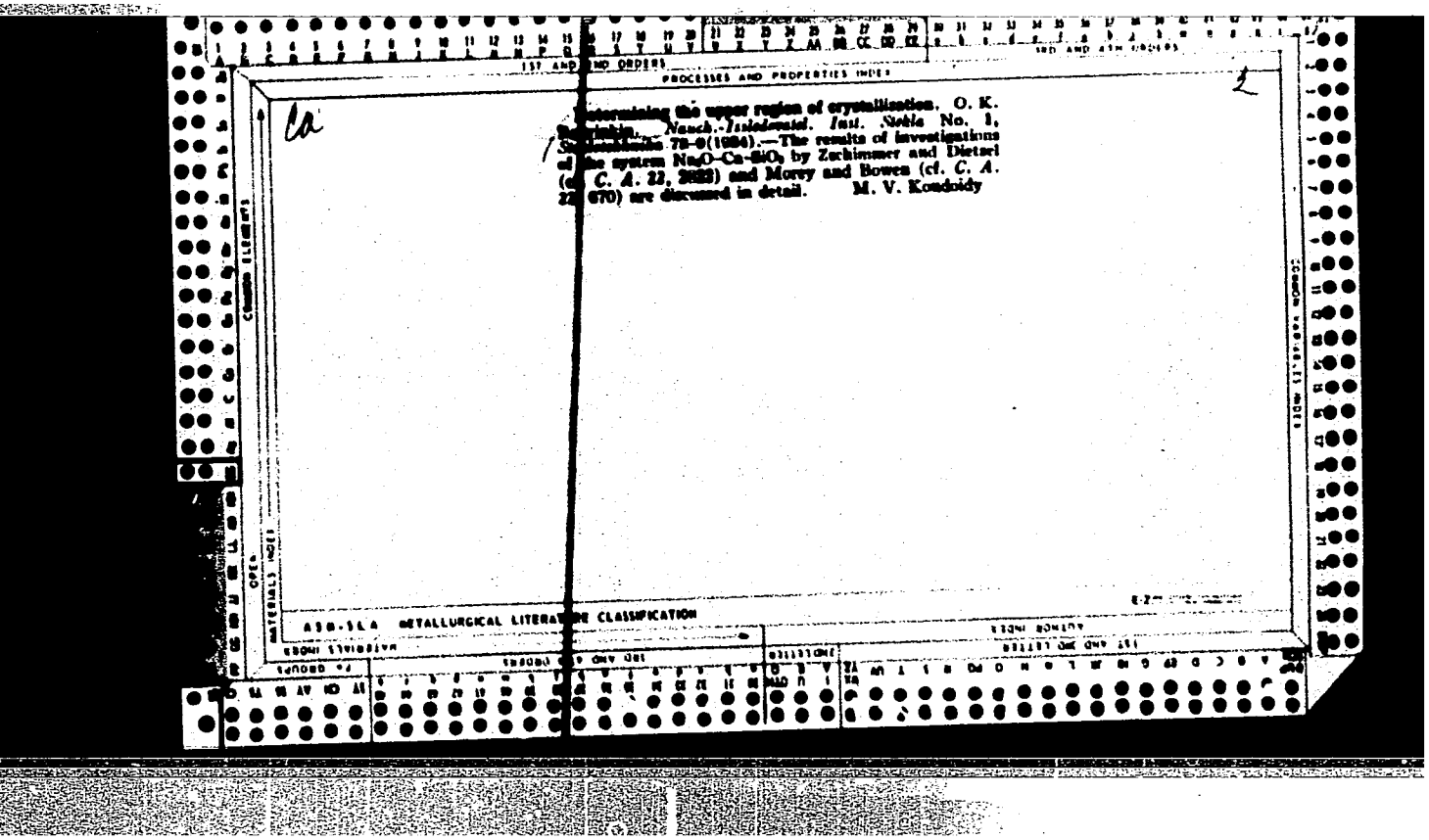
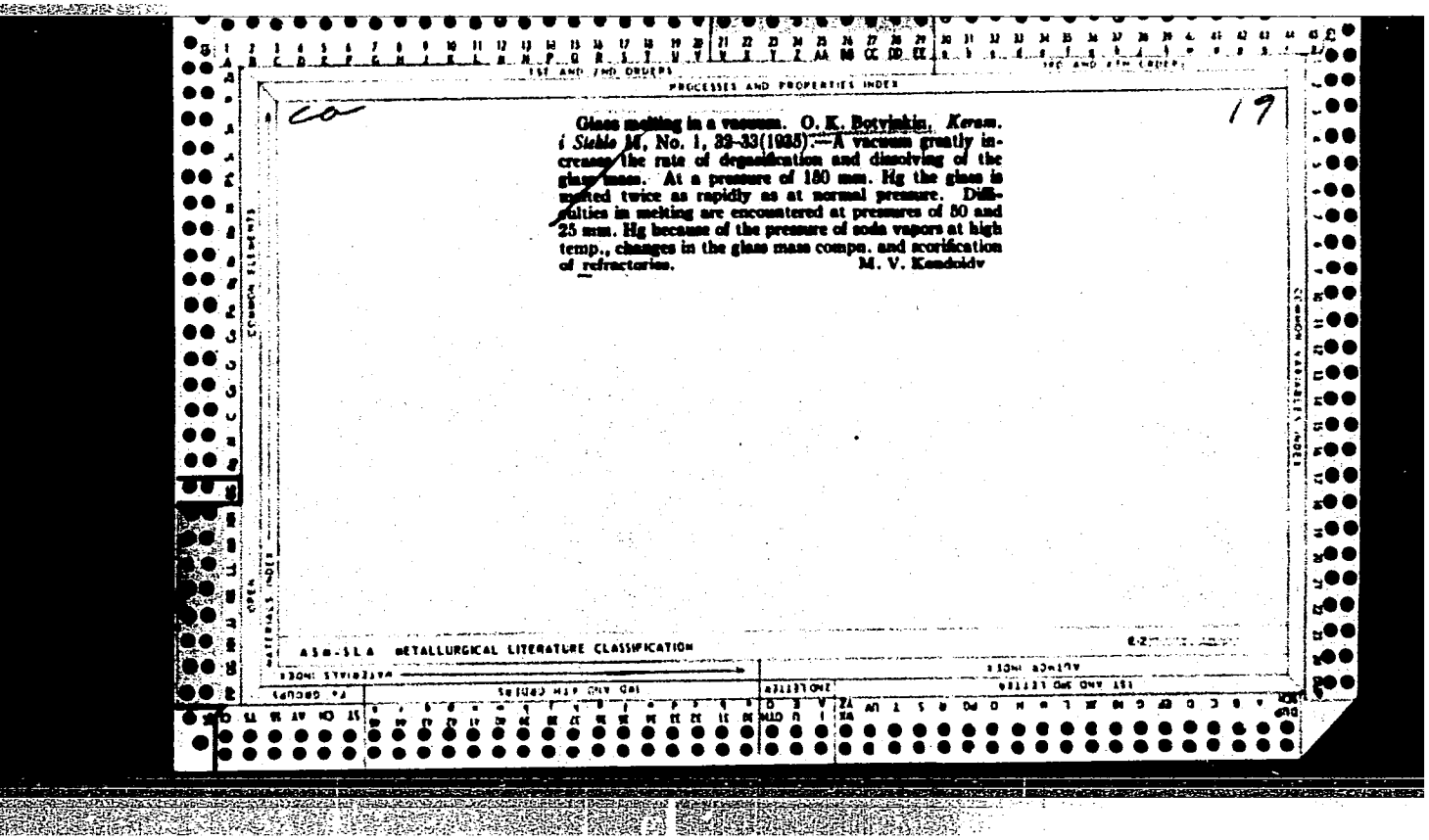




