and can be solved in the form Eq.(20). For very elongated spheroids ($\eta_c > 1$) the functions P_1 , Q_1 , P_1' , Q_1' , which appear in the foregoing equations, can be expressed by the approximations shown.

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Substituting these into Eq.(20) gives Eqs.(21) and (22) for A and A' . Putting these values of A and A' in the first of the equations determines the resulting potential outside the spheroid. This represents the sum of the potential due to induced polarization and the potential due to the field disturbance caused by the different conductivity of the body and medium. If k_p is put equal to zero in these equations, the coefficients A_p and A'_p now refer to the induced polarization field only. At large distances from the body, the induced polarization can be regarded as due to two mutually perpendicular dipoles directed along the x and z axes. The electric moments of these dipoles can be determined by the approximation that, at distant points, the spheroidal coordinates can be considered as spherical polars. In this case the potential is represented by the equations (25') and (26') which are compared to the normal equations for such a dipole (25") and (26") . This gives Eqs.(27) and (28) for the moments. If the conductivity of the body is considerably greater than that of the medium $(\gamma_i \gg \gamma_e)$,

A Calculation of a Settled Field dud to the Polarization of Oblate and Prolate Spheroids

then Eqs.(27) and (28) simplify to the forms (27') and (28'). Next the induced polarization of an oblate spheroid is considered (Fig.2). The coordinate system, in this case, is connected with Cartesian coordinates by the relations Eqs. (29) and (30). As before, the induced polarization can be expressed in terms of the formulae (33) and (34) and, in the same manner, $\mathcal{E}_b$ and $\mathcal{E}_a$ are represented by Eqs.(35') and (36'). The disturbed field potential outside is determined by expressions of the type Eq.(37) and, inside, by expressions of the type Eq.(38). Hence the longitudinal field is represented by Eqs.(39) and (40) and the transverse field by Eqs.(41) and (42). Eq.(45) gives the final value for the coefficient A and there is an analogous equation for A'. For very flattened spheroids ($\eta_0 \ll 1$) the functions $P_1(j\eta_0)$, $\varphi_1(j\eta_0)$, etc., can be represented by the approximate forms shown. Using these approximations, the

A Calculation of a Settled Field due to the Polarization of Oblate and Prolate Spheroids

coefficients A and A' can be written as Eqs.(46) and (47). The coefficients A_p and A'_p for the potential of the induced polarization field can be found, as before, by putting $k_p = 0$. Thus, the potentials of the induced polarization for oblate spheroids can be expressed by Eq.(50) for the longitudinal field (along the minor axis), and Eq.(51) for the transverse field (along the major axis). As before, at great distances from the body, the coordinates can be regarded as spherical polars. The two electric dipole moments, in this case, can be represented by Eqs.(52) and (53), which transform to Eqs.(52') and (53'), if $\gamma_i \gg \gamma_e$.

There are 3 Soviet references (2 being translated from English), and 2 figures.

SUBMITTED: February 11, 1957.

Card 5/5

57-28-3-23/33

AUTHOR: Gel'bukh, L. A.

TITLE: The Computation of the Induced Magnetic Moment of a Flattened Ferromagnetic Ellipsoid of Revolution in an Alternating Magnetic Field (Raschet indutsirovannogo magnitnogo momenta szhatogo ferromagnitnogo ellipsoida vrashcheniya v peremennom magnitnom pole)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 3, pp.592-598 (USSR)

ABSTRACT: With reference to the previous paper (Reference 1) the analogous problem for a flattened spheroid is here investigated according to the same method. It is assumed that it is located in a homogeneous alternating field H_0. H_0 can be separated into an axial component H_b and a radial one H_a. According to the method employed here the induced magnetic moments of magnetization and of the induction currents are computed. The magnetization moment here is equal to the magnetic moment of the envelope of two confocal spheroids in

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The Computation of the Induced Magnetic Moment of a Flattened Ferromagnetic Ellipsoid of Revolution in an Alternating Magnetic Field

a static magnetic field of equal strength. The moment of the induction currents is equal to the moment developing in the case of a complete envelopping of the superconducting spheroid by the field whose strength is equal to that of the static residual field within the envelope. Equation (3) for the thickness δ of the envelope is derived:

$$\delta = 1{,}06 \sqrt{2/\omega\mu\gamma}$$

μ denotes the magnetic permeability, γ the specific electric conductivity and ω - the alternating-current circuit frequency. The equations for H_b and H_a are derived where δ is determined from formula (3). The formulae (40 - 43) obtained for H_b and H_a completely determine the magnitude and the phase of the two components and therefore also the magnitude and the phase of the entire induced magnetic moment. There are 2 figures, and 3 Soviet references.

SUBMITTED: December 14, 1956

Card 2/2 1. Bodies of revolution--Magnetic moments 2. Magnetic fields --Analysis 3. Mathematics

GEL'BUKH, L.A., kand.tekhn.nauk (Leningrad)

Possibilities of detecting conducting ferromagnetic objects in ferromagnetic substances. Elektrichestvo no.7:69-72 Jl '60. (MIRA 13:8)

(Ferromagnetism)

GEL'BUKH, T.M.

Experimental study of evaporation from the water surface of small reservoirs. Trudy GGI no.104:60-74 '63. (MIRA 16:7)
(Kustanay Province—Evaporation)

GEL'DERH, T.H.

Evaporation from reed growths in bodies of water. Trudy GGI no.92: 152-174 '64. (MIRA 17:11)

SADYKHOV, I.D.; GURDZHINYAN, L.D.; MAMEDOVA, Z.G.; GEL'BURD, L.I.

Viscosity of cracking residues. Azerb.khim.zhur. no.2:57-61 '61.
(MIRA 14:8)

(Petroleum products—Testing) (Viscosity)

GURDZHINYAN, L.D.; SADYKHOV, I.D.; GUREVICH, V.R.; GRABOVSKIY, Yu.P.; GEL'BURD, L.I.;

Viscosimeter for polyolefin solutions. Azerb. khim. zhur. no.1:23-27 '65. (MIRA 18:7)

1. Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimicheskoy promyshlennosti i VNIIOlefin.

GEL'BURT, B., prepodavatel'

Two inadequate books by the same author. Avt. transp. 37 no.9:60-61 S '59. (MIRA 12:12)
(Juvenile drivers)

GEL'BURT, B., prepodavatel'

"Manual for drivers of the second grade." Reviewed by B.Gel'burt. Za rul. 18 no.3:31 Mr '60. (MIRA 13:6)

1. Uchebnyy kombinat "Glavmosavtotrans."
(Automobile drivers--Handbooks, manuals, etc.)

BESPAL'KO, V., kand.pedagog.nauk; GEL'BURT, B., inzh.

Is the program obsolescent? Za rul. 18 no. 12:7 D '60.
(MIRA 14:1)

1. Nauchno-issledovatel'skiy institut proizvodstvennogo obucheniya (for Gel'burt).
(Automobile drivers)

GEL'BURT, B., inzh.

"Service station" truck. Avt.transp. 39 no.4:50-51 Ap '61. (MIRA 14:[illegible])

(Motor vehicles—Maintenance and repair)

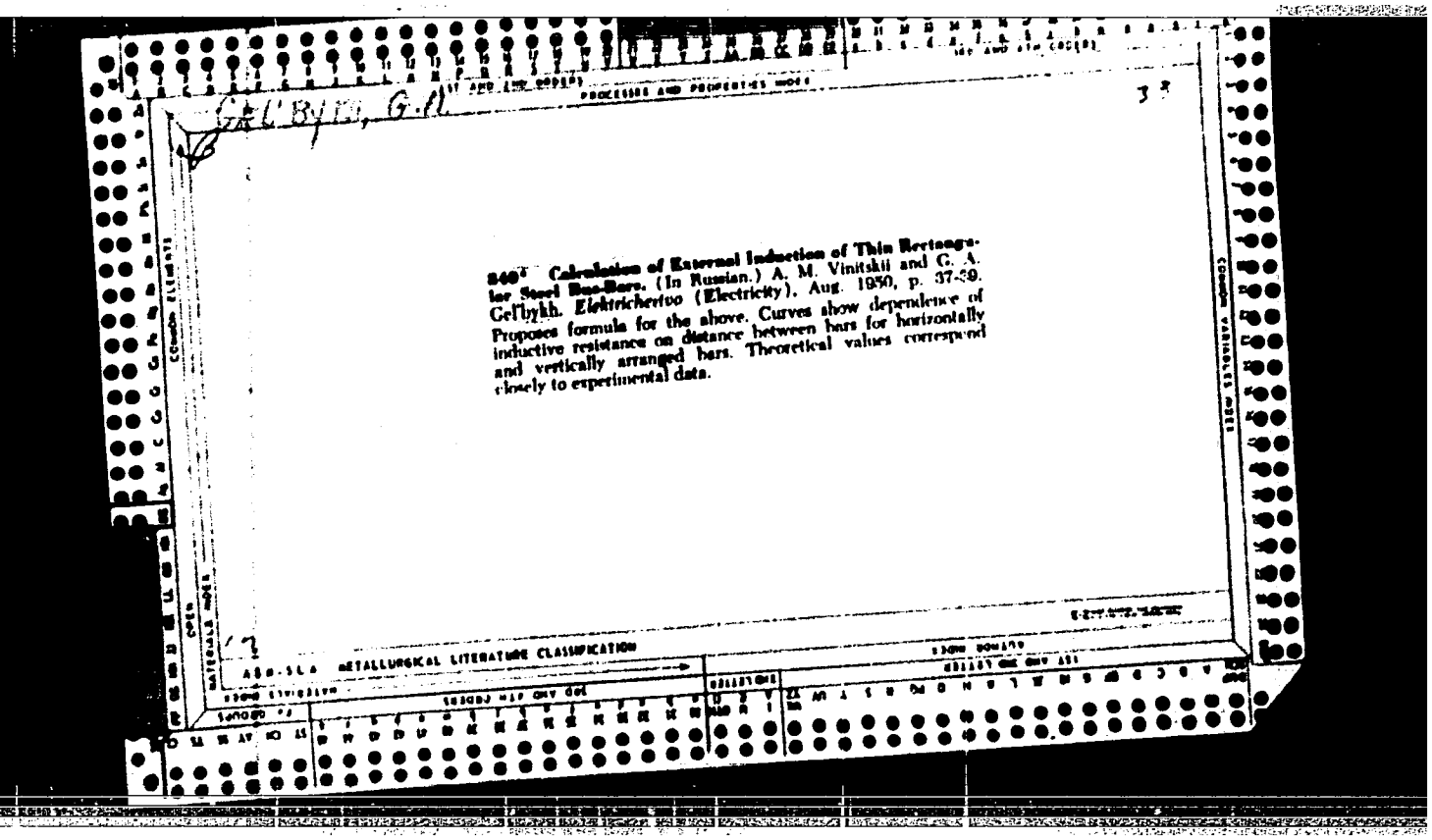
BESPAL'KO, Vladimir Pavlovich; GEL'BURT, Boris Yefimovich; PROTASOVSKIY, Georgiy Aleksandrovich; KASABOV, Sh.M., st. prepod., retsenzent; ZHIDELEV, M.A., kand. ped. nauk, red.; NOVOSELOVA, V.V., tekhn.red.

[Vocational training of automobile repairmen in secondary schools] Proizvodstvennoe obuchenie v srednei shkole professii slesar'-avtoremontchik; metodicheskoe posobie dlia prepodavatelei i instruktorov proizvodstvennogo obucheniia. Pod red. M.A.Zhideleva. Moskva, Izd-vo APN RSFSR, 1962. 237 p. (MIRA 16:6)

1. Kafedra obshchetekhnicheskikh distsiplin i truda Moskovskogo gosudarstvennogo pedagogicheskogo instituta im. V.I. Lenina (for Kasabov).
(Automobiles--Maintenance and repair)

BESPAL'KO, V., kand.pedagog.nauk; GEL'BURT, B., inzh.-pedagog

From simple to complicated problems. Za rul. 20 no.1:16 Ja '62. (MIRA 15:2)
(Motor vehicles--Study and teaching)



3 2

3403 **Calculation of External Induction of Thin Rectangular Steel Bus-Bars.** (In Russian.) A. M. Vinitskii and G. A. Gel'fykh. *Elektrichestvo* (Electricity), Aug. 1950, p. 37-39. Proposes formula for the above. Curves show dependence of inductive resistance on distance between bars for horizontally and vertically arranged bars. Theoretical values correspond closely to experimental data.

METALLURGICAL LITERATURE CLASSIFICATION

GMIL'CHINSKIY, B.Ya.

Obtaining reflection formulas from wave equations for the spherical Earth. Uch. zap. LGU no.146:101-120 '52. (MIRA 11:3)
(Radio waves)

GEL'CHINSKIY, B.YA.

16(1) PHASE I BOOK EXPLOITATION SOV/2660

Vsesoyuznyy matematicheskiy s"yezd. 3rd, Moscow, 1956

Trudy. t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: G.N. Shevchenko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.M. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Yu. V. Prokhorov, K.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, N.G. Chetayev, G. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

Card 22/34

MATVEYEVA, N.N.; SMIRNOVA, Z.M.; KUSTOVA, Z.M.; VASIL'YEVA, M.V.; GEL'CHINSKIY, B.Ya.; OZEROV, D.K.; MANUKHOV, A.V.; GOL'TSMAN, F.M.; PETRASHEN', G.I., red.; VOLKHOVER, R.S., tekhn. red.

