KHAZANOV, Ye.I.; SHUL'TS, B.V.

Kinetics and mechanism of the reduction of ilmenite and titanium-magnetite by carbon at sintering temperatures. Titan i ego splavy no.5:85-94 '61. (MIRA 15:2)
(Titanium ores)
(Ore dressing)

S/200/61/000/011/003/005
D202/D304

AUTHORS: Khazanov, Ye. I. and Shul'ts, B.V.

TITLE: Reduction of titanomagnetite by sintering with a solid reducing agent

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 11, 1961, 98-102

TEXT: In the present work the authors studied the reduction of synthetic titanomagnetite on samples obtained by the fusion of pure Fe_2O_3 and TiO_2 in an atmosphere of CO. They found that by sintering this mixture at 1200°, only ilmenite was formed. Fusion at 1500°C yielded a product consisting of two distinct phases: that of ilmenite and that of titanomagnetite. Only the last phase was magnetic and its chemical composition was as follows: (%): TiO_2 = 4.89, Fe_2O_3 = 63.44, FeO = 30.6, Fe = 0.22. X-ray crystallographic data showed it to be similar to those of the natural mineral. Its chemical analysis was performed by A.I. Kapustina,

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and its X-ray examination by S.A. Stakheyeva. This magnetic portion of the fusion product was used by the authors for their experiments by heating the product with pure charcoal in the temperature range 1000 - 1300°C. It was found that at lower temperatures, up to 1100°C, mostly iron oxides were reduced, the reduction of titanium oxide being very slight. With rising temperature the rate of iron oxide reduction was lowered owing to the formation of anosovite. It follows that for industrial purposes the reduction of ferrotitanic concentrates should be carried out at possibly low temperatures. The authors propose a following scheme for the reduction process: $(Fe_3O_4 \cdot FeO \cdot TiO_2; FeO \cdot TiO_2) + C = mFeO \cdot nTiO_2 \cdot p \cdot Ti_2O_3 + Fe + CO$, the ratios m : n : p depending on temperature. These conclusions were checked on natural ores. An addition of 20% soda facilitated the oxide reduction. There are 4 figures, 2 tables and 13 Soviet-bloc references.

ASSOCIATION: Vostochno-Sibirskkiy filial sibirskogo otdeleniya AN SSSR, Irkutsk (East Siberian Branch of the Siberian Department AS USSR, Irkutsk)

SUBMITTED: September 14, 1960

KHAZANOV, Ye.I.

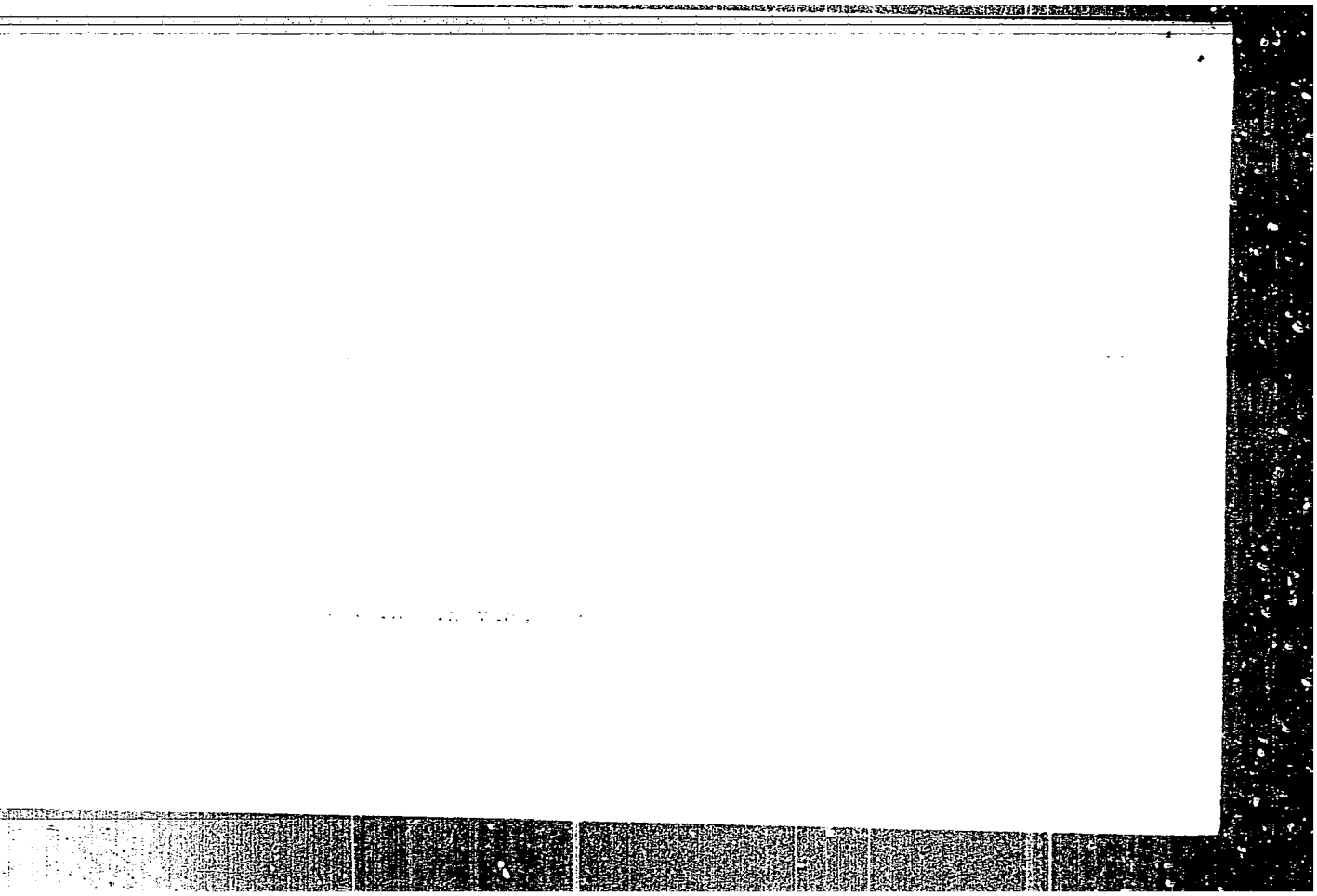
Processing alkaline aluminosilicate and other alumina-bearing rocks by sintering granulated mixtures. Izv.Sib.otd.AN SSSR no.12:53-63 '61. (MIRA 15:3)

1. Vostochno-Sibirskiy filial Sibirskogo otdeleniya AN SSSR, Irkutsk.
(Aluminum--Metallurgy)

[redacted], Ye.G.; [redacted], Ye.[redacted]

Material composition of filter residues from the production of aluminum-silicon alloys. Izv. Sib. otd. AN SSSR no.7 [illegible]-78 '62 (MIRA 17:9)

1. Institut neftekhimicheskogo sinteza Sibirskogo otdeleniya AN SSSR, Angarsk.



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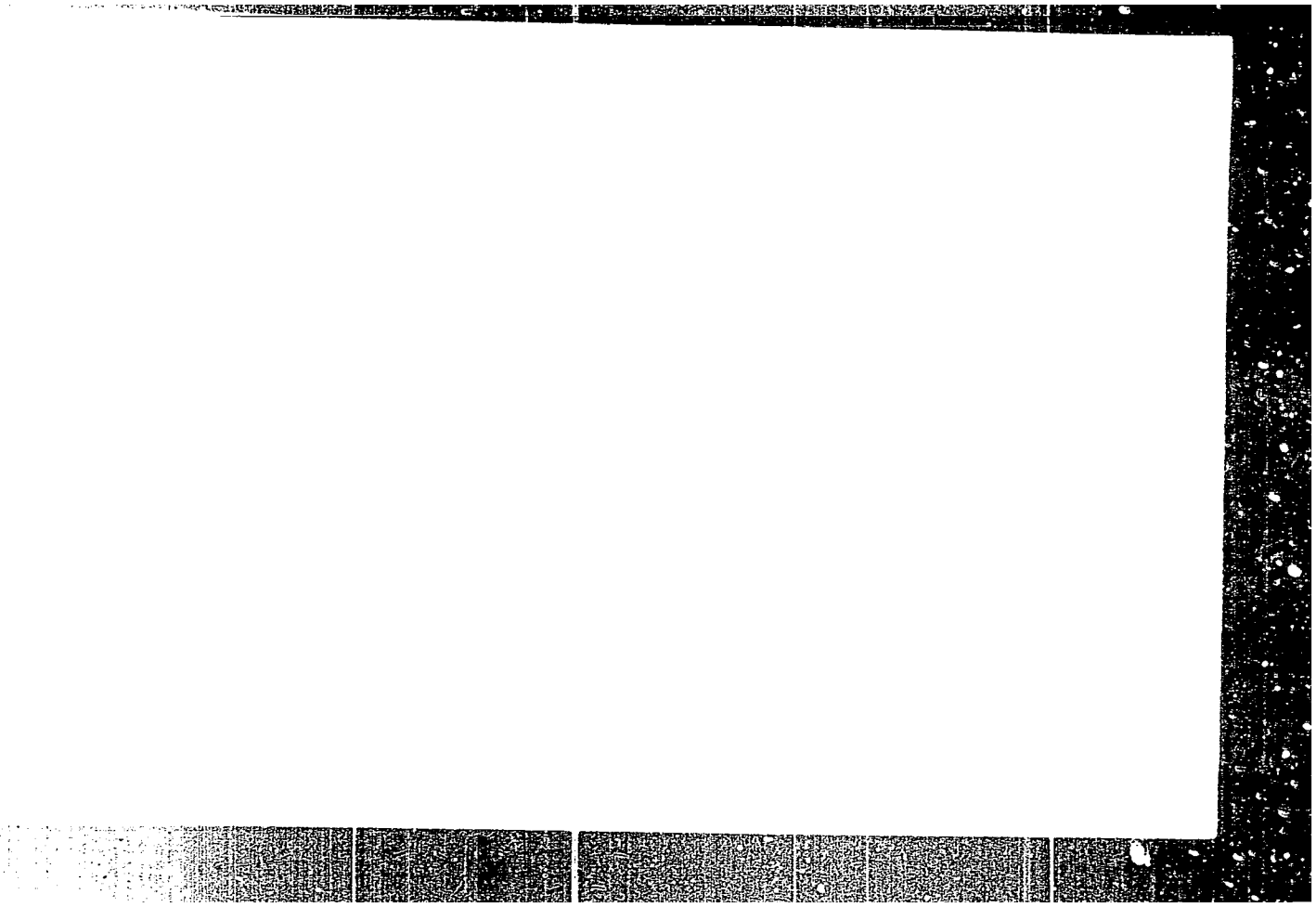


KHAZANOV, Ye.I.

Complex treatment of alkali alumosilicates and other alumina-bearing minerals. Trudy Vost.-Sib. fil. AN SSSR no.43:7-21 '62.
(MIRA 16:3)
(Aluminum oxide) (Alkali metal alumonisilicates)

KHAZANOV, Ye.I.; KHLYUPINA, A.F.

Temperature range for the sintering of alkali alumosilicate charge mixtures. Trudy Vost.-Sib. fil. AN SSSR no.43:22-35 '62. (MIRA 16:3)
(Alkali metal aluminosilicates) (Sintering)

KHAZANOV, Ye.I.; SHUSHLYANNIKOVA, E.M.; KHLYUPINA, A.F.; KUZ'MINA, G.V.

Industrial assaying of feldspar rocks as a raw material for the production of alumina. Trudy Vost.-Sib. fil. AN SSSR no.43:36-39 '62. (MIRA 16:3)

(Feldspar—Testing) (Aluminum oxide)

KHAZANOV, Ye.I.; OTTO, D.D.

Investigating the process of granulating alkali alumosilicate charge mixtures. Trudy Vost.-Sib. fil. AN SSSR no.43:40-54 '62. (MIRA 16:3)
(Alkali metal aluminosilicates) (Ore dressing)

KHAZANOV, Ye.I.; GALKOV, A.S.

Laboratory equipment for modeling the sintering process of alumina-bearing charge mixtures. Trudy Vost.-Sib. fil. AN SSSR no.43:55-58 '62. (MIRA 16:3)

(Sintering—Models) (Aluminum oxides)

GALKOV, A.S.; KHAZANOV, Ye.I.; SHISHLYANNIKOVA, E.M.

Distribution of water-soluble alkalies in sinter cakes of nepheline-sodium-calcium charge mixtures. Trudy Vost.-Sib. fil. AN SSSR no.43: 59-62 '62. (MIRA 16:3)
(Nephelite) (Sintering--Testing)

KUZ'MINA, G.V.; KHLYUPINA, A.P.; KHAZANOV, Ye.I.; SHISHLYANNIKOVA, E.M.; Prinimal uchastiye GALKOV, A.S.

Nepheline rocks of the Buryat A.S.S.R. are a possible raw material for the production of alumina. Trudy Vost.-Sib. fil. AN SSSR no.43:63-68 '62. (MIRA 16:3)

(Buryat-Mongolia—Nephelite) (Aluminum oxide)

KHAZANOV, Ye.I.; KUZ'MINA, G.V.; SHAKHEYEVA, S.A.; SHUL'TS, B.V.

Changes in the phase composition of clays during heating in a neutral atmosphere in the presence of a solid reducing agent. Trudy Vost.-Sib. fil. AN SSSR no.43:69-76 '62. (MIRA 16:3)
(Aluminum oxide) (Clay) (Phase rule and equilibrium)

KHAZANOV, Ye.I.; KUZ'MINA, G.V.; DOMTSOVA, S.G.

Changes in the phase composition of an alumina-kaolin charge mixture in the process of charge-resistance melting of fused silicon and aluminum. Trudy Vost.-Sib. fil. AN SSSR no.43:77-81 '62. (MIRA 16:3)
(Aluminum—Electrometallurgy) (Slag) (Phase rule and equilibrium)

KHAZANOV, Ye.I.