PROCESSES AND PROPERTIES INDEX

Ca

19

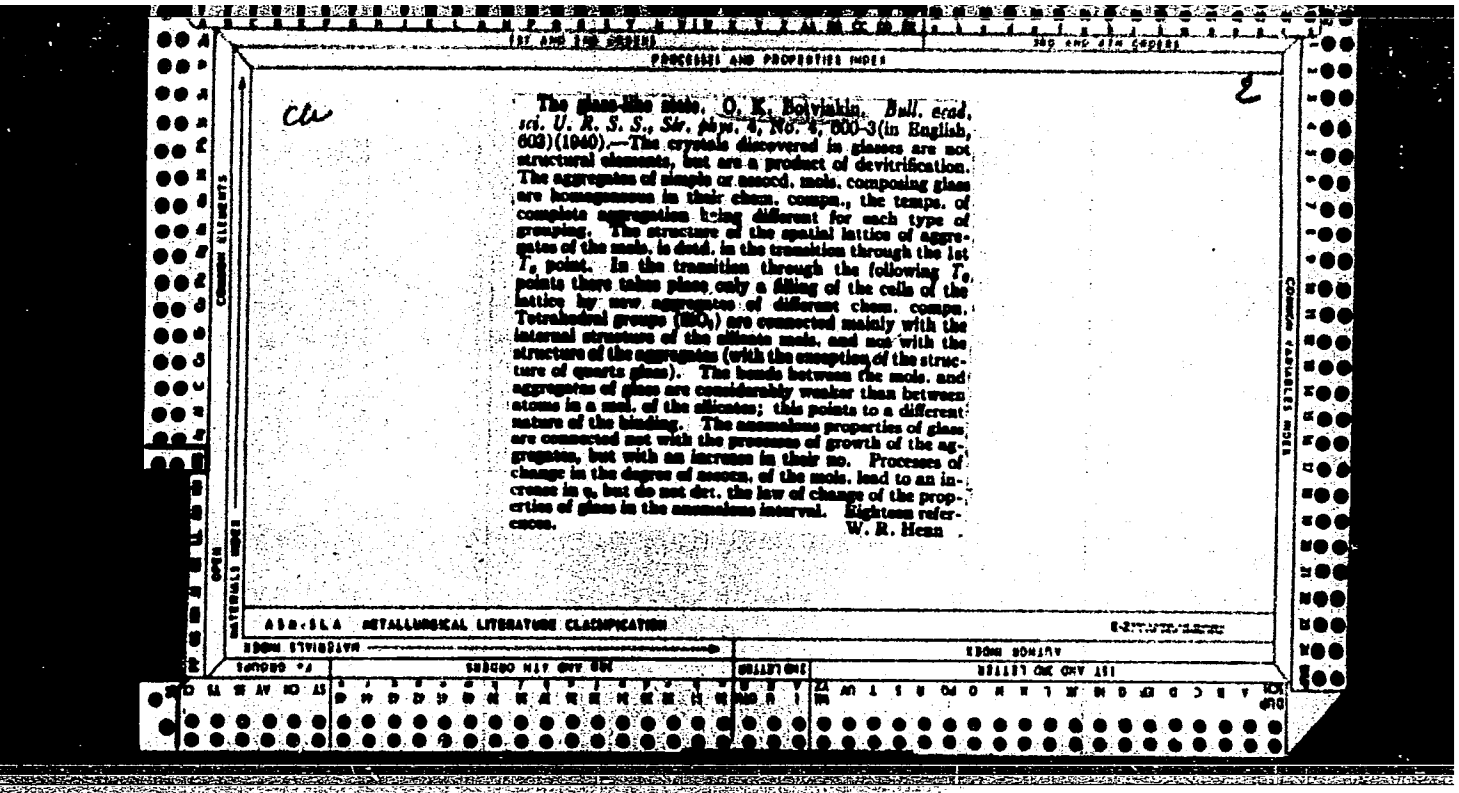
Glass melting in a vacuum. O. K. Botvinkin. *Keram. i Steklo* M, No. 1, 32–33(1935).—A vacuum greatly increases the rate of degasification and dissolving of the glass mass. At a pressure of 180 mm. Hg the glass is melted twice as rapidly as at normal pressure. Difficulties in melting are encountered at pressures of 50 and 25 mm. Hg because of the pressure of soda vapors at high temp., changes in the glass mass compn. and scorification of refractories. M. V. Kandaidv

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BOTVINKIN, Oleg Konstantinovich, 1904-