[Papers on the quantitative study of seismic wave dynamic] Materialy kolichestvennogo izucheniia dinamiki seismicheskikh voln. Pod. rukovodstvom i red. G.I.Petrashen'. [Leningrad] Izd-vo Leningr. univ. Vol. 1. 1957. 420 p. Vo.2. 1957. 152 p. (MIRA 11:2)

1. Akademiya nauk SSSR. Matematicheskiy institut, Leningradskoye otdeleniye.
(Seismometry)

ALEKSEYEV, A. S., and GELCHINSKIY, B. Ya.

"Successive Approximation in the Ray Theory and its Application in Propagation Problems Involving Boundaries."
"Ray Theory of Intensity and Shape of Leading Waves in an Elastic Medium."

papers presented at the 4th All-Union Acoustics Conf., 26 May - 4 June 1958.

BUROVA, A.V.; VORONIN, Yu.A.; GEL'CHINSKIY, B.Ya.; MANUKHOV, A.V.; PETRASHEN', G.I., red.; VOLKHOVER, R., tekhn.red.

[Materials on a quantitative study of seismic wave dynamics] Materialy kolichestvennogo izucheniia dinamiki seismicheskikh voln. Pod rukovodstvom i red. G.I.Petrashen'. Leningrad, Izd-vo Leningr. univ. Vol.3.[Atlases of graphs representing moduli and arguments of complex reflection-refraction coefficients of elastic waves, directivity functions of basic point sources, coefficients of reflection from a diurnal surface, coefficients of conversion, and nomograms of auxiliary coefficients necessary for computing geometrical divergences of rays] Atlasy grafikov modulei i argumentov kompleksnykh koeffitsientov otrazheniia-prelomleniia uprugikh voln, funktsii napravlennosti osnovnykh tochechnykh istochnikov, koeffitsientov otrazheniia ot dnevnoi poverkhnosti, koeffitsientov konversii i nomogrammy vspomogatel'nykh koeffitsientov, neobkhodimykh dlia vychisleniia geometricheskikh raskhozhdenii luchei. 1958. 323 p. (MIRA 13:1)

1. Akademiya nauk SSSR. Matematicheskiy institut. Leningradskoye otdeleniye.

(Seismology--Tables, etc.)

GEL'CHINSKIY, B. Ya., OSEROV, D. K.

"Methodology of Computing Displacement Fields of Refracted and Reflected Waves"

(New Developments in the Methods and Techniques of Geological Exploration) Leningrad, Gostoptekhizdat, 1958. 423 p. (Series: Its: Sbornik trudov I)

GEL'CHINSKIY, B.Ya.; OZEROV, D.K.

Method for calculating displacement fields of reflected and refracted waves. Trudy VITR no.1:277-308 '58. (MIRA 12:1)
(Seismic waves)

GEL'CHINSKIY, B.Ya.

Some questions concerning the propagation of waves in a homogeneous and isotropic elastic medium. Part 1. Uch.zap. LGU no.246:322-345 '58. (MIRA 12:2)

(Wave motion, Theory of)

20-3-11/59

AUTHOR: Gel'chinskiy, B. Ya.

TITLE: Reflection and Refraction of an Elastic Wave of Arbitrary Shape in the Case of a Curved Interface Between Two Media Boundary (Otrazheniye i prelomleniye uprugoy volny proizvol'noy formy v sluchaye krivolineynoy granitsy razdela)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 3, pp.458 - 460 (USSR)

ABSTRACT: In the applications the problem of reflection and refraction of intermittent waves at an arbitrary interface of two elastic media is of interest. If this problem is examined by the method of geometric optics it is decomposed in a natural way into 2 problems: 1) the determination of the fields of the reflected and refracted waves in the domain of the applicability of geometrical optics of elastic waves and 2) into the study of the (diffracted) head waves. This communication investigated the first problem in zeroth approximation of the method of geometrical optics. In this approximation the principle of the isolated element is valid.

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Reflection and Refraction of an Elastic Wave of Arbitrary Shape in the Case of a Curved Interface Between Two Media Boundary

Further the field of the reflected (refracted) wave in an arbitrary point is determined. The solution of the second problem in the case of an arbitrary parting interface hitherto was not successful. The fields of the shifted waves in the vicinity of the wave fronts are for practical reason set up as a series. The formula for this series contains the eikonal of the corresponding interference. Here the author is interested in the zeroth approximation. In the case of a linear wave the first term of the sum of the above-mentioned series is polarized linearly. Then the solutions of the algebraic system for the coefficients of development are written down. The incident elastic wave is reflected by the curved interface in every point in the same way like a plane wave would be reflected by a surface element, which passes through this point. At the determination of the main part of the field of the reflected (refracted) wave in an arbitrary point the geometrical divergence of the corresponding wave must be considered. For the complex intensity in any given point M a formula is given. Finally terms for the geometrical divergence of the reflected (refracted) wave are written down,

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Reflection and Refraction of an Elastic Wave of Arbitrary Shape in the Case of a Curved Interface Between Two Media Boundary

and discussed. There are 4 references, 3 of which are Slavic.

ASSOCIATION: State University imeni A. A. Zhdanov, Leningrad (Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova)

PRESENTED: July 12, 1957, by V. I. Smirnov, Academician

SUBMITTED: June 21, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Alekseyev, A. S., Gel'chinskiy, B. Ya. 20-118-4-10/61

TITLE: On the Determination of Head Wave Intensity by the Method of Rays in the Theory of Elasticity (Ob opredelenii intensivnosti golovnykh voln v teorii uprugosti luchevym metodom)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 4, pp. 661-664 (USSR)

ABSTRACT: The present paper investigates the intensity and the shape of the head waves occurring at the planar boundary of elastic media in the case of a linearly polarized wave with an arbitrarily shaped head wave striking this boundary. In rectangular coordinates x,y,z let $z>0$ and $z<0$ be two half-spaces, and v_{p1} and v_{s1}, respectively be the propagation velocities of the longitudinal and the transverse waves, respectively, in the half-space $z>0$ containing the elastic medium, ρ_1 denoting the density. The elastic properties of the medium taking up the half-space $z<0$ are denoted by v_{p2}, v_{s2} and ρ_2. The conditions of continuity of the displacements and of the stresses are supposed to be satisfied at the

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On the Determination of Head Wave Intensity by the Method of Rays in the Theory of Elasticity

boundary z = 0. The vectors of the displacements of the waves propagating in this system are represented by series expansions. Such a series expansion represents an unsteady analog to the classical expansions with respect to inverse frequencies. The application of the fields of the incident wave and of the fields newly generated at the boundary must satisfy the conditions of continuity of the displacements and of stresses at z = 0. Using the boundary conditions it is easily possible to determine the amplitudes of all waves newly generated on the plane z = 0. The present communication is limited to the determination of the first terms different from zero of the initially mentioned series expansion. The vector of the displacements of the incident wave is decomposed into two vectors. The boundary conditions corresponding to this case for z = 0 are put down and discussed. A formula is deduced for the intensity of the diffracted wave of the highest order at an arbitrary point of the medium. In the case investigated here waves of the surface type are missing. Such waves only occur, when a number of more than three fronts of head waves are colliding at the point A. There are 1 figure, and 6 references, 5 of which are Soviet.

On the Determination of Head Wave Intensity by the Method of Rays in the Theory of Elasticity

20-118-4-10/61

ASSOCIATION: Leningradskoye otdeleniye Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR (Leningrad Department of the Mathematical Institute imeni V. A. Steklov, AS USSR) Leningradskiy godudarstvennyy universitet im. A. A. Zhdanova (State University imeni A. A. Zhdanov, Leningrad)

PRESENTED: July 12, 1957, by V. I. Smirnov, Member of the Academy

SUBMITTED: June 20, 1957

AVAILABLE: Library of Congress

Card 3/3

32024
S/619/60/000/015/004/004
D039/D112

3.9300 (2406, 1019, 1109, 1327)

AUTHORS: Vavilova, T. I., Gel'chinskiy, B. Ya.

TITLE: A theoretical model of an explosion carried out near the interface

SOURCE: Akademiya nauk SSSR. Institut fiziki Zemli. Trudy, no. 15 (182), Moscow, 1960, Seysmicheskiy effekt podzemnykh vzryvov, 102-108

TEXT: The present article shows that the sign of the first arrival of a longitudinal explosion wave will remain positive even if the center of expansion is located near or on the interface of the elastic constants and that the waves arriving first are of a considerably higher intensity than those following a little later. Based on the general principles of the radial method given by I. G. Petrashen', A. S. Alekseyev, B. Ya. Gel'chinskiy (Ref. 2: Elementarnaya teoriya rasprostraneniya voln [Elementary theory of wave propagation]. V. sb. "Voprosy dinamicheskoy teorii uprugikh voln", vyp. III, izd. LGU, 1958.), the examination of formulae and tables for the refraction factor and the formation of head waves taken from the paper of G. I. Petrashen' (Ref. 3: Materialy kolichestvennogo izucheniya dinamiki seysmicheskikh voln [Data of a quantitative study of the seismic

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A theoretical model of an explosion ...

wave dynamics]. T. 1-3, 1957-1958.), the authors maintain that the sign of the first motion of longitudinal waves arriving first at any point of the medium will be defined by the sign of the function of the source direction. Hence it appears that the direction of the first motions of the u^+, u^- fields of the source, and consequently that of the u field, correspond to the compression wave. Due to the practical importance of the intensity ratio of various longitudinal waves appearing in the case under study, the authors examine the waves corresponding to the longitudinal wave fronts. By the formula

$$u = \frac{1}{2}(u^+ + u^-), \qquad (1)$$

as well as by formulae of the radial method (Ref. 2) a calculation has been developed whose final formulae help to determine the source fields u_I, u_{II}, u_{III}, and u_{IV} for the $\widetilde{P}_q$ wave (front zone I), the $\widetilde{P}_r$ wave (front zone II), the $\widetilde{\widetilde{P}}_r$ wave (front zone III), and the $\widetilde{P}_q\widetilde{P}_r$ wave (front zone IV). The results of the calculation are given in the form of theoretical seismograms

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of longitudinal waves in which each set of curves defines the function of the direction of the source investigated in the case of a predetermined ratio of constants. They show that wave III is weaker than the preceding head wave with a positive first arrival. It is concluded that the distinctive feature of underground explosions, i.e. the positive direction of the first arrival, is also present when the explosion takes place near the plane interface. There are 5 figures and 4 Soviet-bloc references.

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Card 3/3

S/044/62/000/004/068/099
C111/C222

AUTHORS: Alekseyev, A.S., Babich, V.M., Gel'chinskiy, B.Ya.

TITLE: The ray method for calculating the intensity of wave fronts

PERIODICAL: Referativnyy zhurnal, Matematika, no. 4, 1962, 62, abstract 4B289. (Vopr. dinamich. teorii rasprostr. seysmich. voln". 5. L., Leningr. un-t, 1961, 3 - 24)

TEXT: The author briefly describes the fundamentals of the ray method for calculating the intensity of wave fronts in non-stationary problems for the wave equation and the system of dynamic equations of elasticity theory. He also discusses the formulation of individual problems arising from the formal development and mathematical proof of the ray method. The principal results of the paper have been published by the authors in various preceding papers.

[Abstracter's note : Complete translation.]

Card 1/1

GEL'CHINSKIY, B.Ya.

Formula for geometrical divergence. Vop. din. teor. raspr. seism. voln no.5:47-53 '61. (MIRA 14:11)
(Seismic waves)

ALEKSEYEV, A.S.; GEL'CHINSKIY, B.Ya.

Radial method of calculating the intensity of refracted waves.
Vop. din. teor. raspr. seism. volu no.5:54-72 '61. (MIRA 14:11)
(Seismic waves)

S/124/61/000/010/051/056
D251/D301

AUTHOR: Gel'chinskiy, B.Ya.

TITLE: Some questions on the transmission of waves in a homogeneous isotropic sphere

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 10, 1961, 14-15, abstract 10 V97 (Uch. zap. LGU, 1958, no. 246, 322-345

TEXT: A study was made of surface waves excited in a homogeneous isotropic sphere by point sources of oscillation. It is assumed that the forces acting at a source are applied at the initial instant of time and also preserve their magnitude. The components of displacement in a spherical system of coordinates are presented in the form of series arising in the solution of the vector problem in a spherical system by the separation of angular coordinates. The coefficients and time have the form of Mellin integrals. From the solution the surface wave obtained is presented in the form of a

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Some questions...

series. The law of dispersion for high frequencies is obtained. For a rapidly-changing part of the displacement, the series obtained is summed in the case of applied normal and tangential forces and a surface center of expansion. It is known that with a source and a sink situated on the surface of the sphere and dependent on the form of the applied force, discontinuities can be observed in the displacements or their derivatives, while the velocity of transmission of a discontinuity is equal to the velocity of a Rayleigh wave in the boundary of a half-space composed of the same material as the sphere. In the case of normal and tangential forces applied at a pole, the discontinuities have a radial and transverse component of velocity. The latitudinal component is absent in the case of a normal force, and in the case of a tangential force only the derivatives of the displacements have discontinuities, the components themselves being continuous. It is shown that for motion along the surface of the sphere the intensity on the front of the surface wave varies approximately according to the law $(\sin \theta)^{-\frac{1}{2}}$ where θ is the angle of separation of the source from the point under observation. [Abstracter's note: Complete translation]

Card 2/2

TSYMBAL, T.N.; GEL'CHINSKIY, B.Ya.; RUDAKOV, A.G.