Physicochemical principles and new data on the experimental investigation of the carbothermic method of preparing magnesium in the vacuum. Trudy Vost.-Sib. fil. AN SSSR no.43:95-111 '62. (MIRA 16:3)
(Magnesium--Electrometallurgy) (Vacuum metallurgy)

KHAZANOV, Ye.I.; SAFONOVA, Ye.G.; STAKHEYEVA, S.A.; KUZ'MINA, G.V.

Interaction of aluminum carbide and magnesium oxide. Trudy Vost.-Sib. fil. AN SSSR no.43:112-128 '62. (MIRA 16:3)
(Aluminum carbide) (Magnesium oxide)

SAFONOVA, Ye.G.; KHAZANOV, Ye.I.

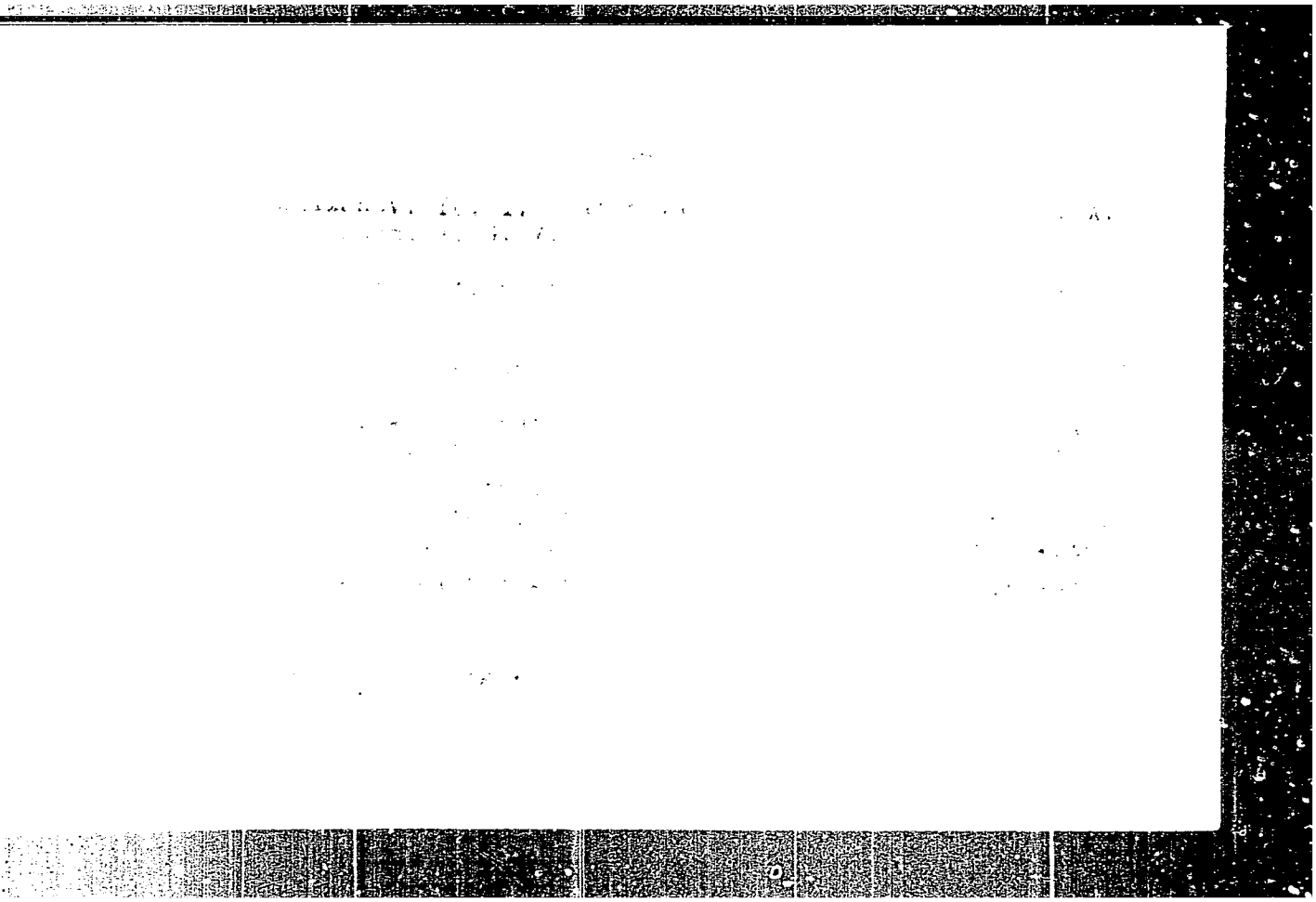
Composition of filtration residues. Trudy Vost.-Sib. fil. AN SSSR no.43:129-141 '62. (MIRA 16:3)
(Tailing (Metallurgy)—Analysis) (Electrometallurgy—By-products)

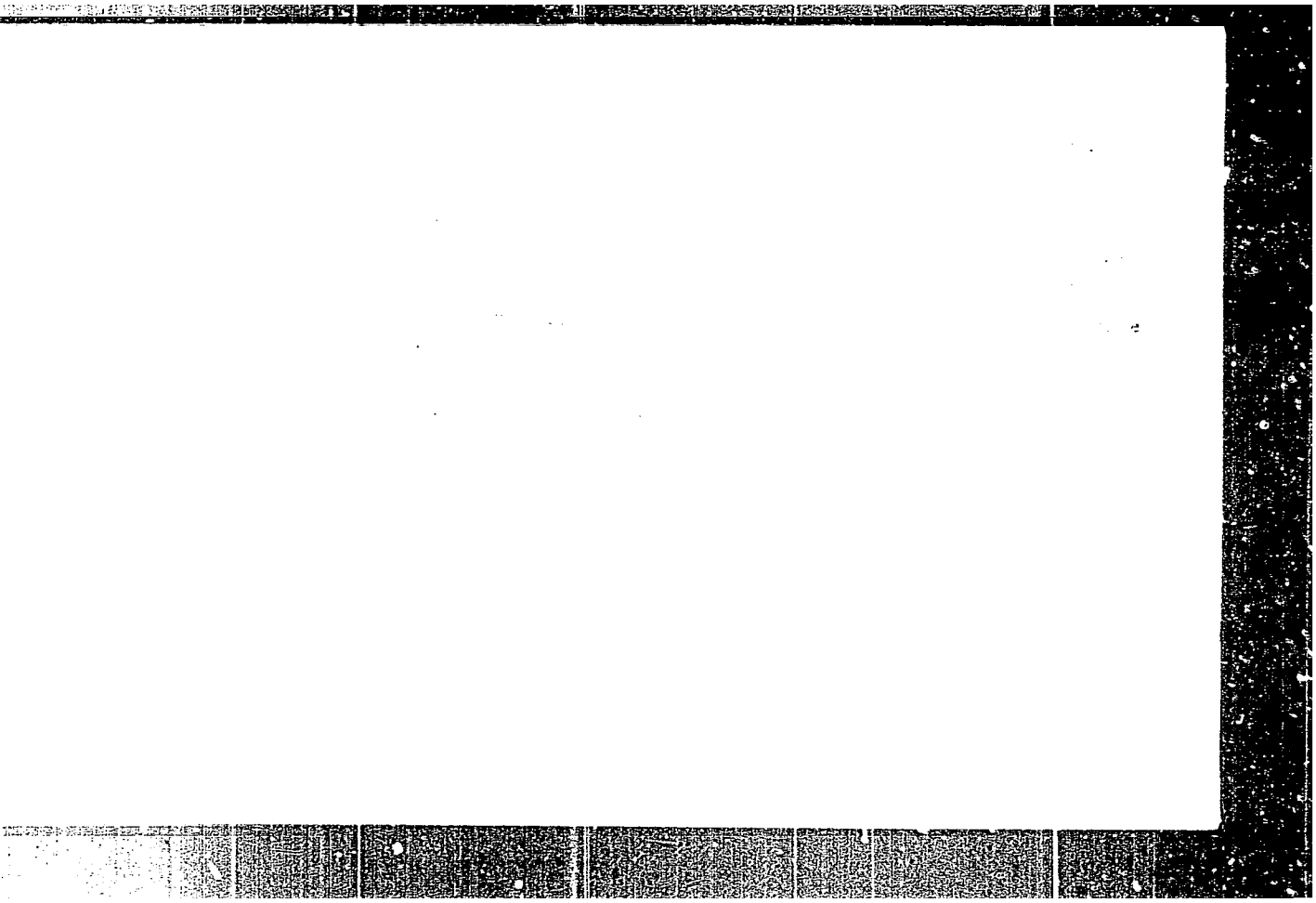
KHAZANOV, Ye.I.; SAFONOVA, Ye.G.; VRUBLEVSKAYA, I.A.

Composition and properties of dolomites from the Irkutsk Province.
Trudy Vost.-Sib. fil. AN SSSR no.43:142-153 '62. (MIRA 16:3)
(Irkutsk Province—Dolomites—Analysis)

KHAZANOV, Ye.I.; SAFONOVA, Ye.G.

Industrial testing of dolomites form deposits in the Irkutsk Province. Trudy Vost.-Sib. fil. AN SSSR no.43:154-157 '62. (MIRA 16:3)
(Irkutsk Province—Dolomites—Testing)





DROBOT, N.M.; KHAZANOV, Ye.I.

Method of measuring electric conductivity for the study of sintering processes in alumina-containing mixtures. Izv. SO AN SSSR no.7 Ser.khim.nauk no.2:54-61 '63. (MIRA 16:10)

1. Institut nefte- i uglekhimicheskogo sinteza Sibirskogo otdeleniya AN SSSR, Irkutsk.

KHAZANOV, Ye.I.; STAKHEYEVA, S.A.; KUZ'MINA, G.V.

Interaction between sodium aluminate and dicalcium silicate.
Zhur.prikl.khim. 38 no.6:1381-1383 Je '65.
(MIRA 18:10)

KHAZANOV, Ye.I.; SHISHLYANNIKOVA, E.M.; RESHCHENKO, Z.I.

Simultaneous complex treatment of alumina-containing highly ferrous, alkali aluminosilicates. TSvet.met. 38 no.7:58-62 Jl '65. (MIRA 18:8)

OBVINTSEV, Val'demar Ivanovich; YAKIMUK, Vitaliy Zakharovich; KHAZANOV, Yevgeniy Kharitonovich; KRYZGALOVA, N., red.; VELICHKO, N., tekhn. red.

[Using large blocks in the installation of piping for industrial and sanitary systems] Montazh ukrupnennymi blokami truboprovodov sanitarno-tekhnicheskikh sistem. Kiev, Gosstroiizdat USSR, 1963. 55 p. (MIRA 17:1)

OBVINTSEV, Val'demar Ivanovich; KHAZANOV, Yevgeniy Kharitonovich; YAKIMUK, Vitaliy Zakharovich; KOMENDANT, K.P., red.; LEUSHCHENKO, N.L., tekhn. red.

[Production of half-finished pipe units for sanitary engineering systems of buildings]Proizvodstvo trubozagotovok sanitarno-tekhnicheskikh sistem zdanii. Kiev, Gosstroiizdat, USSR, 1962. 45 p. (MIRA 15:8)
(Sanitary engineering) (Pipe)

KHAZANOV, Ye.N., inzh.; BOGOSLOVSKIY, S.G., inzh.

Efficient utilization of mustard seeds. Masl.-zhir. prom. 29 no.6:7-8 Je '63. (MIRA 16:7)

1. Gosudarstvennyy institut po proyektirovaniyu masloboynoy, zhirovoy, mylovarennoy, parfyumernoy i margarinovoy promyshlennosti.

(Mustard seed)

KHAZANOV, Yu., inzh-ekonomist

Traveling goods. Mest.prom.i khud.promys. 3 no.12:28 D '62. (MIRA 16:2)

(Siberia, Western--Industrial organization)

BYCHKOV, S.M.; KHAZANOVA, A.I.

Interaction of chondromucoprotein and chondroit..
insulfate A with polymyxin M. Vop.med.khim. 11 no.5:
11-17 S-O '65. (MIRA 19:1)

1. Laboratoriya Ministerstva zdravookhraneniya SSSR, Moskva.
Submitted April 9, 1964.

RYCHKOV, G.M.; AKHMANOVA, A.I.

Interaction of chondromucoprotein and chondroitinsulfate A with hexaminocobalt chloride. Biokhimiia 30 no.1:141-147 Ja-F '65. (MIRA 18:6)

1. Laboratoriya Ministerstva zdravookhraneniya SSSR, Moskva.

BYCHKOV, S.M.; ZBARSKIY, I.B.; KHAZANOVA, A.I.; FOMINA, V.A.

Mucopopysaccharides and mucoproteins metabolism in cell nuclei. Doklady Akad. nauk SSSR 78 no.1:99-101 1 May 1951. (CLML 20:9)

1. First Moscow Medical Institute. 2. Presented by Academician A.D. Speranskiy 23 January 1951.

BYCHKOV, S.M.; KHAZANOVA, A.I.

Interaction of streptomycin with chondroitin sulfate and chondromucoprotein. Vop. med. khim. 9 no.1:48-56 Ja-F '63. (MIRA 17:6)

1. Laboratoriya Ministerstva zdravookhraneniya SSSR, Moskva.

MOGILEVSKIY, Ye.M.; KHAZANOVA, A.S.; FINGER, G.G.

Formation of viscose silk by a continuous process at high speed. Khim.volok. no.5:43-46 '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.