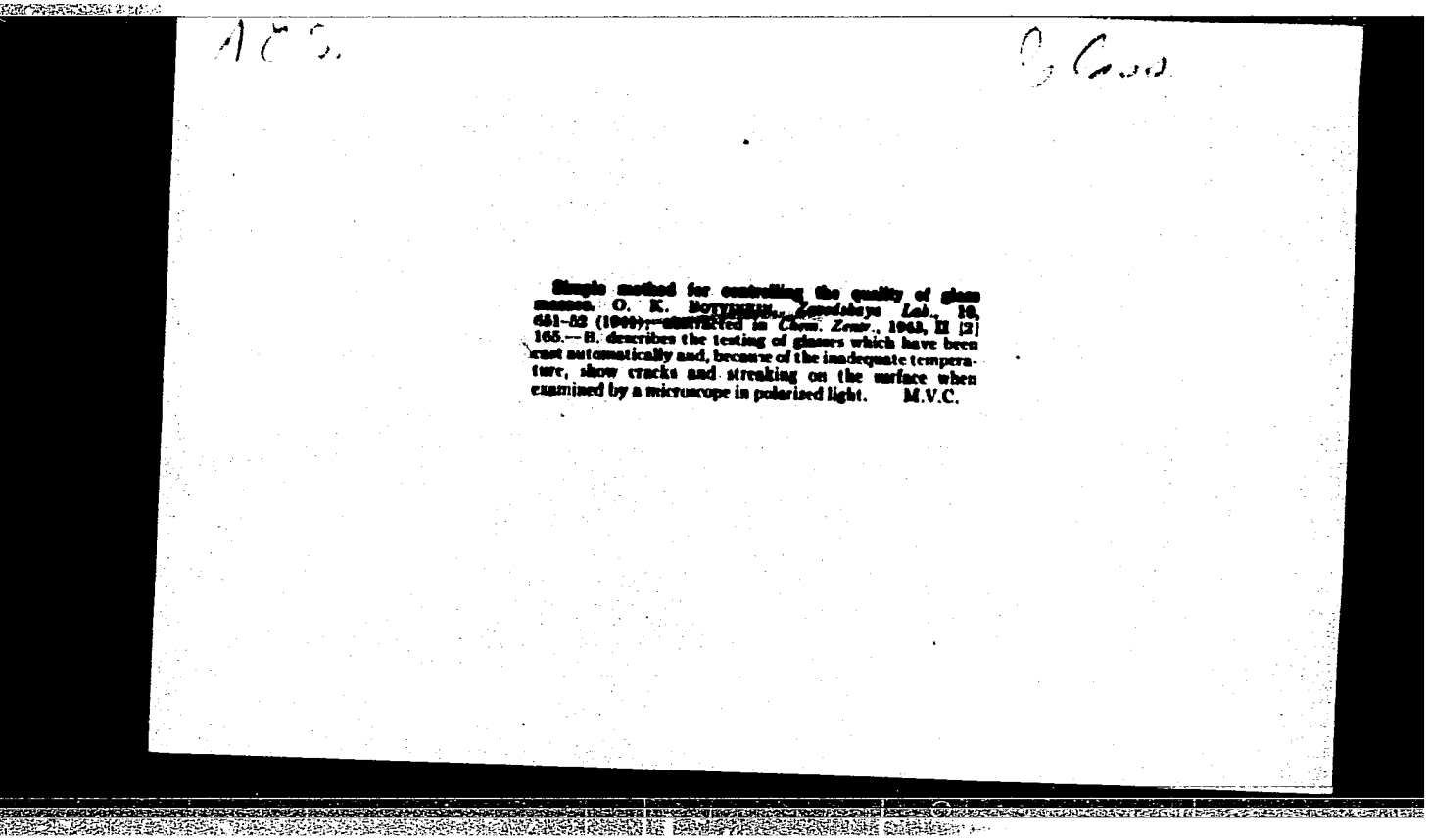
BOTVINKIN, Oleg Konstnatinovich, 1904- Introduction tothe physical chemistry of silicates Moskva, Gos. izd-vo legkoi promyshlennosti, 1938. 283 p.(47-44849)

QD181.S6B6

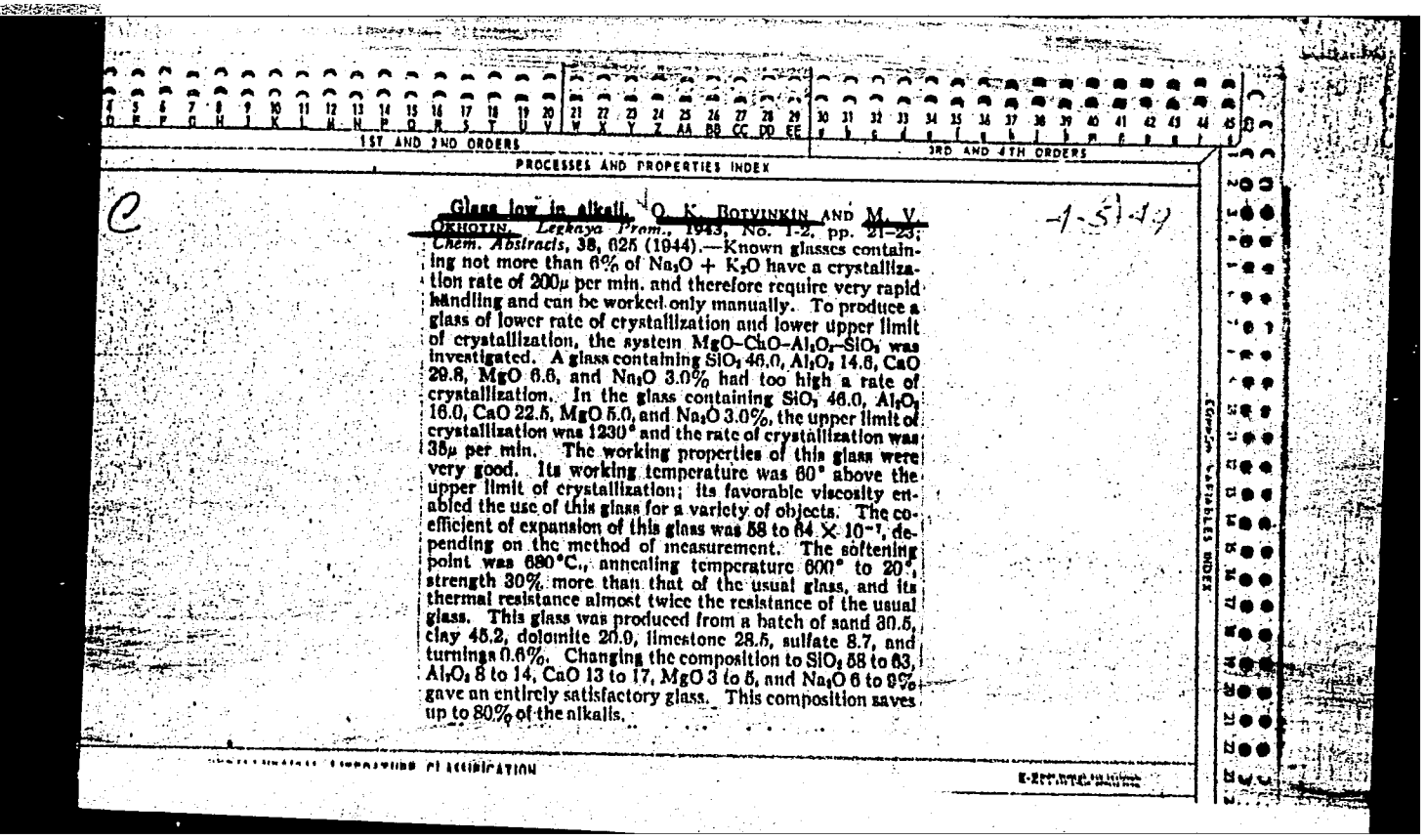


The glass-like state. O. K. Botvinkin. *Bull. acad. sci. U. R. S. S., Sér. phys.* 4, No. 4, 600-3(in English, 603)(1940).—The crystals discovered in glasses are not structural elements, but are a product of devitrification. The aggregates of simple or assocd. mols. composing glass are homogeneous in their chem. compn., the temps. of complete aggregation being different for each type of grouping. The structure of the spatial lattice of aggregates of the mols. is destd. in the transition through the 1st T_g point. In the transition through the following T_g points there takes place only a filling of the cells of the lattice by new aggregates of different chem. compn. Tetrahedral groups (SiO_4) are connected mainly with the internal structure of the silicate mols. and not with the structure of the aggregates (with the exception of the structure of quartz glass). The bonds between the mols. and aggregates of glass are considerably weaker than between atoms in a mol. of the silicates; this points to a different nature of the binding. The anomalous properties of glass are connected not with the processes of growth of the aggregates, but with an increase in their no. Processes of change in the degree of assocn. of the mols. lead to an increase in η, but do not det. the law of change of the properties of glass in the anomalous interval. Eighteen references.