Main properties of a wave field, disturbed by the tracking of reflected waves, in the Surkhandar'ya Depression and problems in connection with studying it. Vop. din. teor. raspr. seism. voln no.4:61-78 '62. (MIRA 15:10)
(Surkhandar'ya Valley--Seismic prospecting)

GEL'CHINSKIY, B.Ya.; TSYMBAL, T.M.; OZEROV, D.K.; GOLIKOVA, G.V.

Using the dynamic theory in interpreting seismic material in several regions of Kazakhstan. Vop. din. teor. raspr. seism. voln no.4:7-43 '62. (MIRA 15:10)
(Kazakhstan--Seismic prospecting)

GEL'CHINSKIY, B.Ya.

Dynamic interpretations of seismic observations. Vop. din. teor. raspr. seism. voln no.6:5-10 '62. (MIRA 16:7)
(Seismic prospecting)

L 17222-63
ACCESSION NR: AT3006578 S/2585/62/000/006/0023/0029

45

AUTHOR: Gel'chinskiy, B. Ya.

TITLE: Integral formula relating the dynamic and kinematic parameters of a wave propagated in an axisymmetric medium

SOURCE: Voprosy* dinamicheskoy teorii rasprostraneniya seysmicheskikh voln, no. 6, 1962, 23-29

TOPIC TAGS: integral formula, dynamic wave parameter, kinematic wave parameter, axisymmetric medium, seismic wave, body wave amplitude, explosion intensity, earthquake intensity

ABSTRACT: An approximate formula has been derived for correlating the apparent velocities and amplitudes of a body wave at various observation points. From this formula it is inferred that the dynamic hypothesis of the nature of a wave can be evaluated without prior determination of the parametric values of the model and the execution of the customary involved dynamic computations. The amplified formulas can be applied in the interpretation of experimental seismic data, primarily to check the hypothesis on the

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ACCESSION NR: AT3006578

nature of a recorded wave, but also to produce an experimental diagram of the apparent velocities and the intensity of an explosion or earthquake, provided the time-distance curve of the observed wave is known from previous experiments. "The author considers it a pleasant duty to express his gratitude to D. K. Ozerov, T. I. Vavilova, L. A. Krauklis, and S. Ya. Makarova for their discussion of the results obtained and for carrying out a large number of computations." Orig. art. has: 6 figures and 19 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 27Sep63 ENCL: 00

SUB CODE: AS NO REF SOV: 001 OTHER: 000

Card 2/2

S/020/62/145/002/010/018
B142/B108

3.9300

AUTHORS: Golikova, G. V., Yanovskaya, T. B., and Gel'chinskiy, B. Ya.

TITLE: Amplitude curves of longitudinal seismic waves

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 2, 1962, 315-318

TEXT: The behavior of the amplitude curves with epicentral distances of up to $\Delta = 20^0$ is studied. The effect of the wave velocity profile across the earth's crust on the wave dynamics is explained. Using a radiation formula (zero approximation) (see A. S. Alekseyev, V. M. Babich, B. Ya. Gel'chinskiy, Sborn. Voprosy dinamicheskoy teorii rasprostraneniya seysmicheskikh voln, V, L. 1961) 5 profile variants were calculated. The intensities of the direct, singly, doubly, and triply reflected waves are calculated for all variants. The field curves $u(t,\Delta)$ were obtained from which $\log \frac{A^*(\Delta)}{T}$ was constructed as a function of Δ ($A^*(\Delta)$ is the maximum amplitude of the group of waves arriving during the first 4 sec, T is the period). The dependence of the amplitude curves on the frequency was also studied. It was found that the local differences in

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the structure of the Earth's crust cause large differences in the amplitude curves if the epicentral distance is less than 21°. For this reason, the amplitude curves must be constructed separately for each area, in order to determine the intensity of an earth quake. Furthermore, no mean-value amplitude curve can be used to determine the velocity profile because the dynamic characteristics of the longitudinal waves in the range $\Delta < 15^{\circ}$ depend much more than the kinematic characteristics on the parameters of the crust. Hence, wave dynamics has to be taken into account in determining the profile. There are 2 figures and 1 table. The most important reference is: C. Romney, J. Geophys. Res., 64, No. 10 (1959).

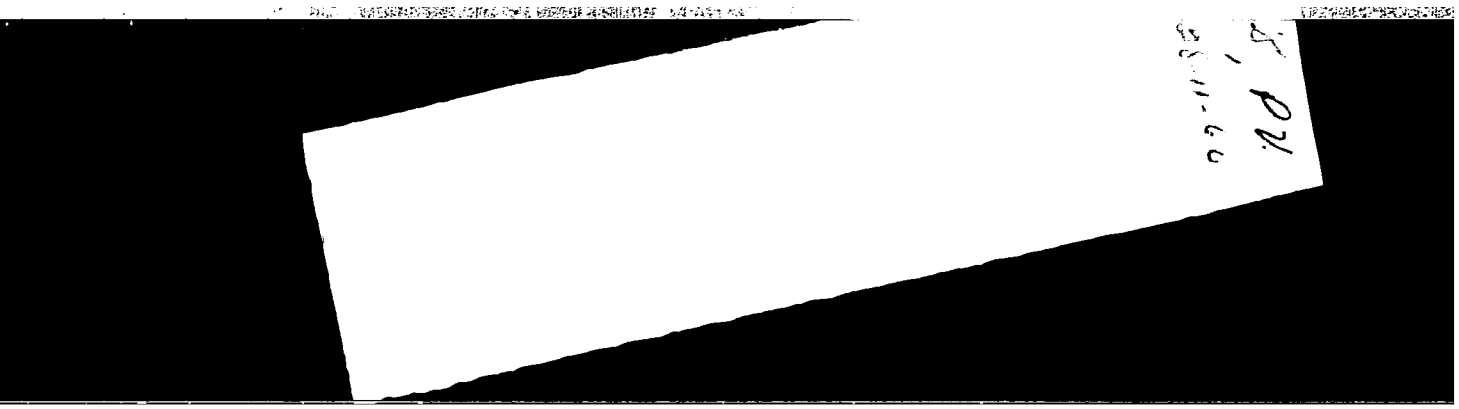
ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University im. A. A. Zhdanov). Leningradskoye otdeleniye Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR (Leningrad Branch of the Institute of Mathematics im. V. A. Steklov of the Academy of Sciences USSR)

PRESENTED: March 13, 1962, by Ye. K. Fedorov, Academician
SUBMITTED: February 26, 1962

GEL'CHINSKIY, B.Ya.; KRAUKLIS, L.A.

Computer algorithm of the correlation process of seismic waves. Vop. din.teor.raspr.seism.voln no.7:115-122 '64.

(MIRA 17:12)



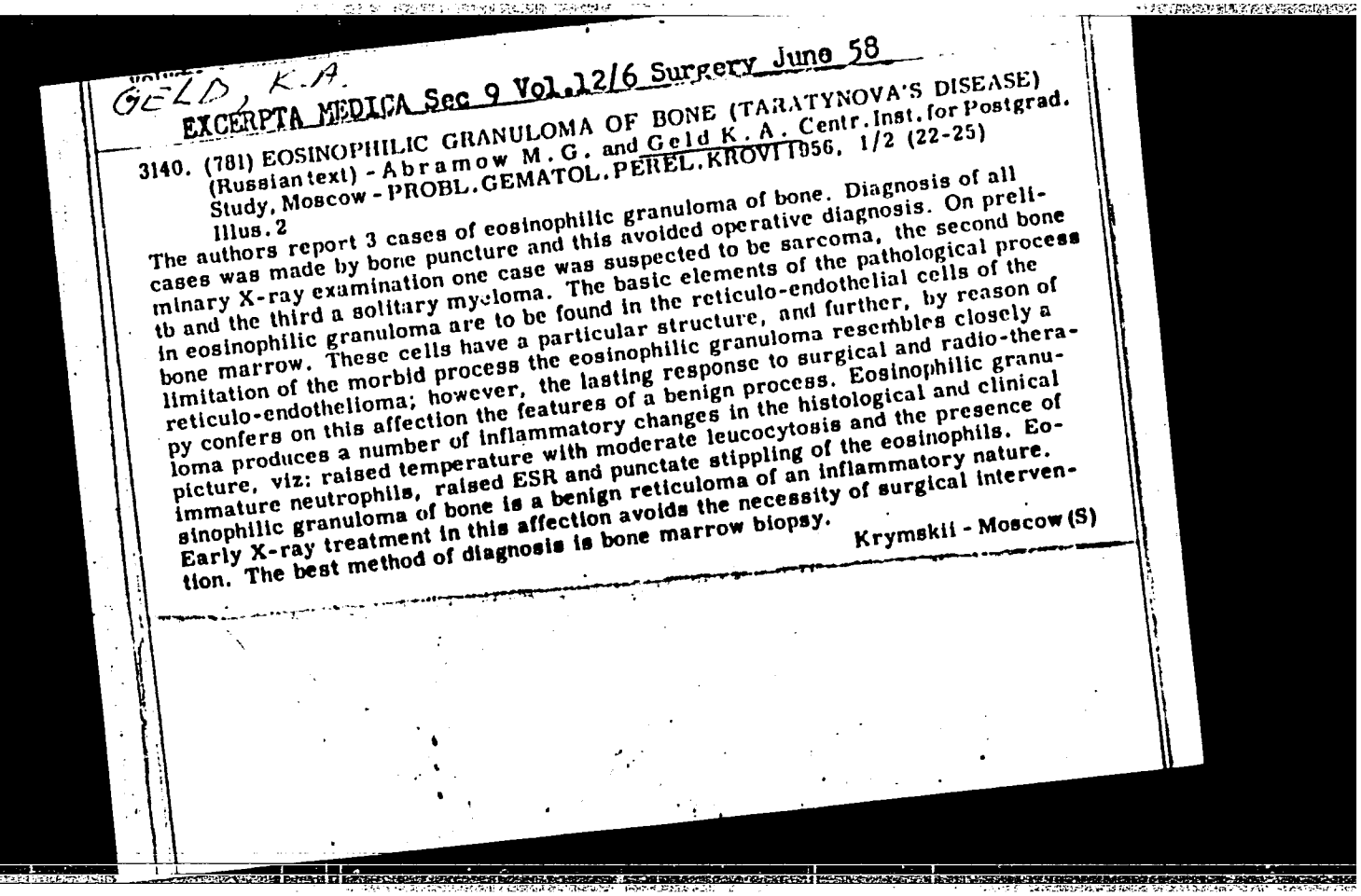
GEL'CHINSKIY, M.L., inzhener; DEMAT, M.P., inzhener; RYAPOLOV, A.F., inzhener; TOKAREV, K.K., inzhener.

Producing and installing thin-walled steel towers. Sbor.mat. o nov. tekh. v stroi. 15 no.6:11-16 '53. (MLRA 6:5)

(Building, Iron and steel)

GEL'CHINSKIY, M.L.; DEMAT, M.P.; RYAPOLOV, A.F.; TOKAREV, K.K.; CHIZHOVA, A.N.; MEDRIGAYLOV, V.G.; VITENBERG, V.I.; KELLER, Ya.K.; KOLOSOV, S.N.; MAKOVITSKIY, B.K.