(Rayon)

VASIL'YEV, Yu.S., dots., kand. tekhn. nauk; VEL'NER, Kh.A., dots., kand. tekhn. nauk; GINDUS, D.O., inzh.; GOLOVACHEVSKIY, N.I., dots., kand. tekhn. nauk; GROMOV, A.I., inzh.; DOMANSKIY, L.K., inzh.; ISAYEV, Yu.M., inzh.; KULESH, N.P., dots., kand. tekhn. nauk; MIKHALEV, B.N., dots., kand. tekhn. nauk; MOROZOV, A.A., prof., doktor tekhn. nauk [deceased]; NALIMOV, S.M., st. nauchn. sotr., kand. tekhn. nauk; REZNIKOVSKIY, A.Sh., kand. tekhn. nauk; SVANIDZE, G.G., doktor tekhn. nauk; TANANAYEV, A.V., dots., kand. tekhn. nauk; KHAZANOVA, A.Z., inzh.; CHERNYATIN, I.A., st. nauchn. sotr., kand. tekhn. nauk; SHCHAVELEV, D.S., prof., doktor tekhn. nauk; YAGODIN, N.N., st. nauchn. sotr., kand. tekhn. nauk; LEONOVA, B.I., red.

[Utilization of water power] Ispol'zovanie vodnoi energii. Moskva, Energiia, 1965. 563 p. (MIRA 19:1)

KLINGERT, Nikolay Vasil'yevich; KHOKHARIN, Anatoliy Kharitonovich; KHAZANOVA, A.Z., inzh., retsenzent

[Steel pipelines and equalizing reservoirs of hydroelectric power stations] Stal'nye truboprovody i uravnitel'nye rezervuary gidroelektricheskikh stantsii. Moskva, Energiia, 1965. 207 p. (MIRA 18:3)

1. Leningradskaya proyektno-konstruktorskaya kontora "Gidrostal'proyekt"

KHAZANOVA, D., insh.

For the increase in the coefficient of power. Prom.koop. 14 no.2:12-13 F '60. (MIRA 13:5)

1. Proyektno-konstruktorskoye byuro Mosoblpromsoveta. (Electric capacitors)

ROZINS'KIY, L.B. [Rozyns'kyi, L.B.]; BICHKOVS'KIY, V.N. [Bychkovs'kyi,V.N.] KHAZANOVA, D. Yu.

Intestinal pneumatosis in children. Ped., akush. i gin. 25 no.1:23-25 '63. (MIRA 16:5)

1. Kafedra dityachikh infektsiynikh khvorob (zav.-dotsent S.M. Gavalov (S.M.Havalov]), Krims'kogo medichnogo institutu (rektor dotsent S.I.Georgiyevs'kiy [S.I.Heorhiievs'kyi]) ta patalogo-anatomichne viddilennya 4-i mis'koi likarni (golovniy likar Ya.I.Vidershayn).

(INTESTINES—DISEASES) (CHILDREN—DISEASES)

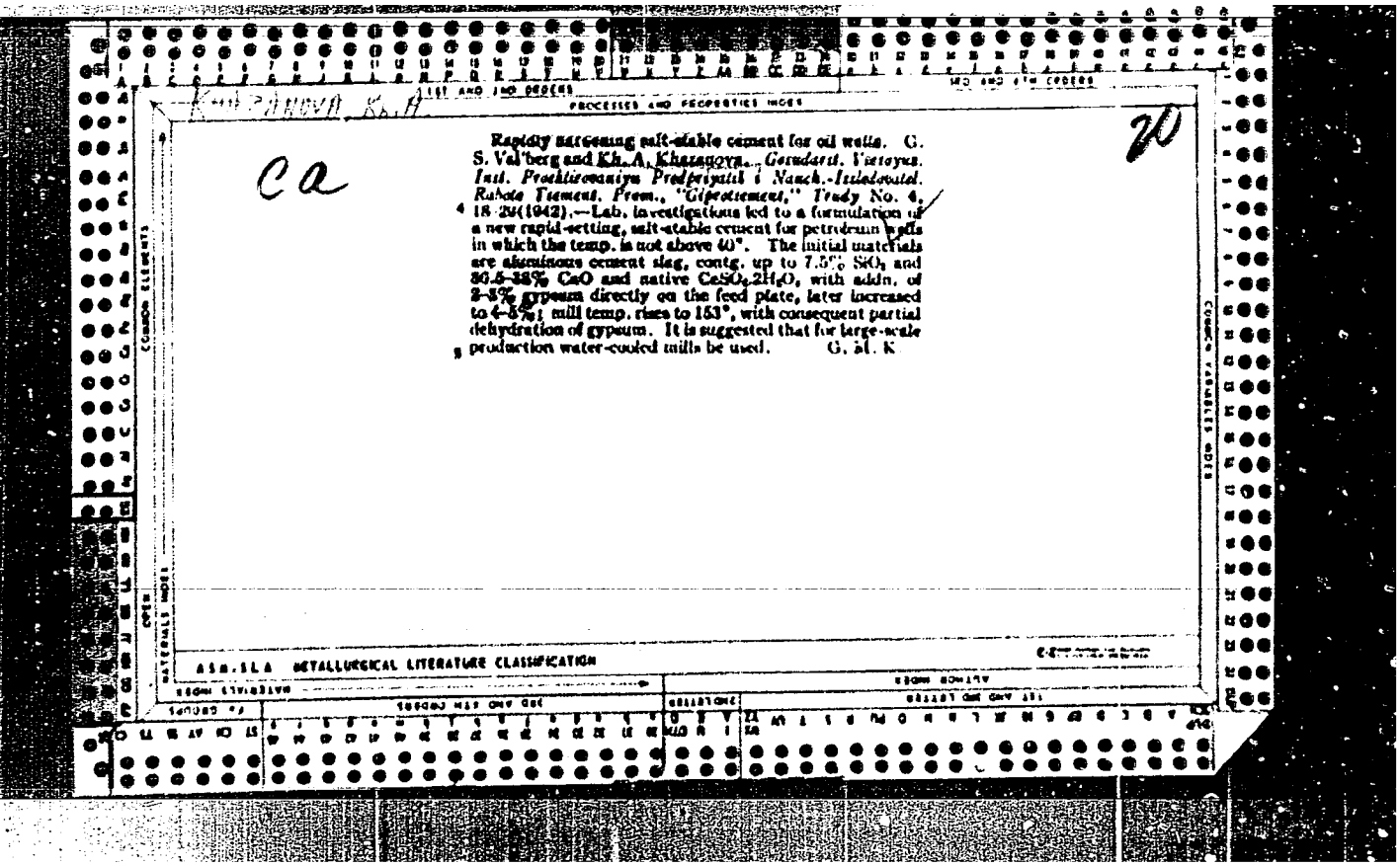
KHAZANOVA, G.(Chelyabinskaya oblast'); PLATONOVA, N. (Chelyabinskaya oblast')

Improve the procedure for registering the staff. Fin.SSSR 19 no.8:76 Ag '58. (MIRA 11:9)

1. Zaveduyushchiy Kopeyskim gorfinotdelom (for Khazanova); 2. Starshiy inspektor po shtatam Kopeyskogo gorfinotdela (for Platonova).
(Wages--Accounting)

ZHEVNOVATYY, A.I.; Prinimali uchastiye: KHAZANOVA, I.V.; KUZNECHENKOV, I.G.; CHUKHONTSEV, V.P.; SHENBERG, G.F.

Agitation flowsheet in the leaching of alumina-bearing calcine with the use of hydrocyclones as main apparatuses for separating the pulp. TSvet. met. 36 no.1:50-53 Ja '63. (MIRA 16:5)
(Leaching) (Alumina)



Ca

W

Rapidly hardening salt-stable cement for oil wells. G. S. Vel'berg and Kh. A. Khazanova. *Gorudarst. Vsesoyuz. Inst. Prokhirovaniya Predpriyatii i Nauch.-Issledovatel. Rabote Tsement. Prom., "Giprotsement," Trudy* No. 4, 18–34(1942).—Lab. investigations led to a formulation of a new rapid-setting, salt-stable cement for petroleum wells in which the temp. is not above 40°. The initial materials are aluminous cement slag, contg. up to 7.5% SiO_2 and 30.5–38% CaO and native $CaSO_4.2H_2O$, with addn. of 2–5% gypsum directly on the feed plate, later increased to 4–5%; mill temp. rises to 153°, with consequent partial dehydration of gypsum. It is suggested that for large-scale production water-cooled mills be used. G. M. K.

15 (6)

SOV/101-59-5-4/11

AUTHORS: Il'ina, N. V., Vlasov, I. I., Khazanova, Kh. A., and Shadrina, M. N.

TITLE: On the Use of Light-Weight Refractories for Lining Rotary Kilns

PERIODICAL: Tsement, 1959, Nr 5, pp 9 - 13 (USSR)

ABSTRACT: The authors state that in the early days of the cement industry the lining of kilns was considered exclusively as a protection of the kiln body against the effect of high temperatures. Consequently any fire resistant material was acceptable. The increase in the productivity of kilns has led to more requirements on the qualities of the lining. The physico-chemical process varies in depending upon the thermal conditions in the burning zones of the kiln. To reduce thermal losses, or to save as much as possible of the heat for the burning process, a suitable lining material must be used for insulation purposes. For years this matter has been raised by various authors. High-porous fire-resistant chamotte refractory insulation bricks were used for lining kilns in

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the U. S., England, Puerto Rico. Compared with the light-weight refractory material produced at the Borovichskiy kombinat "Krasnyy keramik" ("Krasnyy Keramik" Borovichi Combine), it shows better thermo-insulation properties, a smaller volumetric weight, with a mechanical strength of 30 kg/sq cm. On the other hand the Borovichi light-weight refractory material has better mechanical resistance, which is for compressive strength 45 to 80 kg/sq cm for class A material, and 30 to 45 kg/sq cm for class B material. Due to the lower content of alumina, the fire resistance of the foreign material is 1690° against 1750° of the Borovichi light-weight refractories. Table 1 shows comparative data on the materials originated from the General Refractories Company and the "Krasnyy Keramik" Borovichi Combine, classes A and B. The Borovichi light-weight refractory bricks were first tried in the lining of a rotary kiln at the Pikalevskiy tsementnyy zavod (Pikalevo Cement Plant). The bricks used belonged to class B (GOST 5040 - 58). Their compressive strength was within the limits of 35 - 42 kg/sq cm (average 38 kg/sq cm), porosity 52% and volumetric weight 1.26 g/cu cm.

During a thermal stability test, the material resisted more than 25 heat variations within the 850°C heat limit and intermediate water cooling. The fluxing action between clinker and lining bricks was also tried at a maximum termperature of 1250° for light-weight refractory lining, followed by a severe trial at a temperature of 1500°. A photograph (Figure 1) shows bricks prior to and after the trial. No erosion was found in the lining after the first of the above trials. In a second test, after one hour of exposure to the effects of a heat of 1,500°C, the lining bricks were affected by the raw mixture to a depth ranging between 1 and 5 mm. Examination of the junction between two zonal linings made of Ts-1 and Ts-2 chamotte bricks, and light-weight lining adjacent to the latter without temperature compensations seams, revealed deterioration in the light-weight refractory bricks. At the junction borders the bricks became friable, and a 2 mm wide gap appeared at the junction. Cracks were visible 70 to 80 cm inward from the junction. Photograph 2 shows junctions at the cold side (left) and at the hot side of the kiln (right).

On the Use of Light-Weight Refractories for Lining Rotary Kilns

After 6 months of successful operation of a kiln lined with light-weight refractories, the temperatures of the kiln body were measured. In the tested zone, the temperature was 180 - 195° and in the zones lined with usual chamotte refractory bricks, the temperature was 235° at the hot side of junction and 220° at the cold side. Heat losses for 1 sq m of the tested surface was 2430 kcal/sq m per hour, or 69% of the heat losses of the sections lined with chamotte refractories was found to be 3540 kcal/sq m per hour. Consequently, use of the light-weight chamotte with a volumetric weight of 1.9 g/ccm for lining will result in a 30% reduction of heat losses due to conduction through the lining. The author concludes that the first experience in lining the burning zone in the rotary kiln at the Pikalevo Cement Plant has shown that the qualities of the domestic fire-resistant material are not inferior to material of foreign origin, in relation to fire resistance, strength, thermal resistance and the flux between the clinker and bricks. The author recommends that in another test the trial zone be lined with class A light-weight refractory bricks over a length

of 20 m. The bricks should be laid on a chamotte-clay mixture. Precautions must be taken to exclude the possibility of a longitudinal displacement of the lining.
There are 2 sets of photographs, 1 table and 5 references 3 of which are English, 1 German and 1 Soviet

IL'INA, N.V.; KHAZANOVA, Kh.A.

Wear of aluminum silicate refractories in the lining of a rotary cement-roasting kiln. Trudy Giprotsement no.24:92-102 '62. (MIRA 16:4)

(Aluminum silicates) (Kilns, Rotary)

KHAZANOVA, L.Ye.

Relation of acquired resistance to antibiotics and bacteriophage to variability of properties of pathogenic staphylococci. Zhur. mikrobiol.epid. i immun. 28 no.12:61-65 D '57. (MIRA 11:4)

1. Iz Moskovskogo nauchno-issledovatel'skogo instituta vaktsin i syvorotok im. I.I. Mechnikova.
(MICROCOCCUS PYOGENES,
acquired resist. to antibiotics & bacteriophage, eff. on variability (Rus)
(ANTIBIOTICS, effects,
on Micrococcus pyogenesis, eff. of acquired resist. on variability (Rus)
(BACTERIOPHAGE,
Micrococcous pyogenes acquired resist., eff. on variability (Rus)

KHAZANOVA, L.Ye.