W. R. Hess



Simple method for controlling the quality of glass masses. O. K. Botvinkin. *Zavodskaya Lab.*, 16, 651–52 (1950); abstracted in *Chem. Zentr.*, 1951, II [2] 165.—B. describes the testing of glasses which have been cast automatically and, because of the inadequate temperature, show cracks and streaking on the surface when examined by a microscope in polarized light. M.V.C.



1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

C

-1-5147

Glass low in alkali. O. K. Botvinkin and M. V. Okhotin. *Legkaya Prom.*, 1943, No. 1-2, pp. 21-23; *Chem. Abstracts*, 38, 625 (1944).—Known glasses containing not more than 6% of $Na_2O + K_2O$ have a crystallization rate of 200μ per min. and therefore require very rapid handling and can be worked only manually. To produce a glass of lower rate of crystallization and lower upper limit of crystallization, the system $MgO-CaO-Al_2O_3-SiO_2$ was investigated. A glass containing SiO_2 46.0, Al_2O_3 14.6, CaO 29.8, MgO 6.6, and Na_2O 3.0% had too high a rate of crystallization. In the glass containing SiO_2 46.0, Al_2O_3 16.0, CaO 22.5, MgO 5.0, and Na_2O 3.0%, the upper limit of crystallization was 1230° and the rate of crystallization was 38μ per min. The working properties of this glass were very good. Its working temperature was 60° above the upper limit of crystallization; its favorable viscosity enabled the use of this glass for a variety of objects. The coefficient of expansion of this glass was 58 to 64 × 10^{-7}, depending on the method of measurement. The softening point was 680°C., annealing temperature 600° to 20°, strength 30% more than that of the usual glass, and its thermal resistance almost twice the resistance of the usual glass. This glass was produced from a batch of sand 30.5, clay 45.2, dolomite 20.9, limestone 28.5, sulfate 8.7, and turnings 0.6%. Changing the composition to SiO_2 58 to 63, Al_2O_3 8 to 14, CaO 13 to 17, MgO 3 to 5, and Na_2O 6 to 9% gave an entirely satisfactory glass. This composition saves up to 80% of the alkalis.

CLASSIFICATION

BOTVINKIN, O. K.

Primenie kolloidno-grafitovikh smazok v stekolnoy promyshlenosti (Use of colloidal graphit as a lubricant in the glass industry).

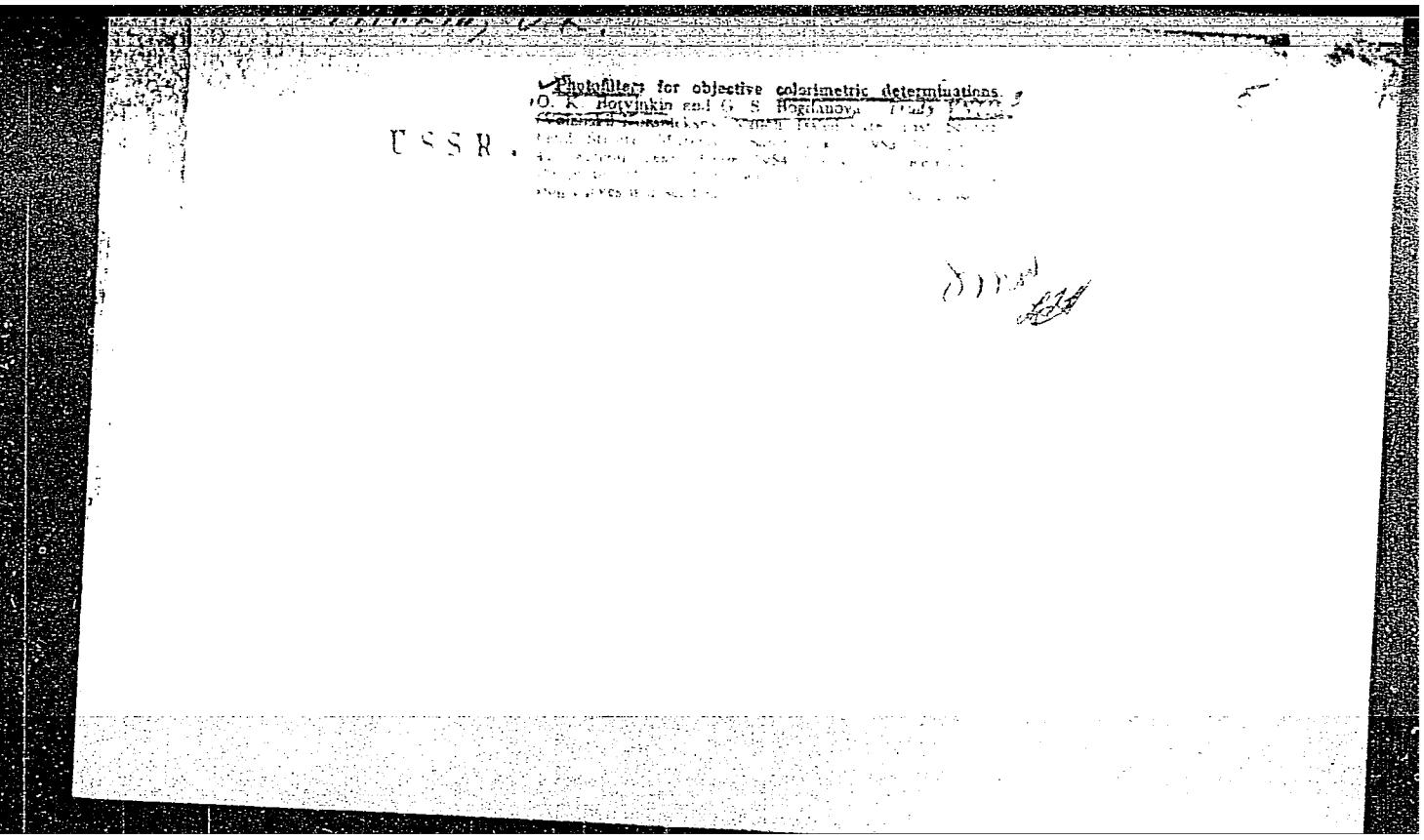
Moscow 1946.

BOTVINKIN, O. K.