Drum-pattern for erecting metal towers made of enlarged blocks. Rats. i izobr. predl. v strei. no.119:27-29 '55. (MLRA 9:7)
(Towers)



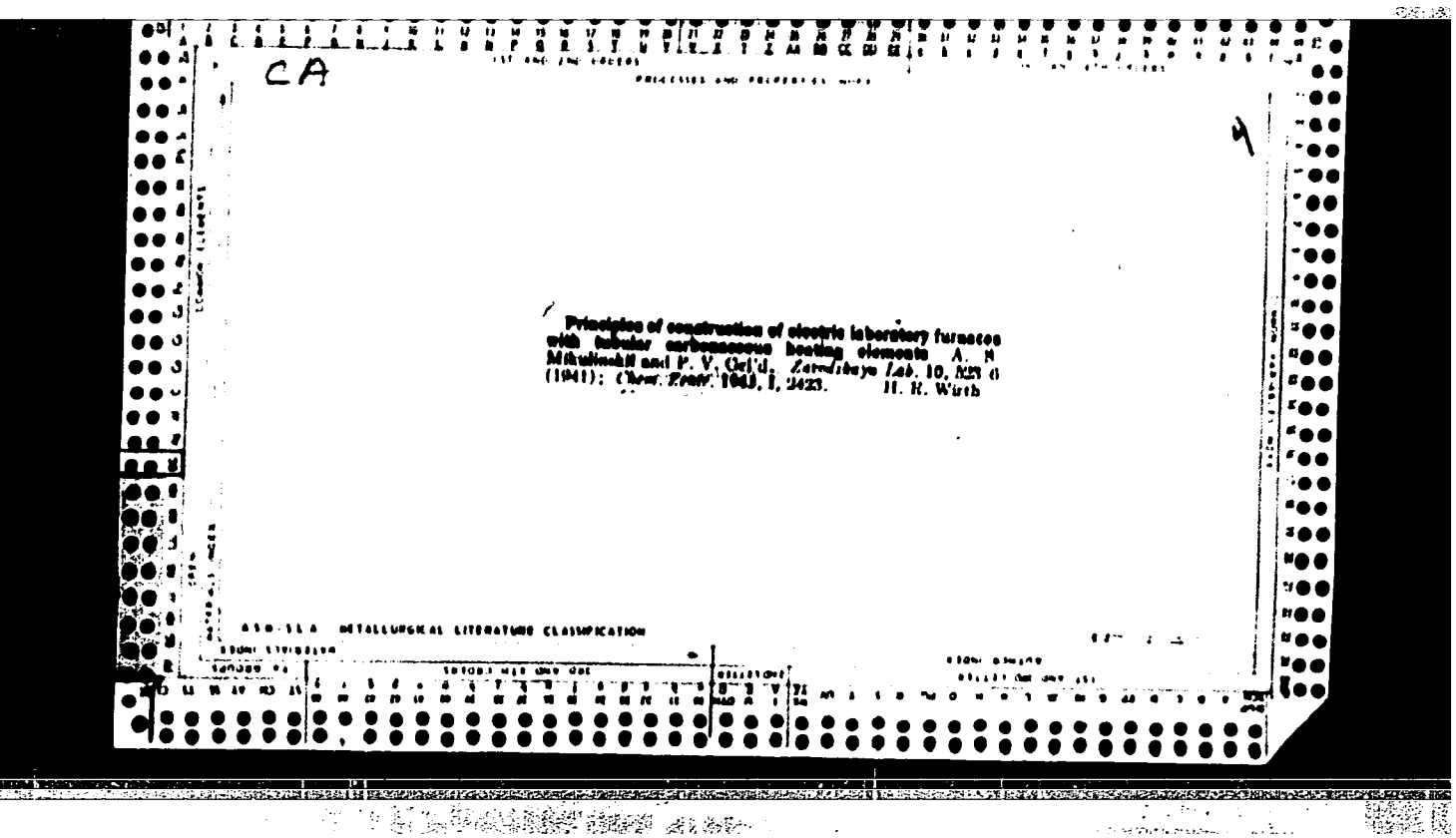
GELD, K.A.

EXCERPTA MEDICA Sec 9 Vol.12/6 Surgery June 58

3140. (781) EOSINOPHILIC GRANULOMA OF BONE (TARATYNOVA'S DISEASE) (Russian text) - Abramow M.G. and Geld K.A. Centr.Inst.for Postgrad. Study, Moscow - PROBL.GEMATOL.PEREL.KROVI 1956, 1/2 (22-25) Illus.2

The authors report 3 cases of eosinophilic granuloma of bone. Diagnosis of all cases was made by bone puncture and this avoided operative diagnosis. On preliminary X-ray examination one case was suspected to be sarcoma, the second bone tb and the third a solitary myeloma. The basic elements of the pathological process in eosinophilic granuloma are to be found in the reticulo-endothelial cells of the bone marrow. These cells have a particular structure, and further, by reason of limitation of the morbid process the eosinophilic granuloma resembles closely a reticulo-endothelioma; however, the lasting response to surgical and radio-therapy confers on this affection the features of a benign process. Eosinophilic granuloma produces a number of inflammatory changes in the histological and clinical picture, viz: raised temperature with moderate leucocytosis and the presence of immature neutrophils, raised ESR and punctate stippling of the eosinophils. Eosinophilic granuloma of bone is a benign reticuloma of an inflammatory nature. Early X-ray treatment in this affection avoids the necessity of surgical intervention. The best method of diagnosis is bone marrow biopsy.

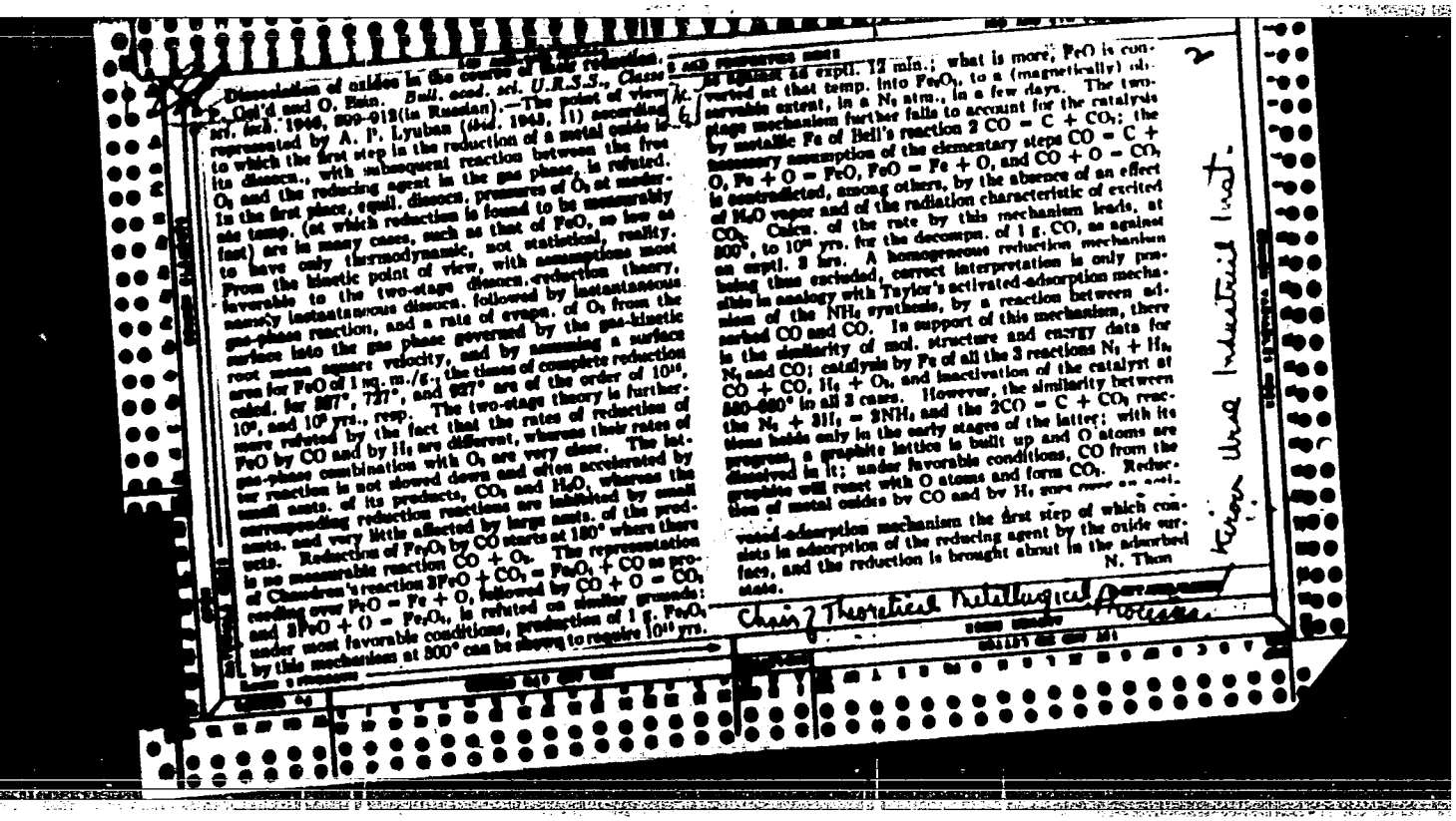
Krymskii - Moscow (S)



CA

4

Principles of construction of electric laboratory furnaces with tubular carborundum heating elements A. N. Mikulinskii and P. V. Gel'd, *Zavodskaya Lab.* 10, No. 6 (1941); *Chem. Zentr.* 1943, I, 2423. H. R. Wirth

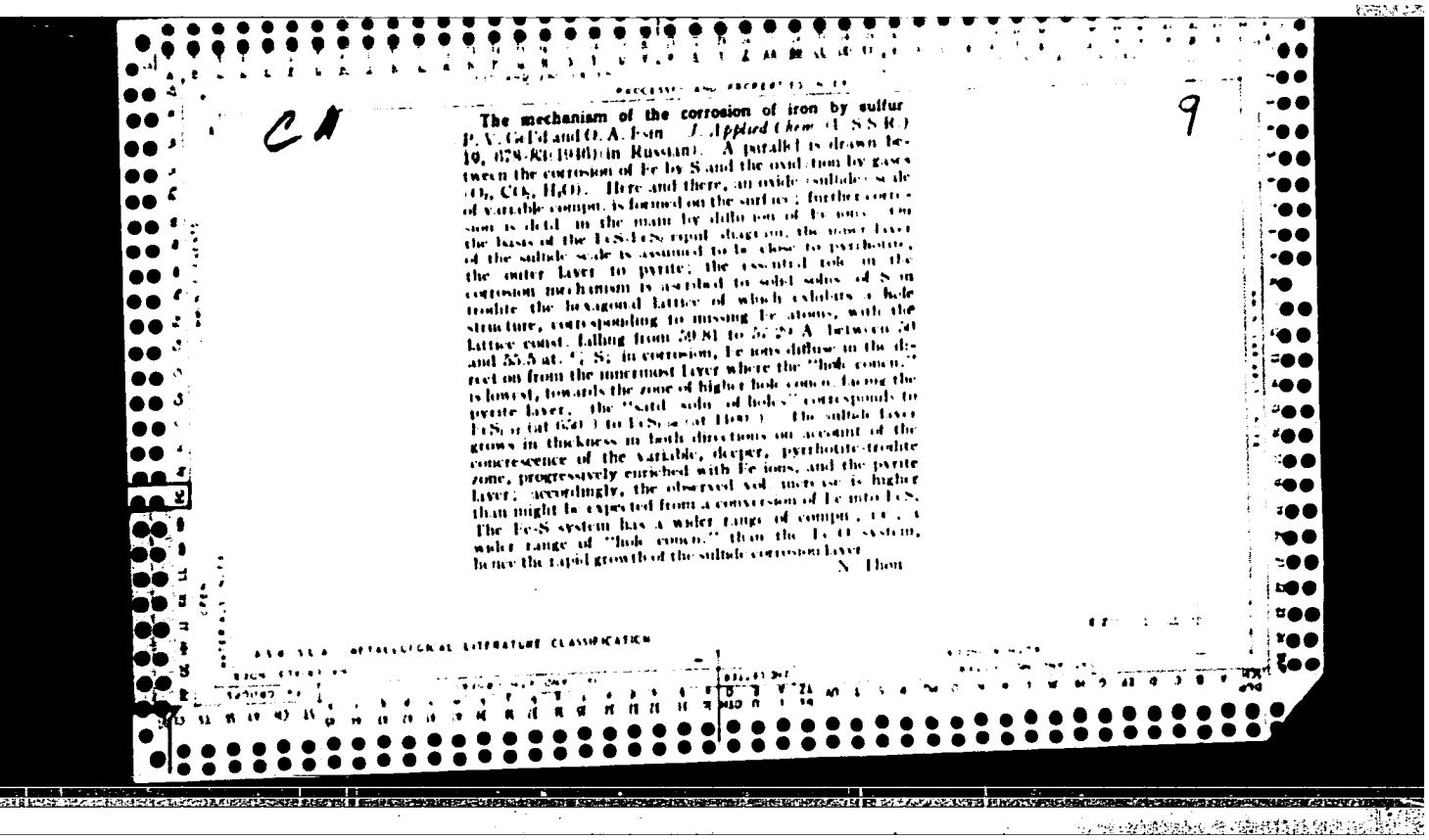


Dissociation of oxides in the course of their reduction.
P. Gel'd and O. Bain. *Bull. acad. sci. U.R.S.S., Classe sci. tech.* 1946, 909-918 (in Russian).—The point of view, to which the first step in the reduction of a metal oxide is represented by A. P. Lyuban (*ibid.* 1943, [1]) according to its dissocn., with subsequent reaction between the free O_2 and the reducing agent in the gas phase, is refuted. In the first place, equil. dissocn. pressures of O_2 at moderate temp. (at which reduction is found to be measurably fast) are in many cases, such as that of FeO, so low as to have only thermodynamic, not statistical, reality. From the kinetic point of view, with assumptions most favorable to the two-stage dissocn.-reduction theory, namely instantaneous dissocn. followed by instantaneous gas-phase reaction, and a rate of evapn. of O_2 from the surface into the gas phase governed by the gas-kinetic root mean square velocity, and by assuming a surface area for FeO of 1 sq. m./g., the times of complete reduction calcd. for 827°, 727°, and 627° are of the order of 10^{15}, 10^{9}, and 10^{5} yrs., resp. The two-stage theory is further refuted by the fact that the rates of reduction of FeO by CO and by H_2 are different, whereas their rates of gas-phase combination with O_2 are very close. The latter reaction is not slowed down and often accelerated by small amts. of its products, CO_2 and H_2O, whereas the corresponding reduction reactions are inhibited by small amts. and very little affected by large amts. of the products. Reduction of Fe_2O_3 by CO starts at 180° where there is no measurable reaction $CO + O_2$. The representation of Chaudron's reaction $3FeO + CO_2 = Fe_3O_4 + CO$ as preceding over $FeO = Fe + O$, followed by $CO + O = CO_2$ and $3FeO + O = Fe_3O_4$, is refuted on similar grounds; under most favorable conditions, production of 1 g. Fe_3O_4 by this mechanism at 800° can be shown to require 10^{10} yrs.