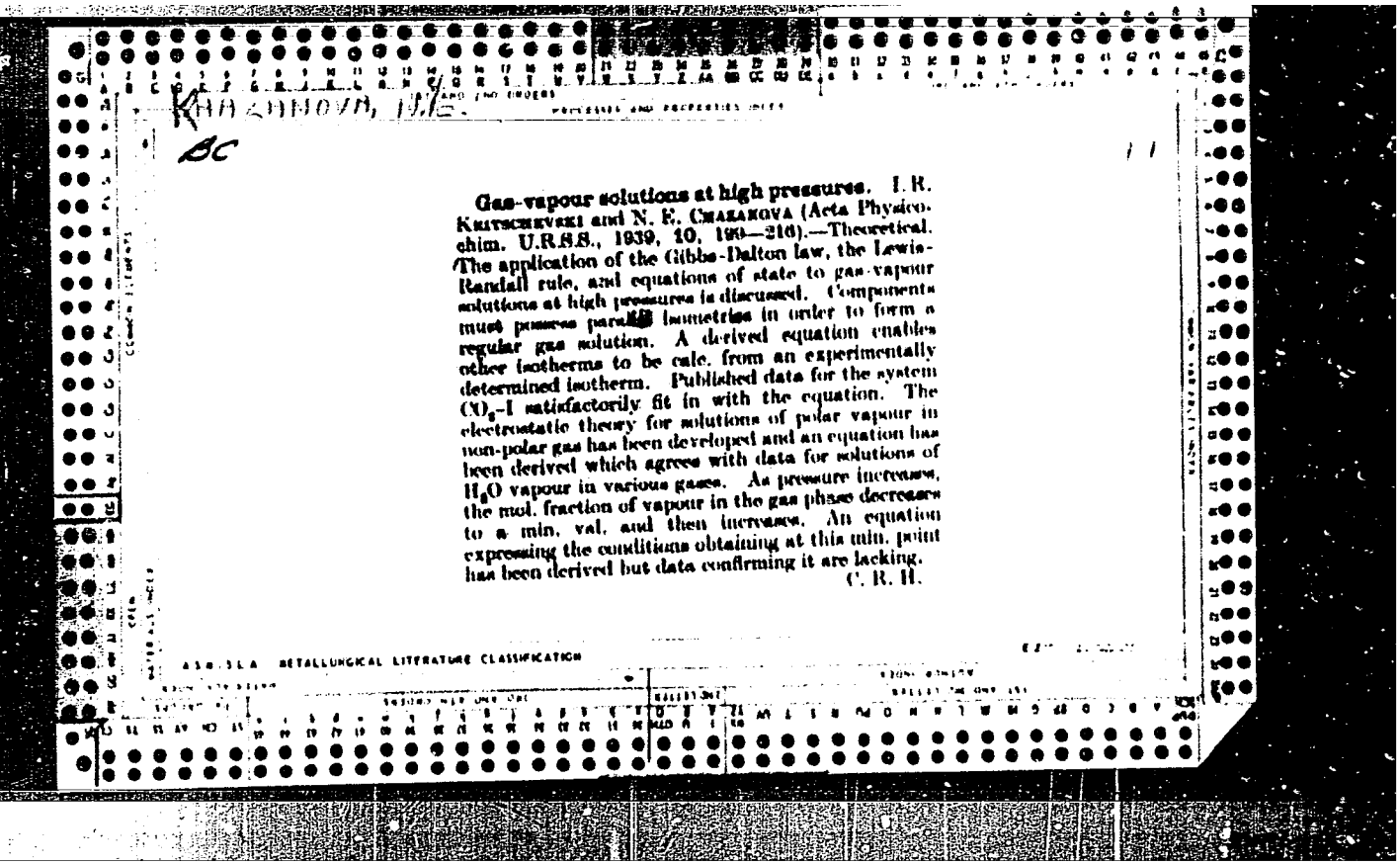
Bacteriological properties of blood sera in typhoid and paratyphoid fever. Zhur. mikrobiol., epid. i immun. 41 no.10:111-116 '64. (MIRA 18:5)

1. Moskovskiy institut vaktsin i syvorotok imeni Mechnikova.

KHAZANOVA, N. Ye.

"Gas-Vapor Solutions at High Pressures".
Zhur Fiz Khim., 12, No. 1, 1939. Nitrogen Institute, Moscow. Rcd. 3 June 1938

Report U-1613, 3 Jan. 1952



KRASNOVA, N.E.

BC

Gas-vapour solutions at high pressures. I. R. KRITSCHEVSKI and N. E. CHAZANOVA (Acta Physicochim. U.R.S.S., 1939, 10, 199—216).—Theoretical. The application of the Gibbs-Dalton law, the Lewis-Randall rule, and equations of state to gas-vapour solutions at high pressures is discussed. Components must possess parallel isometrics in order to form a regular gas solution. A derived equation enables other isotherms to be calc. from an experimentally determined isotherm. Published data for the system $(X)_2$–I satisfactorily fit in with the equation. The electrostatic theory for solutions of polar vapour in non-polar gas has been developed and an equation has been derived which agrees with data for solutions of H_2O vapour in various gases. As pressure increases, the mol. fraction of vapour in the gas phase decreases to a min. val. and then increases. An equation expressing the conditions obtaining at this min. point has been derived but data confirming it are lacking.

C. R. H.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

KHAZANOVA4N8YE8 600

1. KRICHEVSKIY, I. R.; KHAZANOVA, N. Ye.

2. USSR (600)

"The Ammonia Content in Compressed Hydrogen and Nitrogen in Equilibrium with Liquid Ammonia," Zhur. Fiz. Khim, 13, No. 11, 1939. Moscow, Chemical-Technological Inst. imeni D. I. Mendeleyev. Received 15 Feb. 1939.

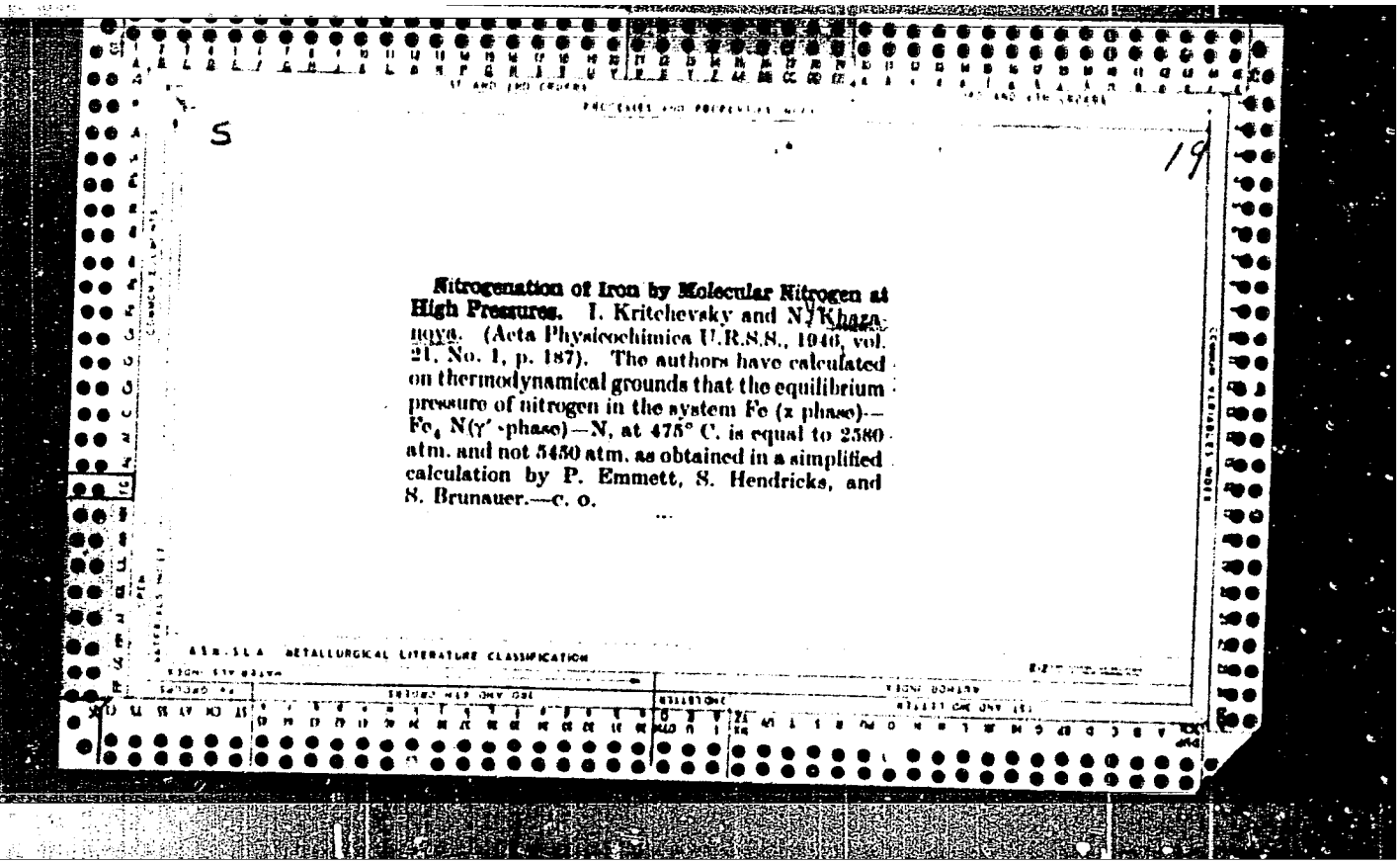
9. [redacted] Report U-1615, 3 Jan. 1952.

CA

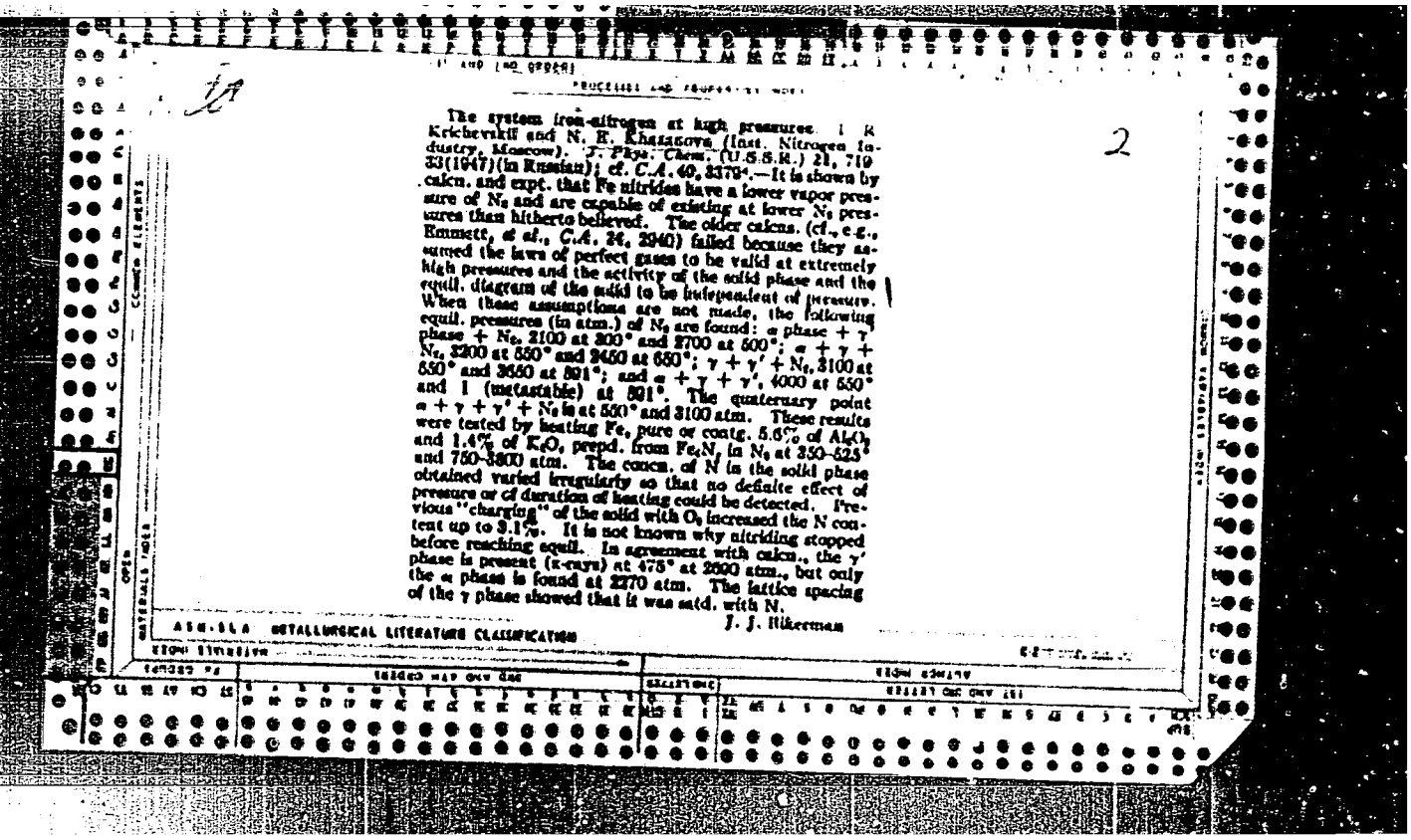
7

Nitriding of iron by molecular nitrogen at high pressures. I. R. Krichevskii and N. E. Khazanova (Inst. Nitrogen Industry, Moscow). *J. Phys. Chem.* (U.S.S.R.) 19, 670(1945).—A thermodynamic calcn. (not reproduced in the paper) gives the equil. pressure for Fe-α phase [illegible] (γ') phase at 475° and 2580 atm. of N. Fe (reduced by H from oxides) takes up at 475° and 2500 atm. 1.3–1.6% of N. X-ray patterns show in the nitrided Fe 82–85% of α-Fe and 15–18% of the γ' phase. J. J. Bikerman

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Nitrogenation of Iron by Molecular Nitrogen at High Pressures. I. Kritchevsky and N. Khazanova. (Acta Physicochimica U.R.S.S., 1946, vol. 21, No. 1, p. 187). The authors have calculated on thermodynamical grounds that the equilibrium pressure of nitrogen in the system Fe (α phase)—Fe_4N(γ′-phase)—N, at 475° C. is equal to 2580 atm. and not 5450 atm. as obtained in a simplified calculation by P. Emmett, S. Hendricks, and S. Brunauer.—c. o.