4

(3)

Study of wetting and adhesion of fused silicates to solid surfaces. V. T. Marinina and O. K. Botvinkin. *Trudy Vsesoyus. Nauch.-Issledovatel. Inst. Stekla* No. 33, 3-11 (1953); *Referat. Zhur., Khim.* 1953, No. 7259.—This study was carried out with fused silicate and borate glasses, enamel, and enamel base. The solid surfaces used were ceramic, Pt, and Cu. Wetting was detd. at 450-950° by measuring the contact angle. Best wetted were Pt and Cu. Enamel base and enamel wetted best, followed by borate glass, and finally by ordinary glass. The degree of wetting depended on the temp., compn. of the fused material, and the kind of solid surface. The ceramic surface was not wetted by glasses below 950°, while enamel and enamel base started wetting a ceramic surface at 750°. Pt was wetted by glass at 850-900° and by enamel base at 700°. Cu was wetted by glass starting at 850° and by enamel and enamel base at 650°. Cu and Pt had the best adhesion to fused silicates. The temp. of adhesion of ordinary glass to a ceramic surface was 700°, to Pt 650°, and to Cu 545°. The adhesion temp. of borate glass was 690°, 620°, and 515°, resp., while for enamel base it was 600°, 555°, and 500°, resp. M. H.



Photofilters for objective colorimetric determinations.
O. K. Potyushkin and G. S. Bogdanova. (USSR)

USSR.

USSR

Problems of chemical stability of glass. O. K. Botvinkin and B. V. Tarasov. *Stekla i Keram.* 11 [illegible]

Chemical stability was determined with glass [illegible] system Na_2O-SiO_2-ZrO_2 [illegible] by weight loss after boiling and the [illegible] the hydrate film. All the glass [illegible] All oxides of the [illegible] varied [illegible] surface concentration of large [illegible] solutions [illegible] The glass [illegible] destruction [illegible] were [illegible] glass. Tests with vitreous quartz [illegible] dissolves [illegible] loss of solution of quartz glass [illegible] that of other glasses so that aggregates [illegible] protective film. Aggregates of the type [illegible] probably the least stable structural [illegible] type $qNa_2O \cdot pZrO_2$ should be subject to hydrolysis [illegible] Na silicates, with NaOH passing into solution. [illegible] ity of ZrO_2 indicates that H_2ZrO_3 is adsorbed [illegible] surface film. Aggregates of the type [illegible] compose into more simple compounds. The mechanism of destruction of high-Zr glasses proceeds as follows: At first, the easily hydrolyzable compounds are [illegible] $nSiO_2$ and $qNa_2O \cdot pZrO_2$ with NaOH [illegible] into solution; the surface film consisting [illegible] adsorbs H_2ZrO_3 and partly H_2SiO_3 [illegible] rich in difficultly soluble components [illegible] into solution; destruction is then [illegible]

B. Z. K.

USSR

404. Industrial melting of glasses containing zircon.—O. K. BOTVINKIN and B. V. TARASOV (*Glass & Ceramics*, Moscow, 11, No. 7, 18, 1954).—Experiments made to find glasses that could replace mica in water-gauges of steam boilers with a working pressure up to 120 atm. showed that in the system Na_2O–ZrO_2–SiO_2 there is a group of glasses that has very high chemical durability. The present brief article describes experiments on transparent glasses in this group. Suitable compositions are shown on a ternary diagram. In one Russian plant glass containing 21% ZrO_2 is being melted (at 1,500° C., for 35–40 hr.) in glass-pots of 500-l. capacity. (1 fig.)

BUDNIKOV, P.P.; BEREZHNOY, A.S.; BOTVINKIN, O.K.; DAVYDOV, S.S.; GEVORKYAN, Kh.O.; GORYAYNOV, K.E.; KUPRIANOV, V.P.; KITAYGORODSKIY, I.I.; KYKOLEV, V.G.; LAPIN, V.V.; LITVAKOVSKIY, A.A.; MOSKVIN, V.M.; MIRONOV, S.A.; MCHEDLOV-PETROSYAN, O.P.; PEVZNER, R.L.; SKROMTAYEV, B.G.; YUNG, V.N.; YUSHKEVICH, M.O.

Academician D.S.Beliankin; obituary. Zhur.prikl.khim. 27 no.1: 3-4 Ja '54. (MLRA 7:3)

(Beliankin, Dmitrii Stepanovich, 1876-1953)

BOTVINKIN, O.K.; YEVSTROP'YEV, K.S., doktor khimicheskikh nauk, professor, retsenzent; TOROPOV, N.A., doktor tekhn.nauk, professor, retsenzent; MAZURIN, O.V., kandidat khim. nauk, retsenzent; KUKOLEV, G.V., doktor tekhnicheskikh nauk, peofessor, retsenzent; ALKHED, I.Ya., kandidat tekhnicheskikh nauk, redaktor; DEMINA, G.A., redaktor; LYUDKOVSKAYA, N.I., tekhnicheskiy redaktor.

[Physical chemistry of silicates] Fizicheskaia khimiia silikatov. Izd. 2-oe, perer. i dop. Moskva, Gos.izd-vo lit-ry po stroit. materialam, 1955. 285 p. (MLRA (9:5)

1.Kafedra obshchey tekhnologii silikatov Leningradskogo ordena Trudovogo Krasnogo Znameni Tekhnologicheskogo instituta imeni Lensoveta (for Yevstrop'yev, Toropov, Mazurin).
(Silicates)

BOTVINKIN, O. K.

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5159

Author: Botvinkin, O. K.

Institution: Academy of Sciences USSR

Title: Glass Structure

Original Publication: Sb. Stroyeniye stekla, M.-L., AN SSSR, 1955, 26-29

Abstract: It is pointed out that the principal structural elements of the highly viscous state of glass are the individual islets of molecular grcupings, and aggregates, the number and dimensions of which depend upon temperature. On lowering of the temperature there are formed reticulations, frameworks, consisting of molecules of the same type (if there are no solid solutions in the system involved) or having a variable composition, corresponding to solid solutions, if such are known to be present in the crystalline state. The other components of glass are distributed over individual areas in the form of an additional reticulation included within the principal.

Card 1/1

BOTVINKIN, O.K.

AID P - 2908

Subject : USSR/Electricity

Card 1/1 Pub. 26 - 5/32

Authors : Botvinkin, O. K., Dr. Chem. Sci.; G. Ya. Ioffe, Eng.; L. B. Krol', Kand. Tech. Sci.; B. V. Tarasov, Kand. Tech. Sci.