[illegible] expt'l. 12 min.; what is more, FeO is converted at that temp. into Fe_3O_4, to a (magnetically) observable extent, in a N_2 atm., in a few days. The two-stage mechanism further fails to account for the catalysis by metallic Fe of Bell's reaction $2\,CO = C + CO_2$; the necessary assumption of the elementary steps $CO = C + O$, $Fe + O = FeO$, $FeO = Fe + O$, and $CO + O = CO_2$ is contradicted, among others, by the absence of an effect of H_2O vapor and of the radiation characteristic of excited CO_2. Calcn. of the rate by this mechanism leads, at 800°, to 10^{8} yrs. for the decompn. of 1 g. CO, as against an expt'l. 2 hrs. A homogeneous reduction mechanism being thus excluded, correct interpretation is only possible in analogy with Taylor's activated-adsorption mechanism of the NH_3 synthesis, by a reaction between activated CO and CO. In support of this mechanism, there is the similarity of mol. structure and energy data for N_2 and CO; catalysis by Fe of all the 3 reactions $N_2 + H_2$, $CO + CO$, $H_2 + O_2$, and inactivation of the catalyst at 550-650° in all 3 cases. However, the similarity between the $N_2 + 3H_2 = 2NH_3$ and the $2CO = C + CO_2$ reactions holds only in the early stages of the latter; with its progress, a graphite lattice is built up and O atoms are dissolved in it; under favorable conditions, CO from the graphite will react with O atoms and form CO_2. Reductions of metal oxides by CO and by H_2 [illegible] activated-adsorption mechanism the first step of which consists in adsorption of the reducing agent by the oxide surfaces, and the reduction is brought about in the adsorbed state. N. Thon

Chem 2 Theoretical Metallurgical Processes.

Kiev Ukr. Industrial Inst.



CA

9

The mechanism of the corrosion of iron by sulfur

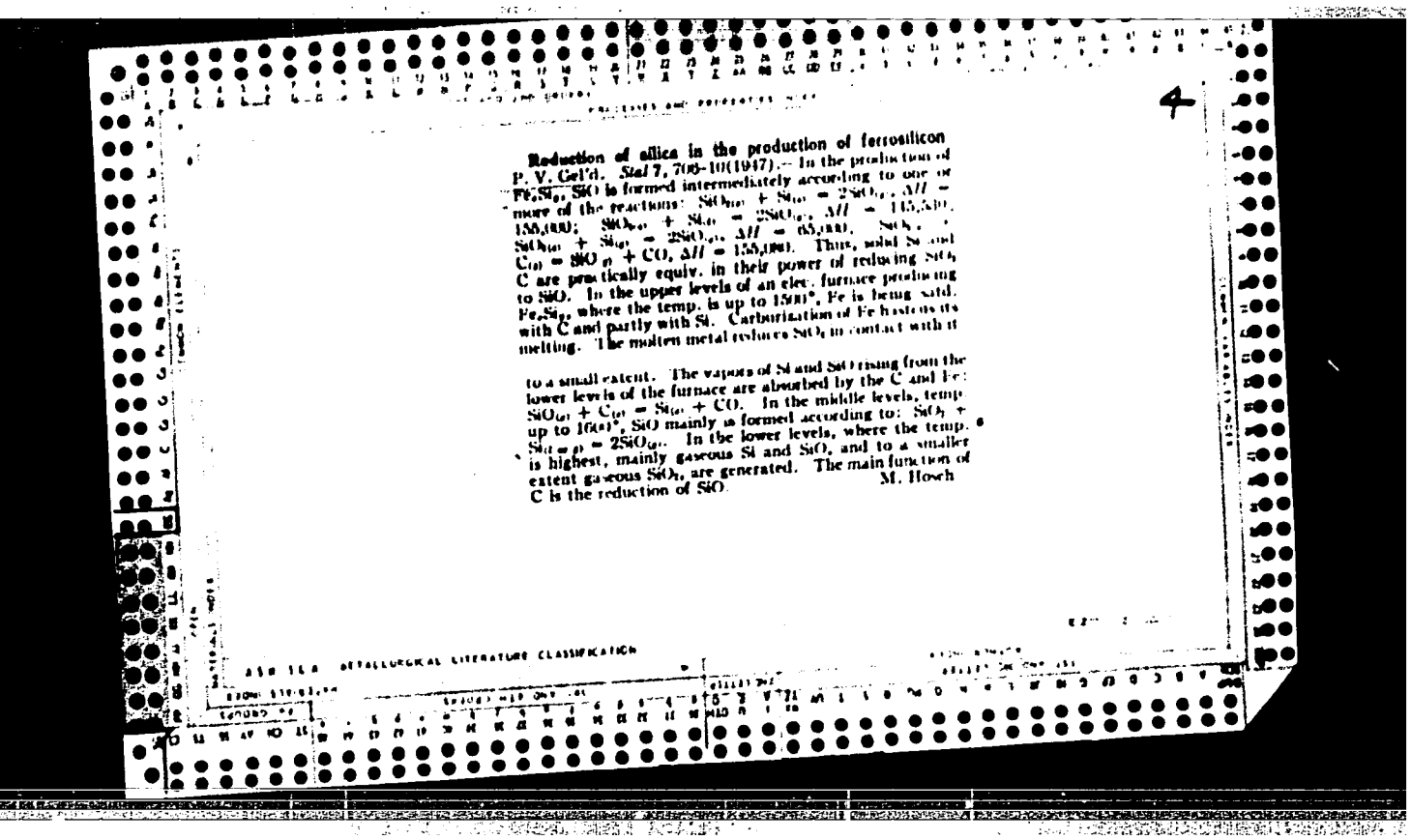
P. V. Gel'd and O. A. Esin *J. Applied Chem.* (U.S.S.R.) 10, 678-82(1937)(in Russian). A parallel is drawn between the corrosion of Fe by S and the oxidation by gases (O_2, CO_2, H_2O). Here and there, an oxide-sulfide scale of variable compn. is formed on the surface; further corrosion is detd. in the main by diffusion of Fe ions. On the basis of the Fe-S-O system, the outer layer of the sulfide scale is assumed to be close to pyrrhotite, the outer layer to pyrite; the essential role in the corrosion mechanism is ascribed to solid solns. of S in troilite, the hexagonal lattice of which exhibits a hole structure, corresponding to missing Fe atoms, with the lattice const. falling from 5.981 to 5.787 A between 50 and 55.5 at. % S; in corrosion, Fe ions diffuse in the direction from the innermost layer where the "hole concn." is lowest, towards the zone of higher hole concn. facing the pyrite layer, the "solid soln. of holes" corresponds to $FeS_{1.47}$ (at 650°) to $FeS_{1.8}$ (at 700°). The sulfide layer grows in thickness in both directions on account of the concrescence of the variable, deeper, pyrrhotite-troilite zone, progressively enriched with Fe ions, and the pyrite layer; accordingly, the observed vol. increase is higher than might be expected from a conversion of Fe into FeS. The Fe-S system has a wider range of compn., i.e., a wider range of "hole concn." than the Fe-O system, hence the rapid growth of the sulfide corrosion layer.

N. Thon

G.M.D., P.V.

YESIN, O.A., professor; GEL'D, P.V., dotsent.

The theory of metallurgical processes. S.T.Rostovtsev.Reviewed by O.A.Esin,P.V.Gel'd. Stal' 7 no.2:188-189 '47. (MLRA 9:1)
(Metallurgy) (Rostovtsev, S.T.)



Reduction of silica in the production of ferrosilicon P. V. Gel'd. *Stal* 7, 708-10(1947).— In the production of Fe_2Si_2, SiO is formed intermediately according to one or more of the reactions: $SiO_{liq} + Si_{liq} = 2SiO_{gas}$, $\Delta H = 155,880$; $SiO_{liq} + Si_{liq} = 2SiO_{gas}$, $\Delta H = 65,880$. $SiO_{liq} + Si_{liq} = 2SiO_{gas}$, $\Delta H = 155,880$. Thus, solid Si and $C_{liq} = SiO_{gas} + CO$, $\Delta H = 155,880$. Thus, solid Si and C are practically equiv. in their power of reducing SiO_2 to SiO. In the upper levels of an elec. furnace producing Fe_2Si_2, where the temp. is up to 1500°, Fe is being satd. with C and partly with Si. Carburization of Fe hastens its melting. The molten metal reduces SiO_2 in contact with it to a small extent. The vapors of Si and SiO rising from the lower levels of the furnace are absorbed by the C and Fe: $SiO_{liq} + C_{liq} = Si_{liq} + CO$. In the middle levels, temp. up to 1600°, SiO mainly is formed according to: $SiO_2 + Si_{liq} = 2SiO_{gas}$. In the lower levels, where the temp. is highest, mainly gaseous Si and SiO, and to a smaller extent gaseous SiO_2, are generated. The main function of C is the reduction of SiO. M. Hosch

GELD, P. V.

USSR/Galvanometers
Photoelectric effect

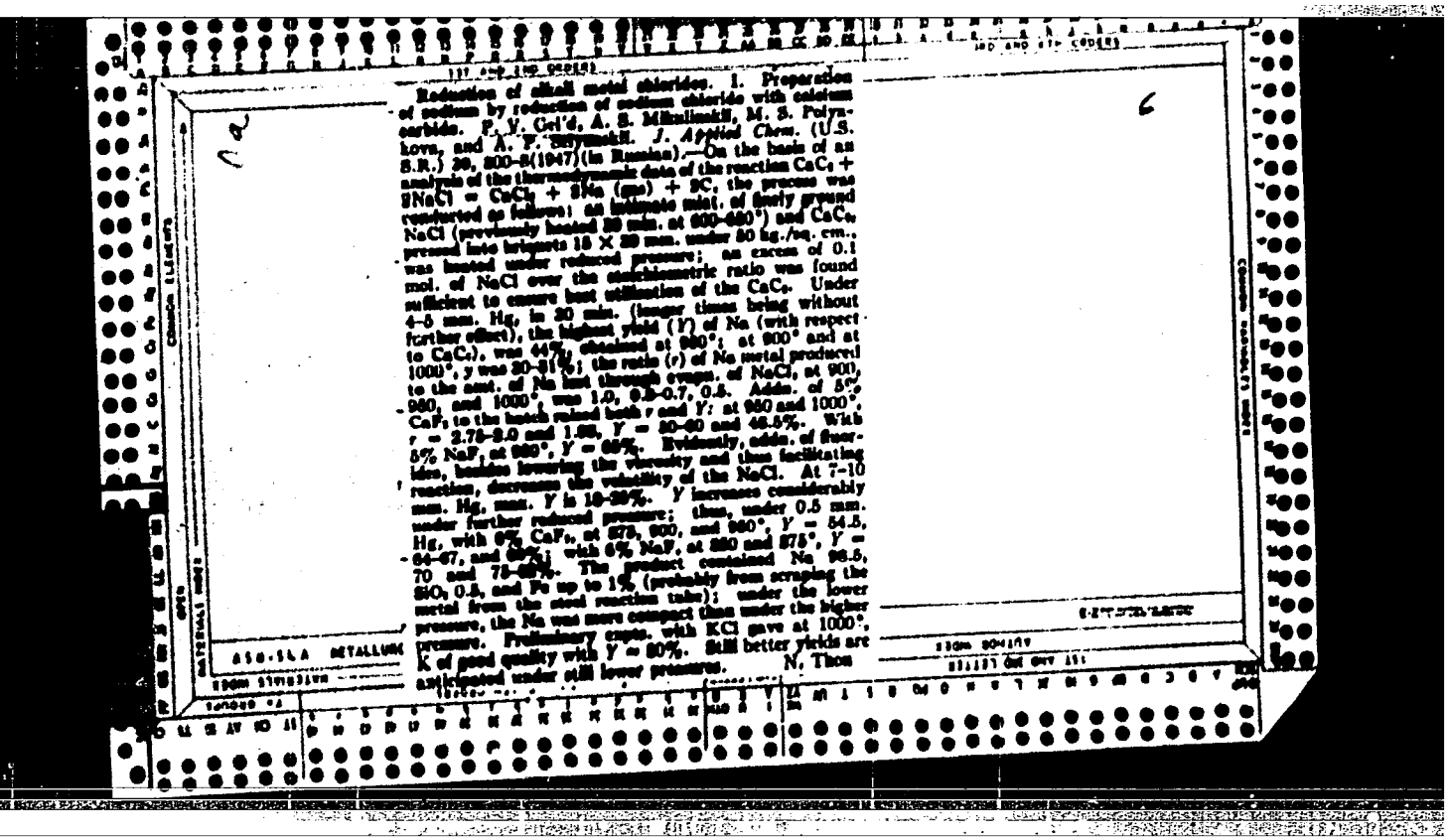
May 47

"The Photocontact Galanometer," P. V. Geld, A. S. Mikulinskiy, Yu. G. Koltypin, 1 p