The system iron-nitrogen at high pressures. I. R. Krichevskiĭ and N. E. Khazanova (Inst. Nitrogen Industry, Moscow). *J. Phys. Chem. (U.S.S.R.)* 21, 719-33(1947)(in Russian); cf. *C.A.* 40, 3379⁴.—It is shown by calcn. and expt. that Fe nitrides have a lower vapor pressure of N_2 and are capable of existing at lower N_2 pressures than hitherto believed. The older calcns. (cf., e.g., Emmett, *et al.*, *C.A.* 26, 2940) failed because they assumed the laws of perfect gases to be valid at extremely high pressures and the activity of the solid phase and the equil. diagram of the solid to be independent of pressure. When these assumptions are not made, the following equil. pressures (in atm.) of N_2 are found: α phase + γ phase + N_2, 2100 at 300° and 2700 at 500°; $\alpha + \gamma + N_2$, 3200 at 550° and 3450 at 650°; $\gamma + \gamma' + N_2$, 3100 at 550° and 3650 at 591°; and $\alpha + \gamma + \gamma'$, 4000 at 550° and 1 (metastable) at 591°. The quaternary point $\alpha + \gamma + \gamma' + N_2$ is at 550° and 3100 atm. These results were tested by heating Fe, pure or contg. 5.6% of Al_2O_3 and 1.4% of K_2O, prepd. from Fe_4N, in N_2 at 350-525° and 750-3800 atm. The concn. of N in the solid phase obtained varied irregularly so that no definite effect of pressure or of duration of heating could be detected. Previous "charging" of the solid with O_2 increased the N content up to 9.1%. It is not known why nitriding stopped before reaching equil. In agreement with calcn., the γ' phase is present (x-rays) at 475° at 2600 atm., but only the α phase is found at 2270 atm. The lattice spacing of the γ phase showed that it was satd. with N.

J. J. Ilkerman

KHAZANOVA, N. E.

58/49T98

USSR/Physics Jun 49
High Pressures
Gases

"Device for the High-Pressure Compressing of Gas," D. S. Tsiklis, N. E. Khazanova, State Inst of Nitrogen Ind, 2 pp

"Zavod Lab" Vol XV, No 6

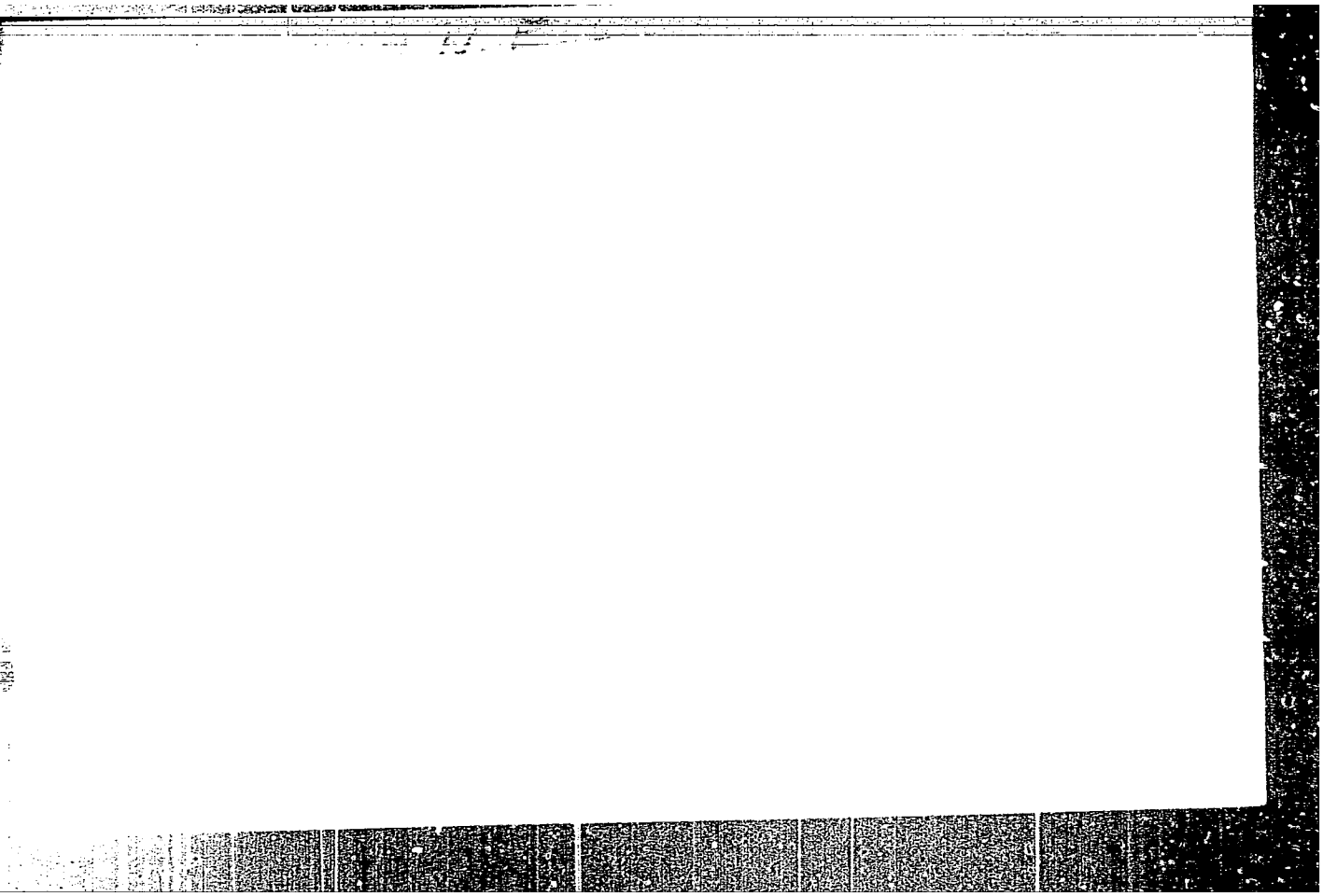
Industry frequently requires large amounts of very pure gas compressed under high pressures. Describes a smiple apparatus developed to fill this need. It is capable of compressing as up to 720 atm. Advantages are many, including: (1) ability to work with small amounts of gas;

[redacted] 58/49T98

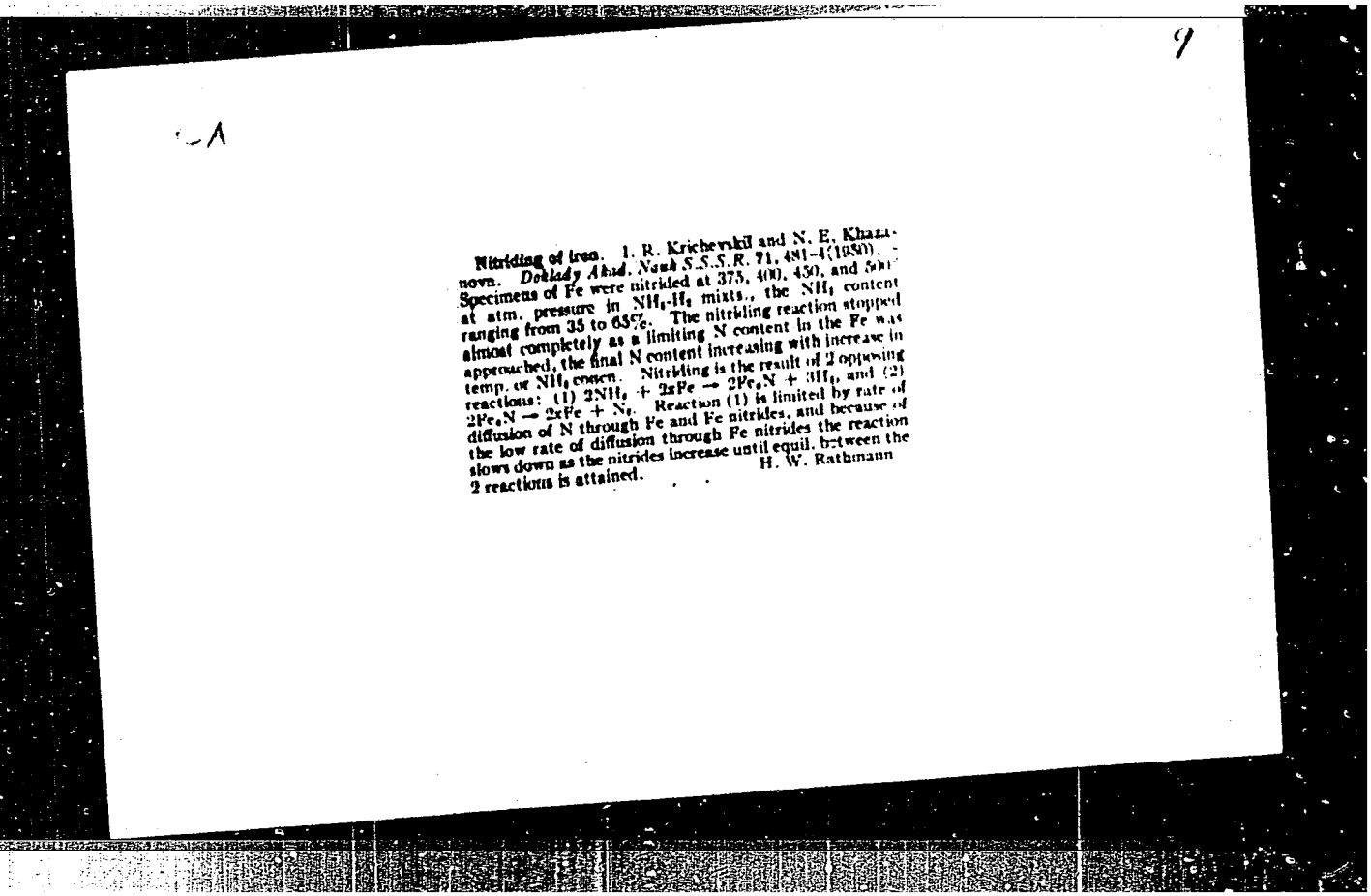
USSR/Physics (Contd) Jun 49

(2) no contact between lubrication oil and gas, thus insuring as purity; and (3) pressure which is obtainable is limited only by size and strength of apparatus.

[redacted] 58/49T98



APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721930001-8"



9

A

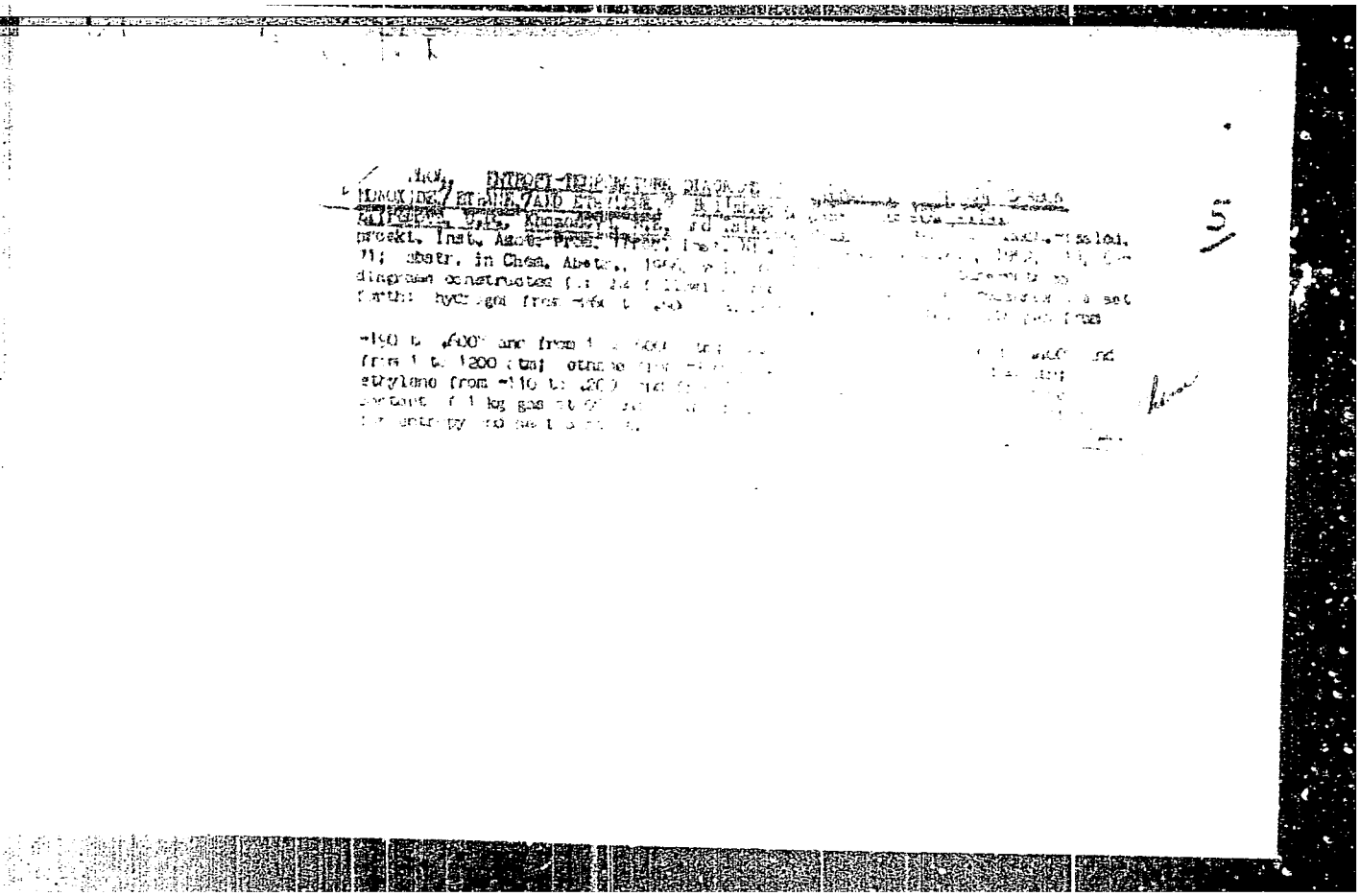
Nitriding of iron. I. R. Krichevskii and N. E. Khazanova. *Doklady Akad. Nauk S.S.S.R.* 71, 481–4 (1950). Specimens of Fe were nitrided at 375, 400, 450, and 500° at atm. pressure in NH_3-H_2 mixts., the NH_3 content ranging from 35 to 65%. The nitriding reaction stopped almost completely as a limiting N content in the Fe was approached, the final N content increasing with increase in temp. or NH_3 concn. Nitriding is the result of 2 opposing reactions: (1) $2NH_3 + 2xFe \rightarrow 2Fe_xN + 3H_2$, and (2) $2Fe_xN \rightarrow 2xFe + N_2$. Reaction (1) is limited by rate of diffusion of N through Fe and Fe nitrides, and because of the low rate of diffusion through Fe nitrides the reaction slows down as the nitrides increase until equil. between the 2 reactions is attained. H. W. Rathmann