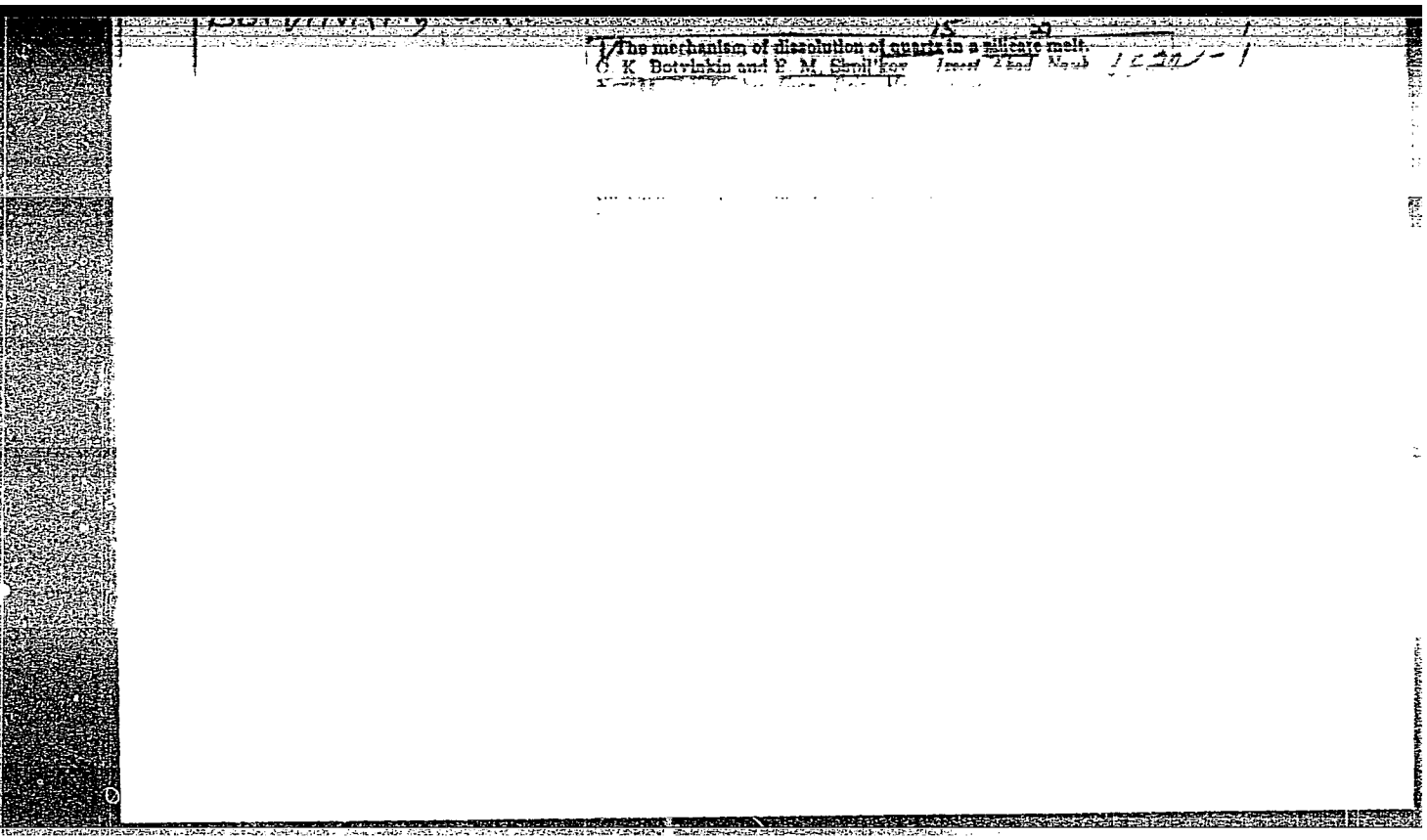
Title : Chemically-resistant glass for peepholes of high pressure boilers

Periodical : Elek.sta., 7, 19-21, Jl 1955

Abstract : The article mentions the inadvisability of using "pyrex" glass and the exorbitant cost of muscovite for peepholes of high pressure boilers. Detailed descriptions of the components and properties of the types of glass designed to withstand temperature and high pressure resulting from the operation of boilers are given. Four diagrams.

Institution : None

Submitted : No date



BOTVINKIN, O.K.

PHASE I BOOK EXPLOITATION 811

Akademiya nauk SSSR

Sbornik posvyashchennyy pamyati Akademika P.P. Lazareva (Collection of Articles in Memory of Academician P.P. Lazarev) Moscow, Izd-vo AN SSSR, 1956. 374 p. 1,600 copies printed.

Resp. Ed.: Shuleykin, V.V., Academician; Editorial Board: Shuleykin, V.V., Academician, Deryagin, B.V., Corresponding Member, Academy of Sciences, USSR, Frank, G.M., Corresponding Member, Academy of Medical Sciences, USSR, Volarovich, M.P., Professor, Yefimov, V.V., Professor, Maslov, N.M., Kuzin, A.M., Professor; Ed. of Publishing House: Kuznetsova, Ye.B.; Tech. Ed.: Shevchenko, G.N.

PURPOSE: This compilation of articles is published in honor of P.P. Lazarev.

COVERAGE: The collection consists of three parts; the first group of articles deals with general physics, the second with biophysics and physiology, the third with geophysics. In the Table of Contents, the date on which the article was received follows each title.

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SECTION II. BIOPHYSICS AND PHYSIOLOGY

SECTION III. GEOPHYSICS

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Card 6/6

BOTVINKIN, OK.

Category : USSR/Atomic and Molecular Physics - Liquids D-8

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6440

Author : Botvinkin, O.K.
Title : On the Inconstancy of Certain Physical Constants in Commercial Glass.

Orig Pub : Sv. posvyashch. pamyati akad. P.P. Lazareva, M., AN SSSR, 1956, 27-29

Abstract : No abstract

Card : 1/1

BOTVINKIN, O. K.

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5188

Author: Tykachinskiy, I. D., Botvinkin, O. K., Buneyeva, L. I., Levina, R. S., Okhotin, M. V., Rogozhin, Yu. V., Syritskaya, Z. M.

Institution: None

Title: Development of Alkali-Free and Low-Alkali Glass Compositions and of the Technology of Their Melting and Fabrication

Original Publication: Steklo i keramika, 1956, No 6, 1-6

Abstract: Presentation of the results of work on the development of boron-free, alkali-free or low-alkali glasses, suitable for mechanized manufacture of mass production articles. Selection of the compositions was based on a four component system SiO_2-Al_2O_3-CaO-MgO, and research dealt primarily with the region of ternary eutectic, of MP 1,222°, having the composition (in % by weight): SiO_2 61.9, Al_2O_3 18.5, CaO 10.2 and MgO 9.4. To facilitate melting additions of CaF_2, B_2O_3, Na_2O,