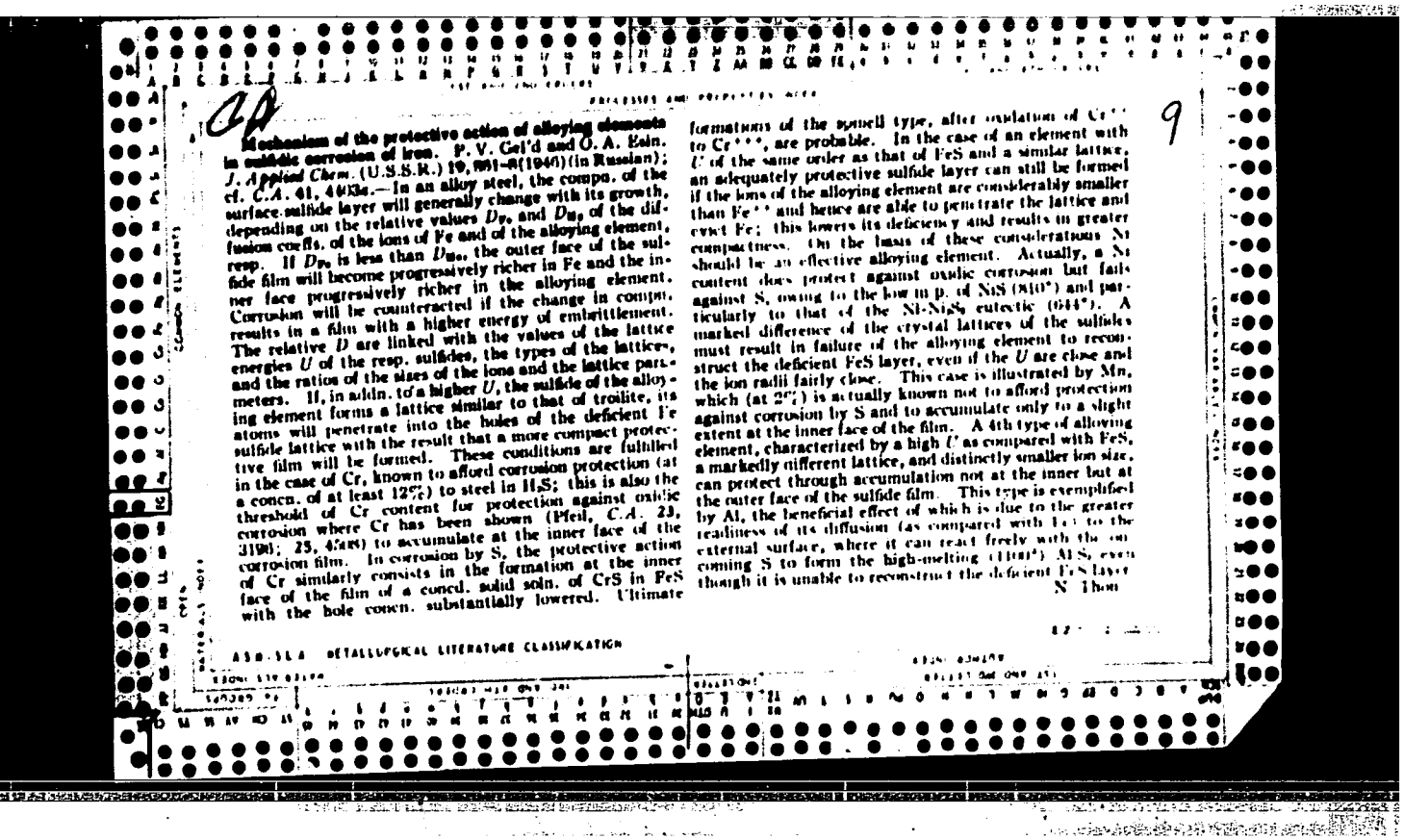
"Zavod Lab" Vol XIII, No 5

Three schematic diagrams, with very brief description.

PA 11T42



Reduction of alkali metal chlorides. I. Preparation of sodium by reduction of sodium chloride with calcium carbide. P. Y. Gel'd, A. S. Mikulinskii, M. S. Polyakovskii, and A. F. Smyrnskii. *J. Applied Chem.* (U.S.S.R.) 20, 800–8(1947)(In Russian).—On the basis of an analysis of the thermodynamic data of the reaction $CaC_2 + 2NaCl = CaCl_2 + 2Na$ (gas) + 2C, the process was conducted as follows: an intimate mixt. of finely ground NaCl (previously heated 30 min. at 600–650°) and CaC_2 pressed into briquets 15 × 20 mm. under 50 kg./sq. cm., was heated under reduced pressure; an excess of 0.1 mol. of NaCl over the stoichiometric ratio was found sufficient to ensure best utilization of the CaC_2. Under 4–5 mm. Hg, in 20 min. (longer times being without further effect), the highest yield (*Y*) of Na (with respect to CaC_2), was 44%, obtained at 950°; at 900° and at 1000°, *y* was 20–31%; the ratio (*r*) of Na metal produced to the amt. of Na lost through evapn. of NaCl, at 900, 950, and 1000°, was 1.0, 0.8–0.7, 0.5. Addn. of 5% CaF_2 to the batch raised both *r* and *Y*: at 950 and 1000°, *r* = 2.75–3.0 and 1.8%, *Y* = 50–60 and 46.5%. With 5% NaF, at 950°, *Y* = 60%. Evidently, addns. of fluorides, besides lowering the viscosity and thus facilitating reaction, decrease the volatility of the NaCl. At 7–10 mm. Hg, max. *Y* is 10–20%. *Y* increases considerably under further reduced pressure; thus, under 0.5 mm. Hg, with 6% CaF_2, at 875, 900, and 950°, *Y* = 54.5, 64–67, and 60%; with 6% NaF, at 850 and 875°, *Y* = 70 and 75–80%. The product contained Na 98.5, SiO_2 0.5, and Fe up to 1% (probably from scraping the metal from the steel reaction tube); under the lower pressure, the Na was more compact than under the higher pressure. Preliminary expts. with KCl gave at 1000°, K of good quality with *Y* = 30%. Still better yields are anticipated under still lower pressures. N. Thon



Mechanism of the protective action of alloying elements in sulfidic corrosion of iron. P. V. Gel'd and O. A. Esin. *J. Applied Chem.* (U.S.S.R.) 19, 881–8(1946)(in Russian); cf. *C.A.* 41, 4033a.—In an alloy steel, the compn. of the surface-sulfide layer will generally change with its growth, depending on the relative values D_{Fe} and D_{Me} of the diffusion coeffs. of the ions of Fe and of the alloying element, resp. If D_{Fe} is less than D_{Me}, the outer face of the sulfide film will become progressively richer in Fe and the inner face progressively richer in the alloying element. Corrosion will be counteracted if the change in compn. results in a film with a higher energy of embrittlement. The relative D are linked with the values of the lattice energies U of the resp. sulfides, the types of the lattices, and the ratios of the sizes of the ions and the lattice parameters. If, in addn. to a higher U, the sulfide of the alloying element forms a lattice similar to that of troilite, its atoms will penetrate into the holes of the deficient Fe sulfide lattice with the result that a more compact protective film will be formed. These conditions are fulfilled in the case of Cr, known to afford corrosion protection (at a concn. of at least 12%) to steel in H_2S; this is also the threshold of Cr content for protection against oxidic corrosion where Cr has been shown (Pfeil, *C.A.* 23, 3198; 25, 4588) to accumulate at the inner face of the corrosion film. In corrosion by S, the protective action of Cr similarly consists in the formation at the inner face of the film of a concd. solid soln. of CrS in FeS with the hole concn. substantially lowered. Ultimate formations of the spinel type, after oxidation of Cr^{++} to Cr^{+++}, are probable. In the case of an element with U of the same order as that of FeS and a similar lattice, an adequately protective sulfide layer can still be formed if the ions of the alloying element are considerably smaller than Fe^{++} and hence are able to penetrate the lattice and expel Fe; this lowers its deficiency and results in greater compactness. On the basis of these considerations Ni should be an effective alloying element. Actually, a Ni content does protect against oxidic corrosion but fails against S, owing to the low m. p. of NiS (810°) and particularly to that of the Ni-Ni_3S_2 eutectic (644°). A marked difference of the crystal lattices of the sulfides must result in failure of the alloying element to reconstruct the deficient FeS layer, even if the U are close and the ion radii fairly close. This case is illustrated by Mn, which (at 2%) is actually known not to afford protection against corrosion by S and to accumulate only to a slight extent at the inner face of the film. A 4th type of alloying element, characterized by a high U as compared with FeS, a markedly different lattice, and distinctly smaller ion size, can protect through accumulation not at the inner but at the outer face of the sulfide film. This type is exemplified by Al, the beneficial effect of which is due to the greater readiness of its diffusion (as compared with Fe) to the external surface, where it can react freely with the oncoming S to form the high-melting (1100°) Al_2S_3 even though it is unable to reconstruct the deficient FeS layer.

N. Thon

GEL'D, P. V.

GEL'D, P. V., MIKULINSKIY, A. S. I KOLTYPIN, YU. G.
36083 FotoKontaKtnyy gal'vanometr. V sb: Teoriya i praKtika rudnoy eleKtrotermii. Sverdlovsk-Moskva, 1948, S. 25-26.

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

GEL'D P. V.

GEL'D, P. V. I MIKULINSKIII, A. S.
36068 Germetichnyy shidKostnyy reostat. V sb: Teorizy i praKtika rudnoy elekTrotermii. Sverdlovsk-Moskva, 1948, S. 27-28.

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

GEL'D, P. V.

36183 GEL'D, P. V. I MIKULINSKIY, A. S.
Povedeniye ogneuporrnykh izdeliy pri vysokikh temperaturaKh V sb: Teoriya i praktika rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 29-32.

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

GEL'D, P. V.

GEL'D, P. V., IVANOV, V. K. I MIKULINSKIH, A. S.
36129 O raschetaKh elektricheskiKh i teplovyKh poley v eleKTrorudnotermicheskiKh pechaKh. V. sb: Teroiya i praKtiKa rudnoy eleKtrotermii. Sverdlovsk-MosKva, 1948, S. 64-71.

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

GEL'D, P. V.

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

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

GEL'D P. V.

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

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

GEL'D P. V.

GEL'D, P. V., MIKULINSKIY, A. S., I IVANOV, V. K.

36090 Temperaturnoye pole kerna grafitirovochnoy pechi. V sb: Teoriya i praktika rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 83-90.-Bibliogr: 8 nasv.

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

GEL'D, P. V.

GEL'D, P. V. MIKULINSKIY, A. S., YUMANOVA, L. V.

36181 O temperature shikhty i davlenii gazov v karbidnoy pechi. V sb: Teoriya i praktika rudnoy elektrotermii. Sverdlovsk-Moskva, 1948, S. 91-94.

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

GEL'D, P. V.

P. V. Gel'd and M. I. Kochnev, The equilibrium of systems containing silicon oxide. P. 1249

It is shown that the vapor pressure of SiO is independent of the amount of sublimed compounds as shown by measuring the vapor pressure of silicon oxide in a temperature interval 900-1150°C. From this can be concluded that solid silicon oxide is an individual substance. There is given an approximated dependence of the equilibrium constants of the reduction reactions of SiO_2 by silicon, carbon, carborundum and also SiO with the latter two on temperature. It is shown that the best effect in both cases is achieved by using carbon, the least - at SiC.

Chair of the Theory of Metallurgical Processes of the Ural Polytechnical Inst., April 14, 1948

SO: Journal of Applied Chemistry (USSR) 21, No. 12 (1948)