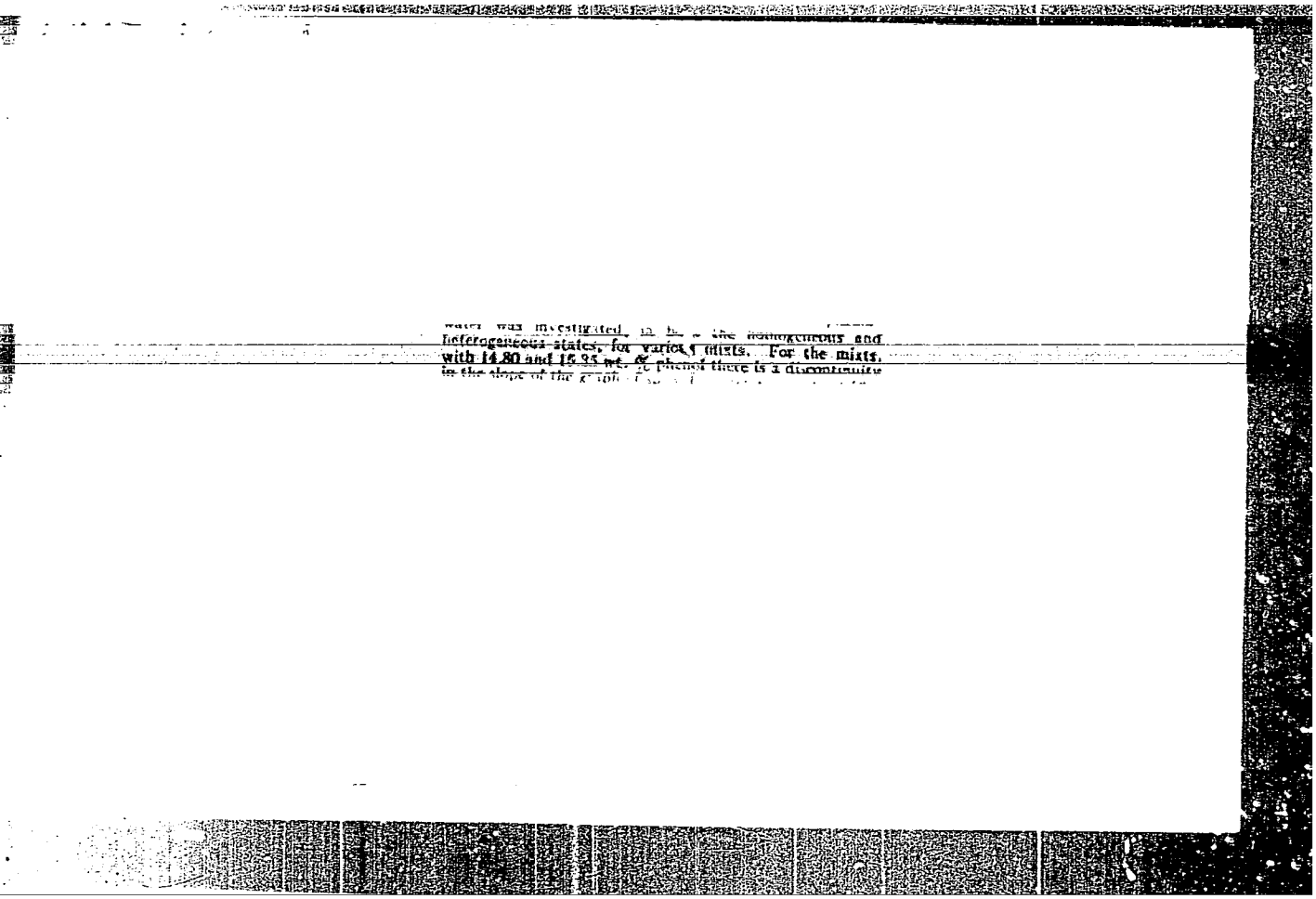
CA

2

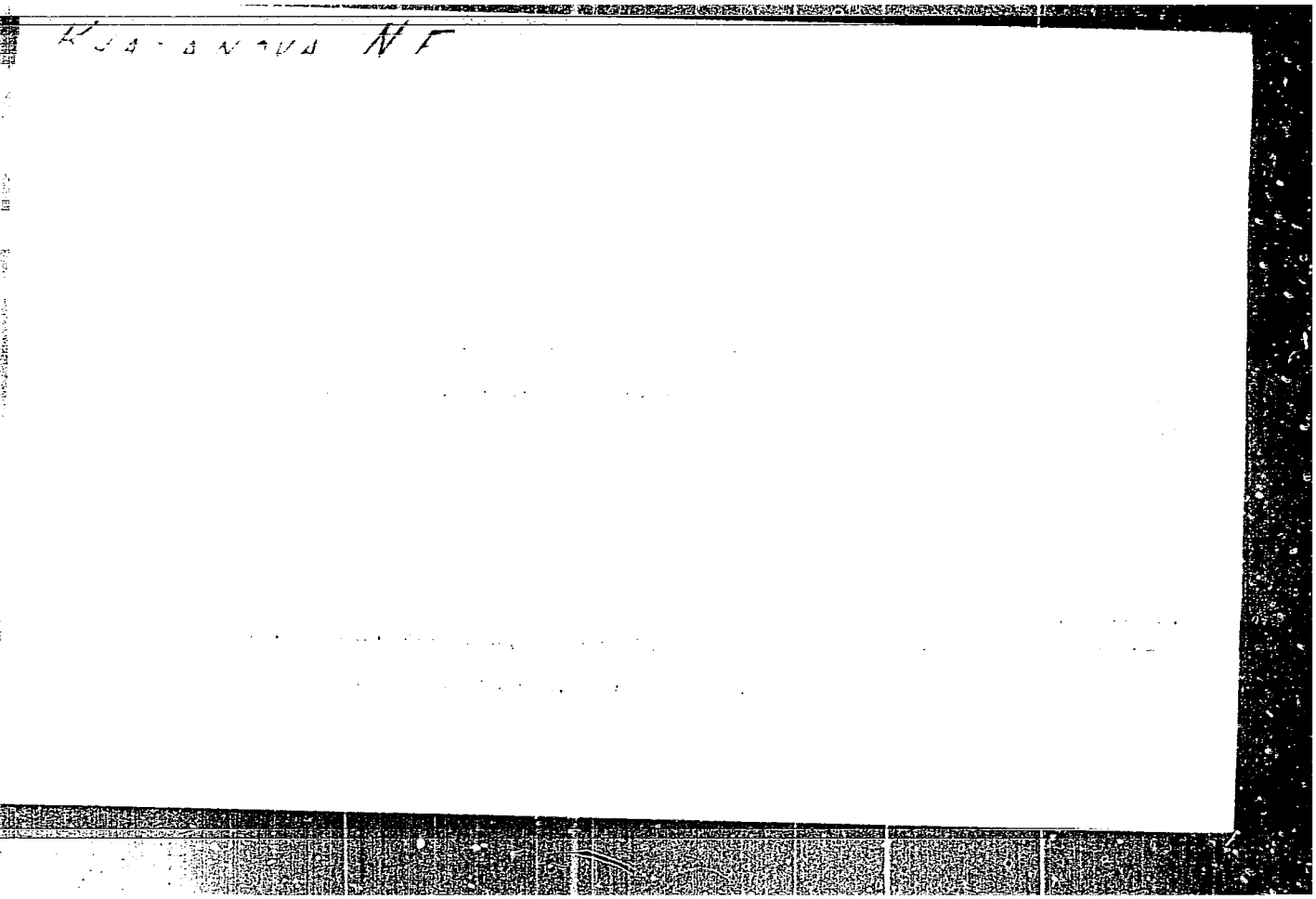
The ε-phase of iron nitride. I. R. Kricheviskii and N. E. Khazanova. *Doklady Akad. Nauk S.S.S.R.* 71, 677–80 (1950).—The equil. const. K_1 for the reaction $[2n/(3-n)]Fe_nN = [2n/(3-n)]Fe_3N + N_2$, where Fe_nN is the ε-phase and Fe_3N is the γ-phase, was calcd. from existing data for the synthesis of NH_3 and for the reaction of Fe nitrides with H_2. The values obtained for log K_1 were: 400° 5.616, 450° 5.558, 500° 5.491, 550° 5.433, and 600° 5.382. By combining these values with data on the fugacity of N_2, the N_2 pressure in equil. with the ε- and γ-phases at 400–600° was calcd. at approx. 13,000–13,600 atm. H. W. R.

Evaluation B-78524, 8 Sep 54





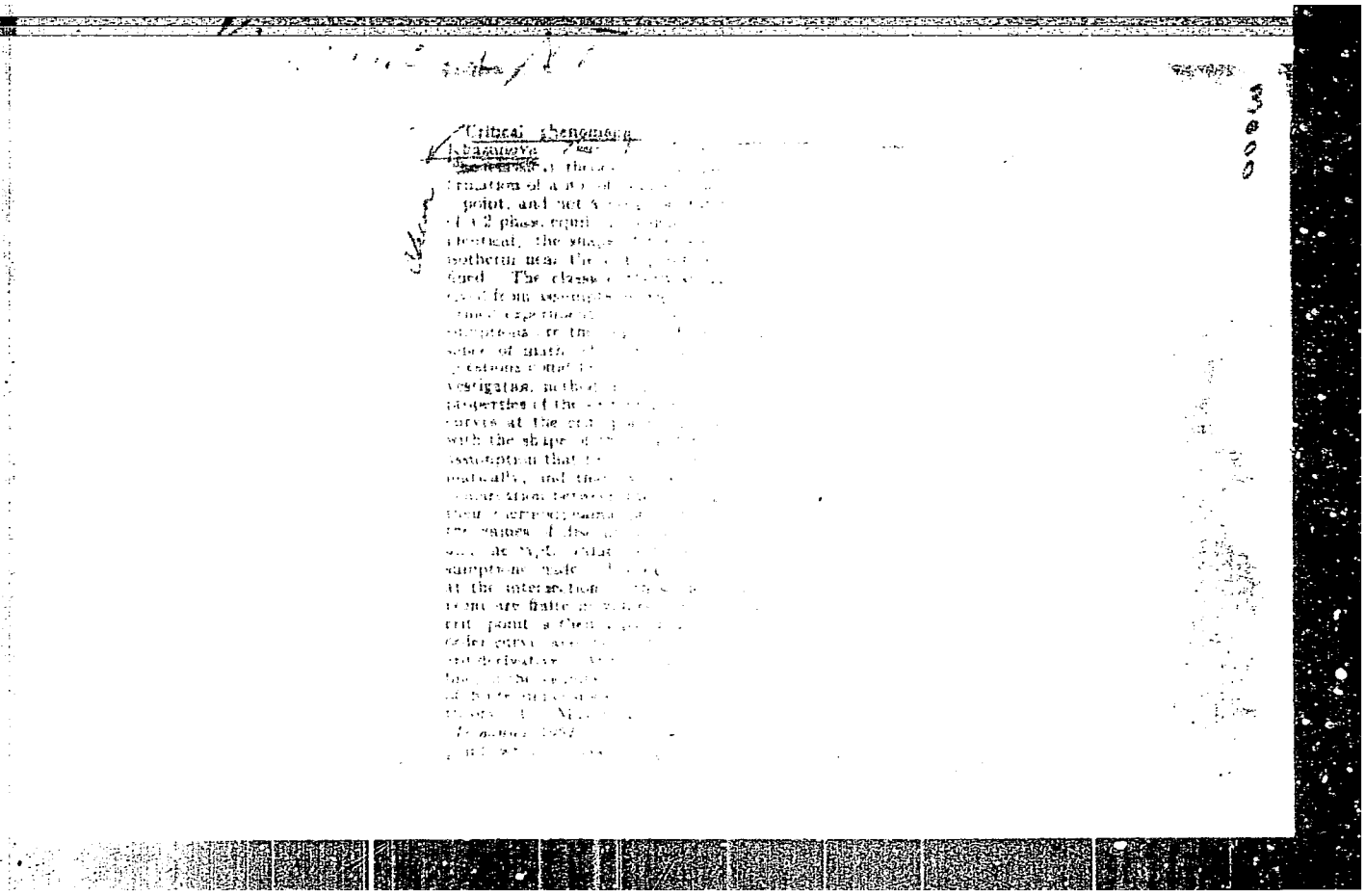
water was investigated, in b... the homogeneous and
heterogeneous states, for varies mixts. For the mixts.
with 14.80 and 15.95 wt. % phenol there is a discontinuity
in the slope of the g...