Card 1/2 Vsesoyuznyy nauchno-issledovatel' [illegible] inst

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5188

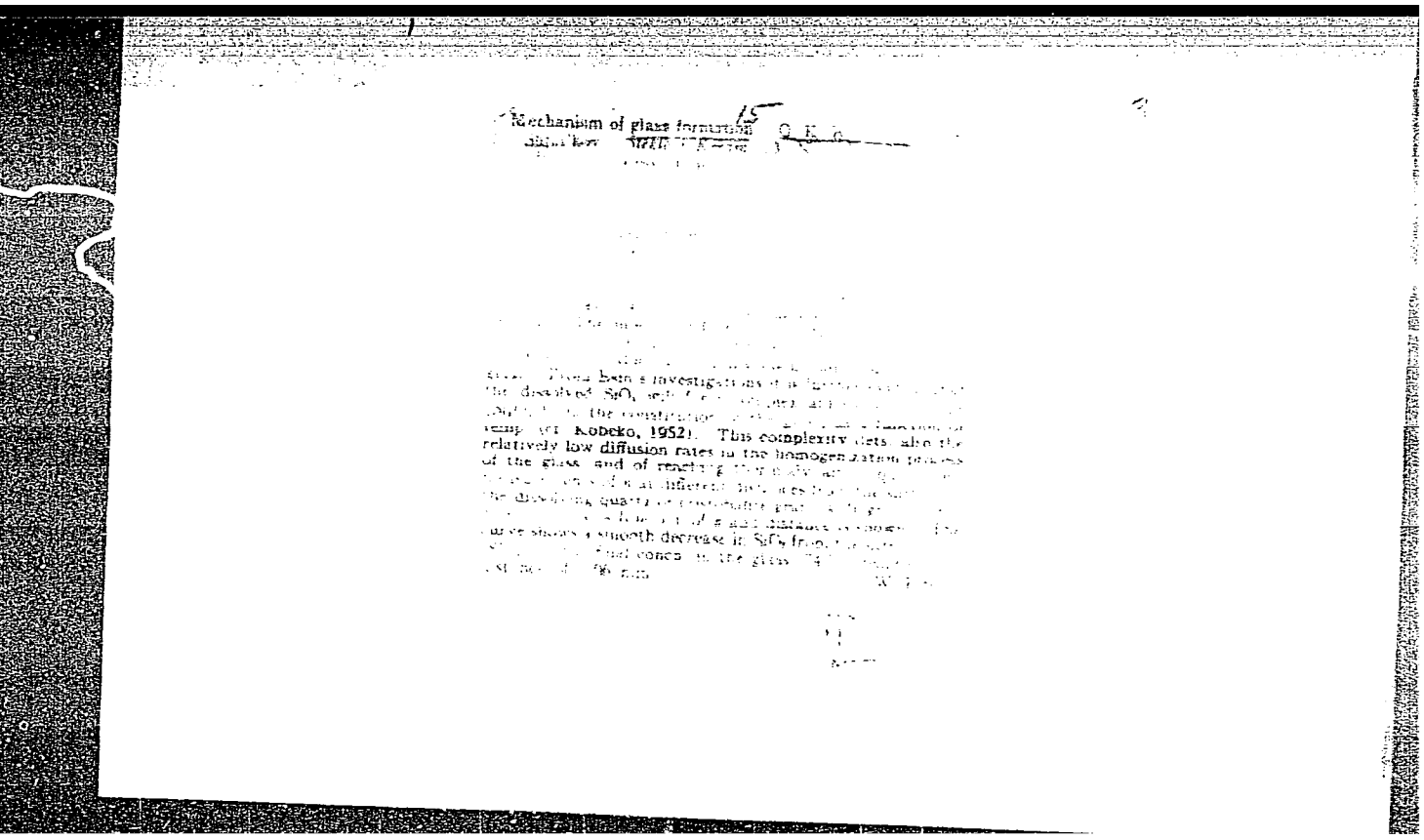
Abstract: P_2O_5 were used. CaF_2 was found to be most effective. Elimination of silica crust at the surface of the glass melt was effected by incorporation of 1% CaO as calcium sulfate. A series of glasses have been developed in which the sum of alkaline-earth oxides is constant, and the proportions of MgO and CaO approximate those of dolomite. As a result of studies of crystallization and viscosity a series of glass compositions are recommended. One of them (glass No 13) contains (in % by weight): SiO_2 61.9, Al_2O_3 18.5, CaO 15.4, MgO 4.2, F' 4 (in excess of 100); it is characterized by the following properties: coefficient of linear expansion 43-45 $\cdot 10^{-7}$, thermal conductivity coefficient (at 70-350°) 0.75-0.77 kcal/m degree hour, thermal capacity (at 25-360°) 0.472-0.208 kcal/kg degree, Young modulus 7,350-7,500 kg/mm^2, specific gravity 2.6 g/cm^3, flexural strength 620 kg/cm^2, microhardness 935-975 kg/mm^2. The investigated glasses show high electric insulating properties. They can be melted in pot and tank furnaces at 1,480-1,510° and fabricated by various mechanized procedures in the mass production of various kinds of glass articles (tubes, insulators, parts of machines and apparatus, glass fiber).

Card 2/2

BOTVINKIN, O.K.; SHPIL'KOV, Ye.M.

Mechanics of the diffusion of quarts in silicatemelts. Izv.AN Kazakh.SSR.Ser.gor.dela, met., stroi. i stroimat. no.10:46-54 '56. (MIRA 10:1)

(Glass manufacture) (Quarts)
(Diffusion)



Mechanism of glass formation

relatively low diffusion rates in the homogen

BOTVINKIN, O.K.

KLYUKOVSKIY, Georgiy Ippolitovich; MANUYLOV, Lev Aleksandrovich; BOTVINKIN, O.K., doktor tekhn.nauk, prof., red.; FEDOROVA, T.N., red.; GILENSON, P.G., tekhn.red.

[Physical chemistry and the chemistry of silica] Fizicheskaia khimiia i khimiia kremniia. Izd.2-oe, perer.i dop. Pod red. O.K.Botvinkina. Moskva, Gos.izd-vo lit-ry po stroit.materialam, 1957. 263 p. (MIRA 11:1)

(Silica) (Silicates)

BOTVINKIN, O.K.; TARASOV, B.V.; SESOROVA, V.N.

Manufacturing transition glass seals. Prib. i tekh. eksp. no.1:119-121 Ja-F '57. (MLRA 10:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut stekla.
(Glass-metal sealing)

BOTVINKIN, O.K.

BOTVINKIN, O.K.; SHPIL'KOV, Ye.M.

Kinetics of glass formation in a three-component system Na_2O - CaO - SiO_2. Izv. AN Kazakh. SSR. Ser. gor. dela, met., stroi. i stroimat. no.3:86-102 '57. (MIRA 10:11)
(Glass manufacture--Chemistry)

BOTVINKIN, O.K.; TARASOV, B.V.; SESOROVA, V.N.

Manufacturing transition glasses and vacuum-sealing junctions.
Biul.tekh.-ekon.inform. no.9:39-40 '58. (MIRA 11:10)
(Glass-metal sealing)

15 (2)

AUTHORS: Botvinkin, O. K., Ananich, N. I. SOV/72-59-9-2/16

TITLE: Anomalous Double Refraction of Rays and the Glass Structure

PERIODICAL: Steklo i keramika, 1959, Nr 9, pp 6-11 (USSR)

ABSTRACT: Various scientists, among them V. L. Indenbom (Ref 1) and G. O. Bagdyk'yants (note 4), are not in agreement about the cause underlying the development of the anomalous double refraction of rays. To clarify the substance of this phenomenon, the authors of this paper carried out research work to establish the temperature influence on this phenomenon, using a polarimeter, the scheme of which is described in the paper by Indenbom and Ananich (note 7). On the basis of the curves for the dependence of the anomalous double refraction of rays on temperature, the authors endeavored to find an explanation of the causes for the development of micro-stresses in the glass types, and to characterize the structure of these glass types in connection therewith. They quote here the papers by V. V. Tarasov (Refs 8 and 9). Furthermore, 7 figures are given, showing the curves for the change in the extent of the anomalous double refraction of rays of various types of glass during their heating and cooling. The paper by O. K. Botvinkin (note 10) is mentioned in

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this connection. It is stated in conclusion that the anomalous double refraction of rays in inorganic types of glass is not connected with the orientation of the crystallites, but with that of the chains and other aggregates. There are 7 figures and 10 references, 7 of which are Soviet.