GEL'D, P. V. PA 70T20

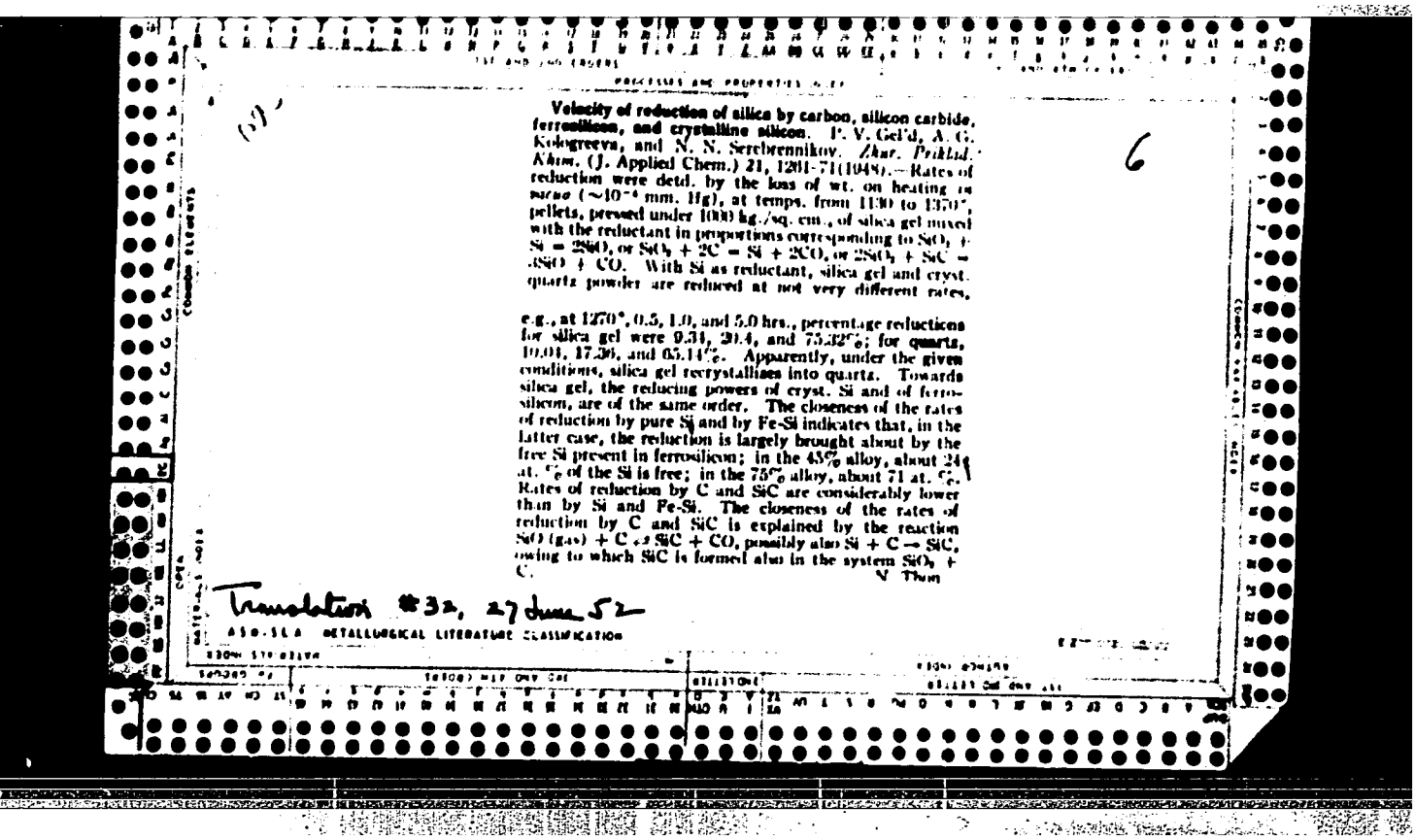
USSR/Chemistry - Calcium Carbonate Mar 1948
Chemistry - Electrolytes

"Electrolytic Nature of Liquid Commercial Calcium Carbide," P. V. Gel'd, O. A. Yesin, F. C. Maron, Ural Industrial Inst imeni S. M. Kirov; Ural Sci Res Chem Inst, 9 pp

"Zhur Prik Khim" Vol XXI, No 3

Discuss the structure of commercial calcium carbide in both solid and liquid states; in the latter state it is a strong electrolyte. Like molten silicates, its conductivity is mainly dependent on ions of small magnitude. Submitted 30 Jun 1947.

70T20

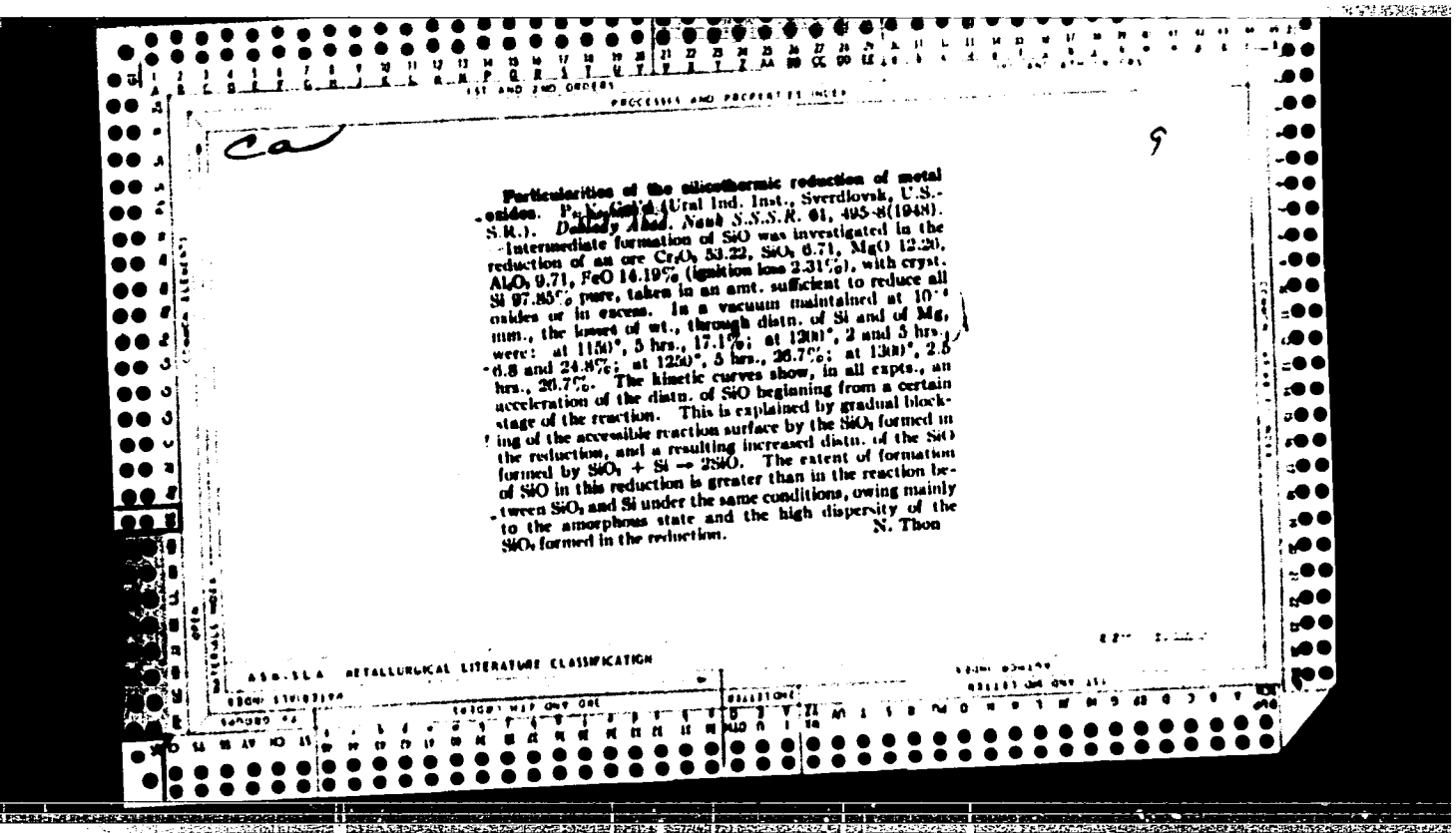


Velocity of reduction of silica by carbon, silicon carbide, ferrosilicon, and crystalline silicon. P. V. Gel'd, A. G. Kologreeva, and N. N. Serebrennikov. *Zhur. Prikhl. Khim.* (J. Applied Chem.) 21, 1201-71(1948).—Rates of reduction were detd. by the loss of wt. on heating in vacuo (~10^{-4} mm. Hg), at temps. from 1130 to 1370°, pellets, pressed under 1000 kg./sq. cm., of silica gel mixed with the reductant in proportions corresponding to $SiO_2 + Si = 2SiO$, or $SiO_2 + 2C = Si + 2CO$, or $2SiO_2 + SiC = 3SiO + CO$. With Si as reductant, silica gel and cryst. quartz powder are reduced at not very different rates, e.g., at 1270°, 0.5, 1.0, and 5.0 hrs., percentage reductions for silica gel were 9.34, 20.4, and 75.32%; for quartz, 10.01, 17.36, and 65.14%. Apparently, under the given conditions, silica gel recrystallizes into quartz. Towards silica gel, the reducing powers of cryst. Si and of ferrosilicon, are of the same order. The closeness of the rates of reduction by pure Si and by Fe-Si indicates that, in the latter case, the reduction is largely brought about by the free Si present in ferrosilicon; in the 45% alloy, about 24 at. % of the Si is free; in the 75% alloy, about 71 at. %. Rates of reduction by C and SiC are considerably lower than by Si and Fe-Si. The closeness of the rates of reduction by C and SiC is explained by the reaction $SiO\,(gas) + C \rightarrow SiC + CO$, possibly also $Si + C \rightarrow SiC$, owing to which SiC is formed also in the system $SiO_2 + C$.

N. Thon

Translation #32, 27 June 52

A50-51A METALLURGICAL LITERATURE CLASSIFICATION



Particularities of the silicothermic reduction of metal oxides. P. K. Gel'd (Ural Ind. Inst., Sverdlovsk, U.S.S.R.). *Doklady Akad. Nauk S.S.S.R.* 61, 495-8(1948). Intermediate formation of SiO was investigated in the reduction of an ore Cr_2O_3 53.22, SiO_2 6.71, MgO 12.20, Al_2O_3 9.71, FeO 14.19% (ignition loss 2.31%), with cryst. Si 97.85% pure, taken in an amt. sufficient to reduce all oxides or in excess. In a vacuum maintained at 10^{-4} mm., the lowest of wt., through distn. of Si and of Mg, were: at 1150°, 5 hrs., 17.1%; at 1200°, 2 and 5 hrs., 6.8 and 24.8%; at 1250°, 5 hrs., 26.7%; at 1300°, 2.5 hrs., 26.7%. The kinetic curves show, in all expts., an acceleration of the distn. of SiO beginning from a certain stage of the reaction. This is explained by gradual blocking of the accessible reaction surface by the SiO_2 formed in the reduction, and a resulting increased distn. of the SiO formed by $SiO_2 + Si \rightarrow 2SiO$. The extent of formation of SiO in this reduction is greater than in the reaction between SiO_2 and Si under the same conditions, owing mainly to the amorphous state and the high dispersity of the SiO_2 formed in the reduction.

N. Thon

USSR/Chemistry - Calcium Carbide Jun 48
Chemistry - Conductivity, Electric

"Electroconductivity of Solid Commercial Calcium Carbide," P. V. Gel'd, A. G. Kologreyeva, Ural Ind Inst, 9 ½ pp

PA 10/49T26

"Zhur Priklad Khimii" Vol XXI, No 6

There is an irreversible, sharp drop in electrical resistance of solid commerical calcium carbide when it is heated to a temperature $\geqslant$ 500°C. Notes that, due to differences in cooling conditions of separate parts of industrial castings carbide has considerable anisotropic properties--surface has more electrical

[redacted] 10/49T26

USSR/Chemistry - Calcium Carbide (Contd) Jun 48

resistance than interior. Shows that heating produces modification transformations, as a result of which calcium carbide becomes a semiconductor. This explains discrepancies between conductivity figures obtained by various researchers. Submitted 16 Jun 47.

[redacted] 10/49T26

GEL'D, P. V.

USSR/Chemistry - Silicon Oxide
Chemistry - Vapor Pressure

Aug 48

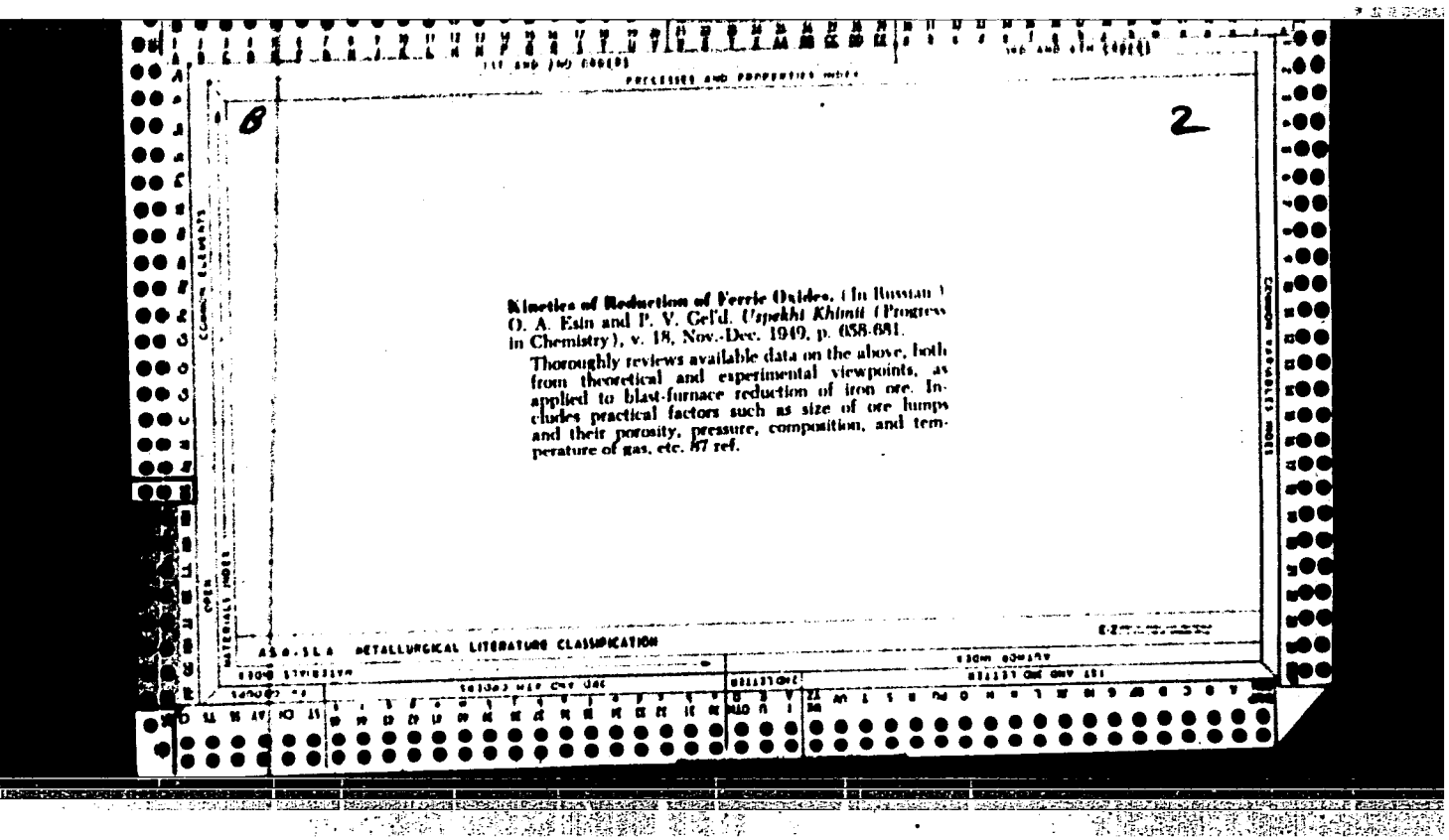
"Vapor Tension of Silicon Oxide," P. V. Gel'd, M. I. Kochnev, Ural Ind Inst imeni S. M. Kirov, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 4

Studies vapor pressure of silicon dioxide between 900° and 1100° C. Tabulates results. Independence of SiO vapor tension of its degree of volatilization shows that solid state is a separated phase, and not a solid solution. Submitted 15 May 48.