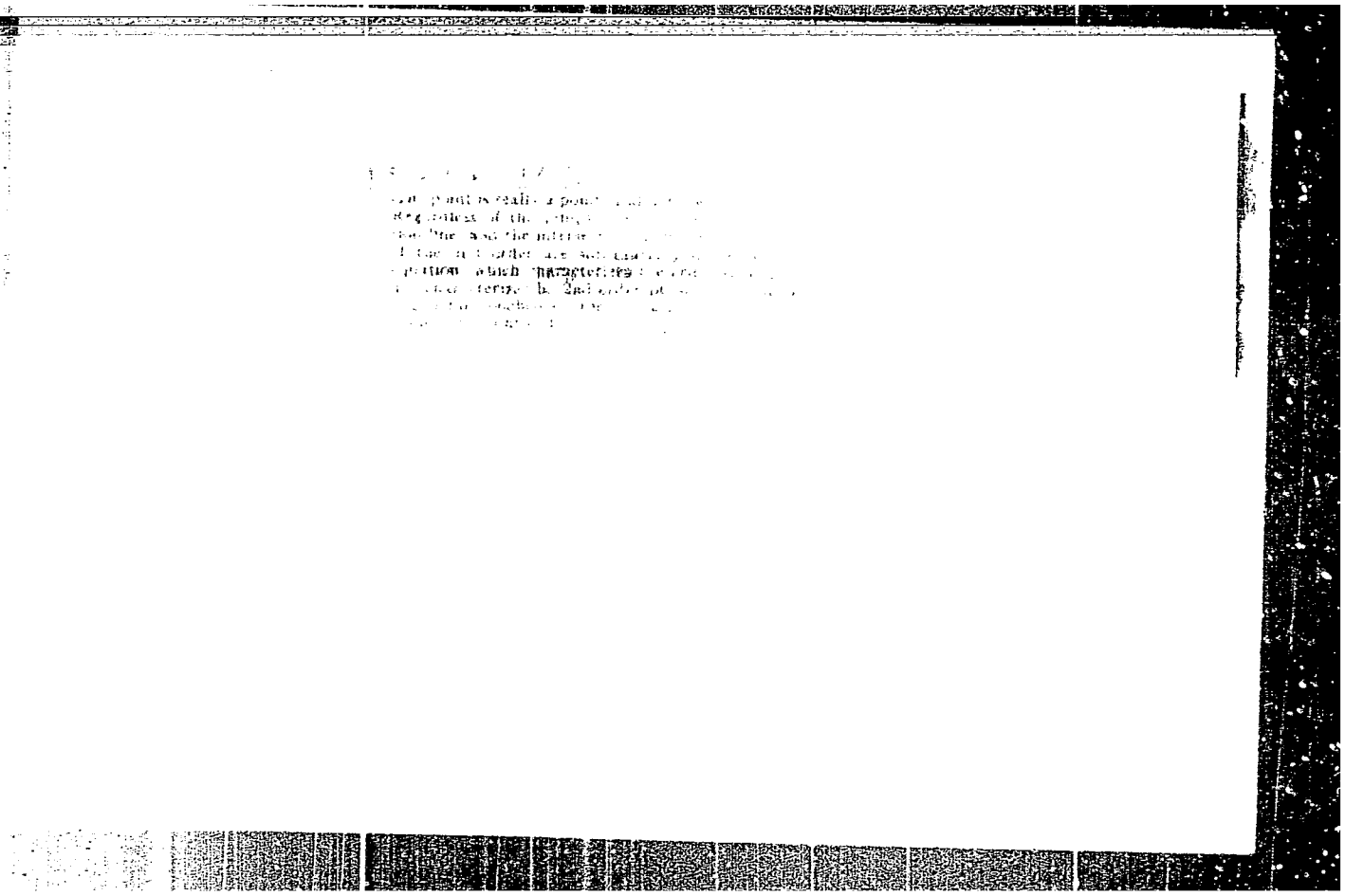


Khazanova, N. Ye.

KRICHEVSKIY, I.R.; KHAZANOVA, N.Ye.; LINSHITS, L.R.

Dilatometry of binary liquid systems in the critical region.
Zhur.fiz.khim. 29 no.3:547-557 Mr '55. (MLRA 8:7)
(Dilatometry) (Systems (Chemistry)) (Liquids)





Periodical : [illegible]

[illegible] Scientific Research and Planning Institute of the Nitrogen Industry

Presented by : Academician A. N. Frumkin, July [illegible], 195[illegible]

KHAZANOVA, N.YE.

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

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3720

Author : Krichevskiy I.R., Khazanova N.Ye.
Title : Formation of Mists at High Pressures

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 2, 422-429

Abstract : A procedure has been worked out for isothermal creation of oversaturation during formation of mist at high pressures, which is based on utilization of the phenomenon of minimum solubility of liquid in gas. Included is a layout of a unit for the investigation of the conditions of mist formation at high pressures, and the procedure of utilizing it is described. Investigated were the systems benzene-nitrogen, methanol-nitrogen, CCl_4-nitrogen, at a pressure of $\sim$900 atm. There was attained a sharp lowering of critical oversaturation, in comparison with the atmospheric pressure, which is, qualitatively, in accord

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AUTHORS: Krichevskiy, I.P., Khazanova, N.Ye., Linshits, L.P. 76-12-16/27

TITLE: Liquid-Vapor-Equilibrium in the Benzene-Methanol-System at High Pressures (Ravnovesiye zhidkost'-par v sisteme-benzol-metanol pri vysokikh davleniyakh).

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 12, pp.2710-2716 (USSR)

ABSTRACT: The limiting curves of the liquid-vapor-equilibrium in the system of benzene-methanol at various compositions and temperatures from 150° C up to the critical temperature were investigated by means of the method of soldered ampules. The volumes of the benzene-methanol-system were measured at the limiting curves of the liquid-vapor-equilibrium. The investigated mixtures contained 16.7, 34.9, 50.6, 63.4 and 83.1 percentage by weight of benzene. The critical temperatures and volume-values were found for each of these mixtures and the critical t-x- and v-t curves were drawn. v - is the molar volume of the mixture of a given composition, x - benzene content in percentage by weight. The critical t-x-curve has a minimum which is observed with systems with steadily boiling mixtures under maximum vapor-pressure. These systems usually have such a minimum at the vapor-phase-line of the v-x-limiting curves. It is shown that the limiting curves occupy the whole range of the composition of the mixture at tempera-

tures below the temperature of the minimum at the critical curve (238.5) and that with all temperatures for which diagrams were plotted, they have minima at the vapor-phase-line. At temperatures above the temperature-minimum at the critical curve, the limiting curves embrace only a part of the compositions adjacent to the axis of pure benzene and show critical points. It is shown that in the v-x-diagram for the benzene-methanol-diagram at 240° C (critical temperature of methanol) only one field of the heterogeneous equilibrium was determined, instead of the two expected. In the case of a further increase of temperature, this field embraces the reducing interval of composition. The minima at the vapor-phase-line of the v-x-limiting curves indicate the presence of azeotropes in the system. The composition of the minimum coincides with that below the maximum vapor-pressure only then, if and when the vapor-phase follows the laws of the ideal gases. It was assumed that the investigated mixture follows these laws and moreover the data available in literature on the composition of azeotrope mixtures were applied for this system at temperatures up to 131° C [Ref. 7] . The curves for the dependence of

the boiling temperature of the aceotrope on its composition were drawn upon these bases. At a benzene content of 17 percentages by weight, and 238.5° C the t-x-curve of the aceotrope attains the critical t-x-curve immediately in the proximity of the minimum point. The data P-v-t for the benzene-methanol-system in reference 1, and the here obtained data for computing the pressures at equilibrium for three mixture-compositions were applied and the critical P-x- and P-t-curves were drawn. The P-v-limiting curves for the three mixtures were constructed from the here obtained data for the volumes of the phases with the investigated system at the limiting curve at various temperatures and compositions, as well as according to the data of reference 1. (Mixtures with 54.9, 70.9 and 83.0 percentage by weight of benzene at 150°, 200°, 250° and 300° C). The critical P-t-curve was drawn according to the values for the critical parameters of pure benzene, methanol, and the three mixtures, as well as according to the data on the temperature-minimum at the critical curve for this system. This curve differs from those described in the references 8 and 9. It is shown that with the benzene-methanol-system the relation set up there is not observed: the component with

the least critical temperature (methanol) has the highest critical pressure. On the other hand, benzene shows at higher critical temperatures the lowest critical pressure. Finally, also the P-x-isotherms for the liquid-phase at 150° to 220° C, and isotherms for the liquid- and vapor phase at 240° and 250° C were constructed. There are 8 figures, 2 tables, and 9 references, 2 of which are Slavic.

ASSOCIATION: Institute of Nitrogen Industry, Moscow (Institut azotnoy promyshlennosti, Moskva).

SUBMITTED: September 17, 1956

AVAILABLE: Library of Congress

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., 2o-119-5-37/59
Linshits, L. R.

TITLE: Diffusion Within the Critical Range of Ternary Solutions (Diffuziya v kriticheskoy oblasti troynykh rastvorov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 5, pp. 975-977 (USSR)

ABSTRACT: The aim of the present work is restricted to the solution of the main problem, namely the clear determination of the problem, whether a noticeable enrichment of the solution with the third component occurs (playing the part of a small addition to the binary system) in the critical range because of molecular diffusion. The investigation of the diffusion in ternary solutions was for various reasons carried out by the example of the trimethylamine-water system with an addition of a small amount of butylamine. The investigation was carried out by means of the method of capillaries (about ~2mm diameter and about ~ 4o mm length). The experimental lasted 5o-9o hours. The thermal stabilizing was accurate

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Diffusion Within the Critical Range of Ternary Solutions 20-119-5-37/59

to an error of ± 0,05°C. The investigation of the diffusion in the ternary mixture is always carried out with solutions of the same ratio butylamine: triethylamine (about ~ 1:14), and always at the same temperature of 18°C. In order to reach exact results a great gradient of the concentrations of the diffusing component was selected for the investigations. The following can be seen from the data mentioned in 2 tables: The diffusion coefficient of the butylamine is of the same order within the critical range and in diluted solutions. The little smaller value of the diffusion coefficient in diluted solutions is explained by their small viscosity as compared to concentrated solutions. Thus the diffusion velocity of butylamine does not decrease within the critical range while the diffusion velocity of triethylamine within this range strongly decreases. However, diluted solutions the diffusion coefficient of triethylamine has the same order as the diffusion coefficient of butylamine. According to the theoretical conditions the system was enriched with butylamine. The ratio butylamine: 1 : 6,

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KHAZANOVA, N. Ye.

24(8) PHASE I BOOK EXPLOITATION SOV/2539

Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk

Termodinamika i stroyeniye rastvorov; trudy soveshchaniya... (Thermodynamics and Structure of Solutions; Transactions of the Conference Held January 27-30, 1958) Moscow, Izd-vo AN SSSR, 1959. 295 p. 3,000 copies printed.

Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences; Ed. of Publishing House: M. G. Yegorov; Tech. Ed.: T. V. Polyakova.

PURPOSE: This book is intended for physicists, chemists, and chemical engineers.

COVERAGE: This collection of papers was originally presented at the Conference on Thermodynamics and Structure of Solutions sponsored by the Section of Chemical Sciences of the Academy of Sciences, USSR, and the Department of Chemistry of Moscow State University, and held in Moscow on January 27-30, 1958. Officers of the conference are listed in the Foreword. A list of other reports also read at the conference, but not included in this book, are given. Among the problems treated in this work are: electrolytic solutions, ultrasonic measurement, dielectric and thermodynamic properties of various mixtures, spectroscopic analysis, etc. References accompany individual articles.

5 (4)

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., SOV/76-33-7-7/40
Tsekhanskaya, Yu. V., Linshits, L. R.

TITLE: Critical Phenomena in the System Hexamethylene Imine - Water. I. Equilibrium Limiting Curve of Liquid - Liquid Near the Critical Point

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 7, pp 1484 - 1491 (USSR)

ABSTRACT: From the data of the classical theory on the critical phenomena new thermodynamic relations can be obtained (Refs 1-3) which combine the course of the limiting curve (LC) near the critical point (CP) with the jumps of the derivatives of some properties during the transition of the system from the homogeneous to the heterogeneous state. In previous papers (Refs 4-8) it was found for two systems by the method of the jump of the derivative $(\partial v/\partial t)_{p,x}$ of the course of the (LC) near the critical point that the limiting curves of these systems are second-degree parabolas. In continuation of these investigations the authors analyzed the system hexamethylene imine (I) - water (II). They investigated the course of the (LC) (Fig 1, Table 1) near the

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SOV/76-33-7-7/40

Critical Phenomena in the System Hexamethylene Imine - Water. I. Equilibrium Limiting Curve of Liquid - Liquid Near the Critical Point

(CP), the partial and total vapor pressure, the specific weight, the refractive index, the viscosity, and the diffusion coefficients within the wide range of temperature and composition. Investigations were carried out near the lower (CP) at 66.9°C and 22.5 wt% (I) by means of a gravimetric dilatometer (Refs 11-14) (Fig 1) which was contained in a thermostat. The authors investigated six systems with a hexamethylene imine content of 13.7, 20.1, 24.32, 27.6, 31.4, and 35.6 wt% at various temperatures (Table 2). On the basis of the results of the specific volumes, volume-temperature curves were plotted, and herefrom the authors calculated the derivatives $(\partial v/\partial t)_{P,x}$ on the (LC) for the heterogeneous and the homogeneous range as well as the jumps of the derivatives at the point of intersection of the (LC). Results showed that the jump of the derivative $(\partial v/\partial t)_{P,x}$ attains a limit in the critical point, and thus the (LC) is a second-degree parabola near the (CP). In (Refs 18-20), the jumps of $c_{P,x}$ and $(\partial v/\partial t)_{P,x}$ of some binary solutions and

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Critical Phenomena in the System Hexamethylene Imine - Water. I. Equilibrium Limiting Curve of Liquid - Liquid Near the Critical Point

SOV/76-33-7-7/40

the jumps of c_v of several pure substances were investigated, and it was found that these jumps always attain limits in the (CP). It is therefore assumed that the (LC) of the liquid - liquid and of the liquid - vapor in the systems under investigation is a second-degree parabola near the (CP). There are 5 figures, 2 tables, and 21 references, 14 of which are Soviet.

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti (State Institute for Nitrogen Industry)

SUBMITTED: September 11, 1957

Card 3/3

5(4)
AUTHORS: Khazanova, N. Ye., Linshits, L. R. (Moscow) SOV/76-33-8-24/39

TITLE: Critical Phenomena in the System Hexamethylenimine - Water. II. Some Physicochemical Properties of the System Hexamethylenimine - Water

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 8, pp 1811-1812 (USSR)

ABSTRACT: In the course of the investigations of the critical phenomena in the system hexamethylenimine (I) - water (II) it became necessary to determine a series of physicochemical properties of this system as well. The specific weight of the system (I) - (II) was determined for compositions of 4 - 44% by weight of (I) at temperatures between 13 and 65°C (Table 1). The measurements were made with a double capillary pycnometer, the meniscus readings were taken by means of a cathetometer. The viscosities of the system (I) - (II) were measured by means of a Heppler viscosimeter for temperatures between 0 and 66°C (Table 2). The refractive index was measured by a refractometer RLU for temperatures ranging from 10 to 50°C (Table 3). There are 3 tables and 2 Soviet references.

Card ~~1/2~~

KHAZANOVA, N. Ye.

3c

PHASE I BOOK EXPLOITATION SOV/5469

Soveshchaniye po kriticheskim yavleniyam i flyuktuatsiyam v rastvorakh. Moscow, 1960.

Kriticheskiye yavleniya i flyuktuatsii v rastvorakh; trudy soveshchaniya, yanvar' 1960 g. (Critical Phenomena and Fluctuations in Solutions; Transactions of the Conference, January 1960) Moscow, Izd-vo AN SSSR, 1960. 190 p. 2,500 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova. Khimicheskiy fakul'tet.

Responsible Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences, Professor; Ed. of Publishing House: E. S. Dragunov; Tech. Ed.: S. G. Tikhomirova.

PURPOSE: This collection of articles is intended for scientific personnel concerned with chemistry, physics, and heat power engineering.

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Critical Phenomena and Fluctuations SOV/5469

COVERAGE: The book contains 24 of the 26 reports read at the Conference on Critical Phenomena and Fluctuations in Solutions organized by the Chemical Division of Moscow State University, January 26-28, 1960. The reports contain results of investigations carried out in recent years by Soviet physicists, chemists, and heat power engineers. The Organizing Committee of the Conference was composed of Professor Kh. I. Amirkhanov, A. Z. Golik, I. R. Krichevskiy (Chairman), V. K. Semenchenko, A. V. Storonkin, I. Z. Fisher, and M. I. Shakhparonov (Deputy Chairman). References accompany individual articles.

TABLE OF CONTENTS:

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Critical Phenomena and Fluctuations SOV/5469

Critical Phenomena and Fluctuations SOV/5469

Card 8/9

AVAILABLE: Library of Congress (QD545.S73)

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10-28-61

S/170/60/003/010/020/023X
B019/B054

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., Linshits, L. R.

TITLE: Diffusion of Gases Near the Critical Point

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 10, pp. 117-118

TEXT: In the introduction, the authors point out that it is very difficult to investigate the molecular diffusion of gases near the critical point. They observed visually the diffusion of iodine in carbon dioxide. Iodine pressed into tablets and carbon dioxide were introduced into thick-walled glass ampoules. The diffusion of iodine in carbon dioxide causes a discoloration of carbon dioxide, and thus the diffusion of iodine in liquid and gaseous carbon dioxide was investigated. In this way, a diffusion coefficient of $1 \cdot 10^{-5}$ cm^2/sec at $20^{\circ}C$ was determined in liquid carbonic acid. From the results obtained, the authors conclude that the diffusion coefficient near the critical point is smaller than $1 \cdot 10^{-6}$ cm^2/sec, and that the diffusion coefficient near the critical

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point is reduced by at least three orders of magnitude. There are 4 references: 2 Soviet and 2 Scandinavian.

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti, g. Moskva
(State Institute of the Nitrogen Industry, Moscow)

SUBMITTED: April 18, 1960

Card 2/2

KRICHEVSKIY, I.R.; KHAZANOVA, N.Ye.; TSEKHANSKAYA, Yu.V. (Moscow)

Critical phenomena in the system hexamethylenimine - water. Part 3: Diffusion in the vicinity of the critical point. Zhur.fiz.khim. 34 no.6:1250-1254 Je '60. (MIRA 13:7)

1. Institut azotnoy promyshlennosti.
(Hexamethylenimne) (Diffusion) (Critical point)

S/076/60/034/008/018/039/XX
B015/B063

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., Smirnov, L. P.

TITLE: Critical Phenomena in he Hexamethylenimine - Water System. IV. Total Vapor Pressure

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 8, pp. 1702 - 1705

TEXT: The critical isotherm of total pressure above binary solutions like the isotherms of the chemical potential and partial pressure, exhibits an almost horizontal section in which the vapor pressure is practically independent of the composition of the solution. This effect of the critical point also extends to the homogeneous region, in a wide range of composition and temperature. The authors studied the thermodynamics of binary solutions near the critical point in the hexamethylenimine - water system, which has its lower critical point at 68.1°C and 24.8 percent by weight of hexamethylenimine (Ref.2). In doing so, they measured the total vapor pressure above the solutions with 5-55 percent by weight of hexamethylenimine from 40° to 74°C by the isotheniscope method. The latter has

been developed by Smith and Mensies (J.Amer.Chem.Soc., 32, 1412, 1910) and is described here. Both instrument and method were checked by determining the vapor pressure of bidistilled water. The measurement error of the total vapor pressure above solutions of different compositions is indicated as being 0.10 - 0.20 mm Hg. The values obtained from the diagram $\log P = f(1/T)$ were interpolated for integral temperature values and tabulated (Table 1). From this the $P = f(x)$ diagram was drawn and the limiting curve was plotted therein, the data on the liquid - liquid equilibrium in the system concerned being derived from Ref.2. The $P = f(x)$ diagram (Fig.3) shows that the effect of the critical point extends over a wide range of temperature and composition. A thermodynamic interpretation of the data given here will be offered in a later report. There are 3 figures, 2 tables, and 4 references: 2 Soviet, 1 US, and 1 German.

ASSOCIATION: Institut azotnoy promyshlennosti Moskva (Institute of the Nitrogen Industry, Moscow)

SUBMITTED: September 26, 1958

S/076/60/034/009/025/041XX
B020/B056

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., and Linshits, L. R.

TITLE: Critical Phenomena in the System Hexamethylene Imine - Water. V. Partial Pressures of the Components

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 9, pp. 1920 - 1927

TEXT: For the purpose of explaining the characteristics of the behavior of a substance in the critical point and the effect produced by these characteristics upon the behavior of a substance near the critical point, it is first necessary to determine the dependence of the chemical potential of the component upon the composition of the mixture in these regions. For the temperature dependence of the differentials of isothermal and isobaric lines upon the partial pressures of the components from the composition in the critical point of the binary solution the equations

$$\left[(\partial/\partial T)(\partial P_1)/(\partial N_2)_{P,T}\right]_{P,N_2;k} = \left[(P_{1,k}N_{2,k})/(RT_k^2)\right]\left[(\partial^2 H/\partial N_2^2)_{P,T,k}\right] \quad (26) \text{ and}$$

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$$\left[(\partial/\partial T)\,(\partial P_2/\partial N_2)_{P,T}\right]_{P,N_2,k} = -\left[(P_{2,k}N_{1,k}/RT_k^2)\cdot(\partial^2 H/\partial N_2^2)\right]_{P,T,k} \qquad (27)$$

are derived, where k is the index of the critical phase. The partial pressures of the components in the critical range of the binary solution were investigated in the system hexamethylene imine - water with a lower critical point at 68.1° and 24.8 % by weight of hexamethylene imine (Ref. 5). The investigation was carried out by means of the dynamic method, where only the equilibrium composition of the liquid and of the vapor was determined. The total vapor pressure over the solutions was separately determined (Ref. 6). The equilibrium is established only slowly near the critical point of a binary system, and therefore particular care was taken in order that the saturators be used effectively. Helium was the carrier gas. A scheme of the arrangement is given in Fig. 1. The equilibrium in the system hexamethylene imine - water was measured in solutions with five different compositions at 50.0, 62.1, and 67.6°. From the equilibrium compositions of the vapor- and liquid phases, the partial pressures of the components were determined (the partial pressures of hexamethylene imine

are given in Fig. 2). The proportionality of the partial pressure of the components with concentration holds only for diluted solutions (with 3 - 4% by weight of hexamethylene imine). At temperatures near critical one, the partial pressure of hexamethylene imine from a concentration of about 8% onward remains constant within a broad range of compositions. At 50°, the partial pressure within the range of this composition increases somewhat with concentration, but its dependence of composition remains very low, which fully corresponds to the conditions given in the thermodynamic equations (26) and (27). In solution concentrations near the critical one, the composition of the gaseous phase changes only little with temperature. The temperature dependence p_2/p_1 for three ternary systems is shown in Fig. 3: triethyl amine - water, phenol - water, and hexamethylene imine - water, from which it may be seen that this function converges to zero when approaching the critical temperature. Between evaporation and the solution heats of the components at the critical point, a relation is obtained, which does not follow from the general thermodynamics of the critical state, namely

$$\Delta H_{1,ev} - \Delta H_{2,ev} = \Delta H_{1,k,sol} - \Delta H_{2,k,sol}.$$

Critical Phenomena in the System Hexamethylene Imine - Water. V. Partial Pressures of the Components

S/076/60/034/009/025/041XX
B020/B056

There are 3 figures, 1 table, and 9 references: 6 Soviet, 1 US, and 2 German.

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti, Moskva (State Institute of the Nitrogen Industry, Moscow)

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B015/B064

AUTHORS: Krichevskiy, I. R., Khazanova, N. Ye., Svetlova, G. M. (Deceased), and Panina, R. S.

TITLE: Total Vapor Pressure Over the Solutions of Triethyl Amine - Water in the Critical Range

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 10, pp. 2160 - 2166

TEXT: Investigations of the total vapor pressure over binary solutions in the vicinity of the critical point are interesting for two reasons. On the one hand, it is important to establish according to which laws a distribution of the critical phenomena in the homogeneous region takes place, on the other hand, it is important to study the problem of jumps of the intensive quantities when intersecting the limiting curve both in the critical point and at a distance from it; the importance of this has already been stressed by the authors of the present paper (Ref. 1). For the mentioned reasons the authors

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Total Vapor Pressure Over the Solutions of Triethyl Amine - Water in the Critical Range

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investigated the critical parameters for the equilibrium liquid - liquid in the system triethyl amine - water. For this purpose specially purified triethyl amine was used (specific weight at $25^{\circ}C = 0.72345\ g/cm^3$, refractive index at $25^{\circ}C\ n_D = 1.398$).

The vapor pressure of triethyl amine was determined (Table 3) and the total pressure of vapor over the system triethyl amine - water in the temperature range of from 10° to 25°C (Fig. 2) and the limiting curve for the equilibrium of the system investigated, i.e. the critical solution temperature (Table 4, Fig. 1). As may be seen from Fig. 2, the isosteric curve of the solution with a composition close to that of the critical (30.56 wt% triethyl amine) passes continuously over into the limiting curve, while the curves for the solutions with different compositions form an angle with the equilibrium curve. The experimental values and the calculated ones show that the derivation of the values of the total pressure according to temperature

$$(\partial P_{total} / \partial T)_{N_2}$$

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Total Vapor Pressure Over the Solutions of Triethyl Amine - Water in the Critical Range

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as well as the derivations of the other intensive values show no jump on intersecting the limiting curve at the critical point. This coincidence of the experimental and calculated data confirms the accuracy of the theoretical assumptions. From Diagram logP = f(1/T) (Fig. 2) the values for the total pressure over the solution were interpolated for integral values of temperature (Table 5), the P - x diagram plotted (Fig. 3), the limiting curve drawn, and thus, the values of the vapor pressures on the boundary line obtained (Table 6). Fig. 3 shows that at concentrations close to the critical point a slight dependence of the total vapor pressure over the solutions on the concentration is to be observed in the wide temperature range. This corresponds fully to the thermodynamic characteristics of the behavior of substances in the vicinity of the critical point. D. Mayer and V. F. Alekseyev are mentioned. There are 3 figures, 6 tables, and 11 references: 7 Soviet, 2 British, 1 German, 1 French.

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1 Температура, °C	2 Давление, мм рт. ст.	3 Температура, °C	4 Давление, мм рт. ст.
13,58	36,7	40,55	135,1
18,07	48,5	60.25	292,5
23,50	62,8	79,12	555,15
27,57	76,6	89,4°	760 •
32,20	94,9		

1 Концентрация триптиламина, % вес	2 Температура, °C	3 Давление, мм рт. ст.	4 Концентрация триптиламина, % вес.	5 Температура, °C	6 Давление, мм рт. ст.
7,7	24,0	78,7	18,9	18,6	57,2
8,0	22,0	70,4	23,2	18,4	56,8
11,4	20,0	62,6	30,0	18,35	56,7
15,1	19,0	59,0	32,2°	18,33°	56,6°

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