[redacted]

11/49T15



Kinetics of Reduction of Ferric Oxides. (In Russian.) O. A. Esin and P. V. Gel'd. *Uspekhi Khimii* (Progress in Chemistry), v. 18, Nov.-Dec. 1949, p. 658-681.

Thoroughly reviews available data on the above, both from theoretical and experimental viewpoints, as applied to blast-furnace reduction of iron ore. Includes practical factors such as size of ore lumps and their porosity, pressure, composition, and temperature of gas, etc. 87 ref.

GEL'D, P. V.

USSR/Chemistry - Dolomites, dissociation of
Chemistry - Carbonates mar 49

"Possibility of Preliminary Dissociation of Dolomites Into Their Component Carbonates," P. V. Gel'd, O. A. Yesin, Chair of Theory of Metallurgical Processes, Ural Ind Inst imeni S. M. Kirov, 5 pp

"Zhur Priklad Khim" Vol XXII, No 3

Thermographic and kinetic studies of dissociation of dolomites and magnesium under various temperature and pressure conditions showed: (1) first step of dissociation of dolomites occurs at stages lower than for magnesium, but (2) dissociation for both increases greatly at low pressures. Determined that there was no preliminary dissociation of dolomites in formation of their carbonates. Corrections of thermograms made it possible to determine stages at which various calcium carbonates were formed. Submitted 25 May 48.

PA 48/49T17

GEID, F. V.

USSR/Chemistry - Dolomites Apr 49
Chemistry - Dissociation

"Process of Redistribution of Ions During the Thermal Dissociation of Binary Salts," O. A. Yesin, F. V. Gel'd, S. I. Popel', Chair of Theory of Metallurgical Processes, Ural Ind Inst imeni S. M. Kirov, 6½ pp

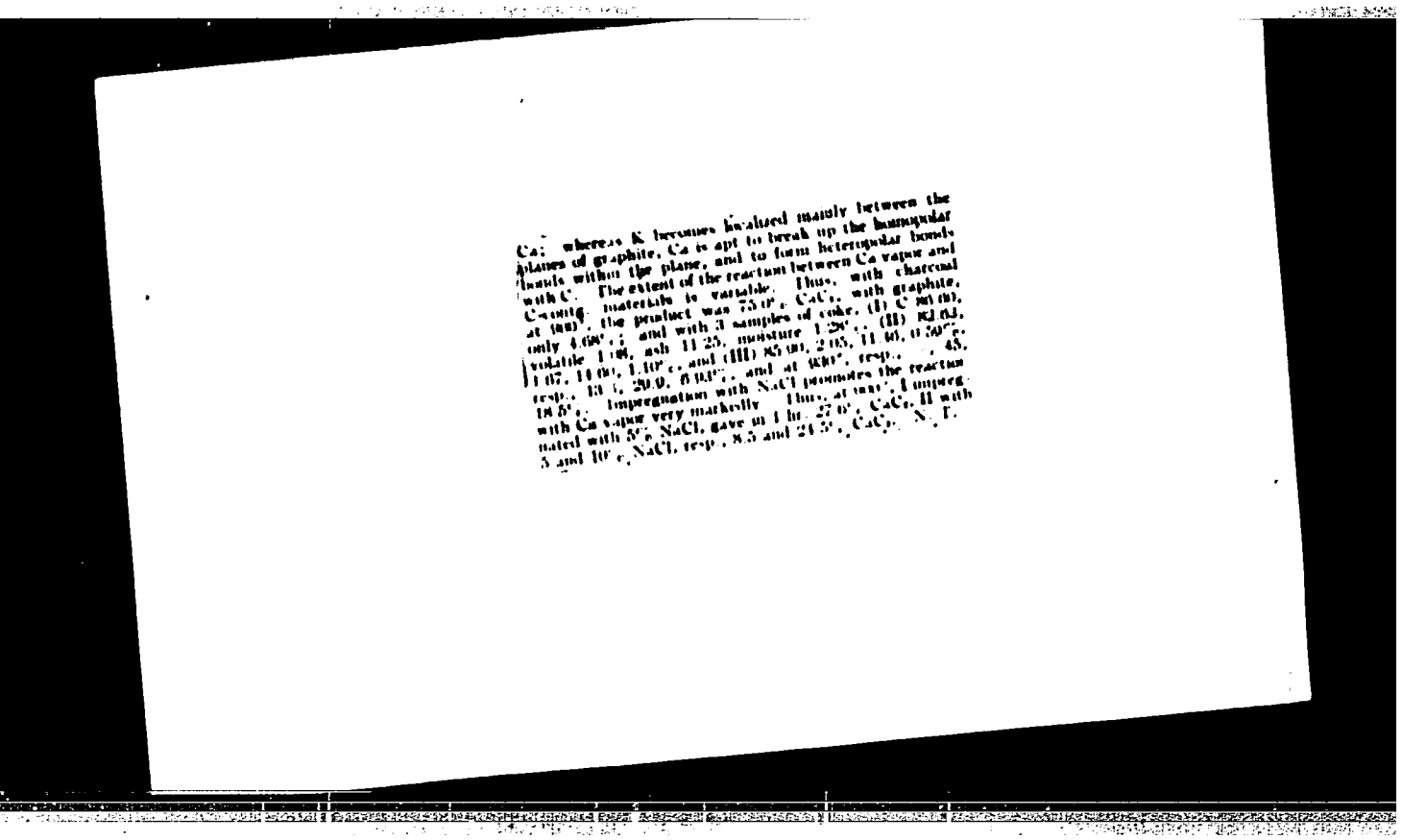
"Zhur Prik Khim" Vol XXII, No 4

Investigated thermal dissociation of dolomite $CaMg(Co_3)_2$ with formation of the solid phase $CaCO_3$ and MgO. Submitted 25 May 48.

60/49127

Mechanism of formation of technical calcium carbide P. V. Gel'd and I. S. Maron. *Zhur. Prikhal. Khim.* (J. Applied Chem.) 22, 1160-72(1949). cf. C.A. 44, 129g.—Arguments are presented in support of the assumption that Ca metal vapor, formed by way of $CaC_2 + 2CaO = 3Ca$ (gas) + 2CO, or $CaO + C = Ca$ (g.) + CO, plays an important role in the process. (1) Compressed pellets of CaO + C (graphite), heated 1 hr. under a reduced pressure of ~2 mm. Hg, showed a loss of CaO increasing with the temp., and attaining 400 mg. g. at 1040°; the condensate consisted of CaO and C, obviously reformed from Ca and CO in the cooler parts of the app. On heating a stoichiometric mixt. of CaO and C (graphite), topped by a layer of distinctly coarser graphite, the upper layer was found to contain CaO and CaC_2, the presence of which, because of the impossibility of an evapn. of CaO, can only be accounted for by an evapn. of Ca; the more so as, in the presence of added SiO_2 and Al_2O_3, significant to massive amts. of CaO and CaC_2 are found in the upper layer at temps. as low as 1400-1500°. Owing to the reaction $CaC_2 + 2CaO = 3Ca$ (gas) + 2CO, heating of tech. carbide results, through volatilization of Ca, in a marked enrichment of the residue in CaC_2; thus, in 1 hr. at 1760°, in A, the CaC_2 content rose from 57.8 to 81.5%, and at 1910°, in CO, from 52.3 to 61.7%.

The high dispersity of the carbide dust from the furnace also indicates its secondary formation from gaseous Ca and CO. The conclusion is that, along with the reaction between condensed phases, carbide is also largely formed through Ca (gas) + 2C = CaC_2. (2) For the reaction between solid CaO and the melt, consisting of cations Ca^{++} and anions O^{--} and $(Ca \cdots)_n$, the abnormally high sol. product of CaO in CaC_2, 0.88-0.94 at 2400°, as against 0.61-0.77 in other binary systems (with MgO, ZrO, BaO, CaF_2, Al_2O_3, SiO_2) + FeO) indicates the complex structure of the anions formed; the melt, around particles of solid CaO, becomes enriched in O ions. Conversely, reactions between the melt and solid C, consist mainly in a reaction with the O ions, resulting, at lower temps., merely in adsorption of O and its insertion between the graphite planes, but at higher temps. in deep oxidation of the graphite, along $C + (nO)^{--} = (C_n^{++})_n + 2n(CO)$. Within the melt, the reaction $(C_n)^{--} + mCa^{++} = mCa + 2C$ is much more probable than a similar reaction between Ca^{++} and O ions. (3) At the temp. of the carbide process, >1800°, Ca vapor and CO can coexist in equil. With graphite, Ca reacts in analogy with K, only more deeply, owing to the double charge of



Ca: whereas K becomes localized mainly between the planes of graphite, Ca is apt to break up the hexagonal bonds within the plane, and to form heteropolar bonds with C. The extent of the reaction between Ca vapor and C-containing materials is variable. Thus, with graphite, at 400°, the product was 75.0% CaC_2, with charcoal only 4.08%; and with 3 samples of coke, (I) C 80.03, volatile 1.04, ash 11.25, moisture 1.28%; (II) 82.03, 1.07, 10.01, 1.10%; and (III) 85.01, 2.05, 11.01, 0.30%, respectively. 13.6, 20.0, 6.01%; and at 480°, respectively, 45, 18.5%. Impregnation with NaCl promotes the reaction with Ca vapor very markedly. Thus, at 400°, 1 impregnated with 5% NaCl gave in 1 hr. 27.0% CaC_2, N. F. 5 and 10% NaCl, respectively, 8.5 and 24.5% CaC_2, N. F.

GEL'D, P. V.

chem 2
(2)

VAPOR PRESSURE OF SILICON MONOXIDE. P. V. Gel'd and M. I. Kochaev. Translated from Doklady Akad. Nauk S.S.S.R. 61, 649-52(1948). 6p. (UCRL-Trans-28)

The vapor pressure of synthetic SiO, obtained by the reaction $Si(s) + SiO_2(s) = 2SiO(g)$, was studied. Since SiO possesses a comparatively small vapor pressure, determinations were carried out by the molecular effluence method. Calculated results were checked against the vapor pressure measurement of KCl. Consideration is also given to the inclination of SiO toward reversed adsorption and the comparison of the experimentally determined heat of sublimation of the compound with known thermochemical figures. (J.A.G.)

Newsletter Lic. Abs.
V-8 Jan 15, 1954
Chemistry

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CA

Silicon losses on melting ferrosilicon P. V. Gel'd, O. A. Esin, N. N. Rulinov, and R. M. Larinman (Kirov Ural Polytech. Inst.). *Doklady Akad. Nauk S.S.S.R.* 67, 1073-6(1949); cf. C.A. 43, 4582h, 5987b. The nature of the phases involved in losses of Si on melting high-Si alloys was investigated. A solid phase that was almost SiO was collected from a melting furnace. The material richest in SiO was found at the charging level on the electrodes, etc., in the form of kidney-shaped sintered accretions with a glassy fracture; it appeared to have grown from the liquid state; it had a greasy green-yellow sheen, a hardness over 5; it was friable and had a fine grained fracture; its chem. analysis was SiO$_2$ (on the basis of SiO) 125-8%, Fe$_2$O$_3$ + Al$_2$O$_3$ 1.7 – 2.0%, CaO 0.3%, MgO 0.2%, and volatile matter 1.5%; calcn. gave 85% SiO and 10.5% SiO$_2$ in agreement with vapor pressure and optical-crystallographic data (n = 2.0). The gas phase first liquified and then formed the solid. Specimens of fume collected in 1-3 mm. on Ni gauze were examd. in a magnetic *electron microscope*. The spherical particles observed varied in size from 1 μ to 40 A. or less and were comparable to synthetic SiO particles. A. G. Guy

Inst. Phys. & Metals, Ural Affil.; AS