KISELEVA, Ye.V.; KARNETNIKOV, G.S.; KUDRYASHOV, I.V.; BOTVINKIN, O.K., doktor khim.nauk, retsenzent; MAKOLKIN, I.A., doktor tekhn.nauk, retsenzent; MISHCHENKO, K.P., doktor khim.nauk, retsenzent; GRYAZNOV, V.M., red.; REZUKHINA, T.N., red.; ZAZUL'SKAYA, V.F., tekhn.red.

[Collection of illustrated physical chemistry problems and exercises] Sbornik primerov i zadach po fizicheskoi khimii. Moskva, Gos. nauchno-tekhn.izd-vo khim.lit-ry, 1960. 264 p. (MIRA 13:7)
(Chemistry, Physical and theoretical--Problems, exercises, etc.)

BOTVINKIN, O.K.

"Diagrams of glass systems" by M.A.Bezborodov and others. Reviewed by O.K.Botvinkin. Stek.i ker. 17 no.7:48 Jl '60. (MIRA 13:7)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR.
(Glass manufacture--Chemistry) (Bezborodov, M.A.)

BOTVINKIN, O.K.

15(2)

AUTHOR: None Given

SOV/72-59-5-1/23

TITLE: Glass Science at the VIII Mendeleyev Congress (Nauka o stekle na VIII Mendeleyevskom s"yezde)

PERIODICAL: Steklo i keramika, 1959, Nr 5, pp 1-4 (USSR)

ABSTRACT: In the beginning a proclamation of the TsK KPSS to the personnel of the building material industries for a qualitative and quantitative increase of production is mentioned. The Congress took place in Moscow in the second half of March of the current year and was devoted to the 125th anniversary of the great scholar's birthday. Outstanding chemists of the Soviet Union and the People's Democracies attended the Congress. The principal problems of the development of chemistry were discussed at the plenary meetings and the meetings of the 18 Congress sections. Professor I. I. Kitaygorodskiy opened the meetings of the sub-section for glass and gave a survey of the stages of development of Soviet glass production as well as of a number of promising tasks in the field of glass technology. Moreover, the following lectures were held: Doctor Korani (People's Republic of Hungary) investigated the structure of the top-layers of glass;

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A. I. Avgustinnik (LTI imeni Lensovet) discussed the formation of a finely disperse crystalline phase from the glass-like phase; V. V. Vargin and G. O. Karapetyan (GOI) reported on absorption spectra, luminiscence, and photochemical properties of cerium-glass types; A. G. Vlasov (GOI) reported on the quantitative reciprocal relations between ordered and disordered glass phases; Ye. A. Poray-Koshits, Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry of the AS USSR) discussed the reasons for the disagreement on the problem of the structure of glass-like substances; Professor O. K. Botvinkin, N. I. Amanich, and M. L. Mironova, Institut stekla (Glass Institute) reported on the Investigation of the Glass Structure by the Method of Thermal Analysis and Optical Polarization; Ye. V. Podushko (GOI) discussed the new method of electric glass melting and the melting of silicates by means of high-frequency current; Yu. G. Shteynberg reported on strontium-magnesium glasses without lead and boron for faience and majolica which have been developed in the Gosudarstvennyy nauchno-issledovatel'skiy keramicheskiy institut (State Scientific Research Institute of Ceramics); L. S. Yastrebova, and V. E. Kolchanov (GOI) discussed the role played by the

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surface protection film in the destruction of silicate glasses; G. I. Veynberg (GOI) discussed the coloring characteristics and the technology of phosphate glasses; O. V. Mazurin (LTI) reported on the mobility of sodium ions in glass types of the system Na_2O-RO-SiO_2; Z. A. Noseva (NII Stroykeramika) discussed the process of subduing the glasses by lead oxide and zirconium; L. G. Mel'nichenko, Khar'kovskiy politekhnicheskiy institut (Khar'kov Polytechnic Institute) reported on silicate formation and sintering processes in the briquetted glass layer; K. M. Yevstrop'yev investigated various types of glass; N. N. Semenov (Glass Institute) reported on the determination of impurities in silica by spectroscopic analysis; G. S. Bogdanova, and Ye. M. Orlova (Glass Institute) reported on types of electrode glass which has been devised by them. Yu. V. Rogoshin (Glass Institute) discussed the kinetics of the formation of crystallization centers in photo-sensitive types of glass; Z. M. Syritskaya (Glass Institute) discussed the results of the investigation of the tendency of phosphatic systems towards glass formation; L. A. Grechanik, N. V. Petrovykh, and V. G. Karpechenko (NIIES) reported on the investigation of types of semiconducting oxide glass on the basis of V_2O_5; N. V. Solomin, L. A. Grechanik, I. V. Shpakova, and Ye. A. Faynberg (NIIES) discussed the production of conductive films on types of glass which contain components easily to be regenerated.

BOTVINKIN, O. K.

PHASE I BOOK EXPLOITATION SOV/5035

Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed. (Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, M.A. Bezborodov, O.K. Botvinkin, V.V.Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Porny-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bochever.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanism of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 300 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were K.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gastev, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, S.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shatilov, N.T. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Degtyareva, G.V. Byurganovskaya, A.A. Kalenov, M.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ya.A. Kuznetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds, AS USSR), Gosudarstvennyy institut stekla (State Institute for Glass), Gosudarstvennyy institut steklovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotekhnicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-technicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk), Leningradskiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tekhnologicheskiy institut (Moscow Institute of Chemical Technology), Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensovet), Belorusskiy politekhnicheskiy institut Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include [illegible] to organize a Center for the purpose of coordinating the research [illegible], to publish a new periodical under the title "Fizika i khimiya stekla" ([illegible] and Chemistry of Glass), and to join the International Committee on [illegible]. The Conference thanks A.A. Lebedev, Academician, Professor, and Chairman of the Organization of Committee; Ye.A. Porny-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board thanks G.M. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dubrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

Relation Between the Structure and Properties of Glasses

Nature of the Chemical Bond and Structure of Glasses

"Crystallochemistry of Glass"

FUSED SILICA. MECHANISM OF VITRIFICATION

Fused Silica

Mechanism of Vitrification

BOTVINKIN, O.K.

AUTHOR: Syritskaya, Z. M.

S/072/60/000/03/021/023
B003/B008

TITLE: 3rd All-Union Conference on the Vitreous State

PERIODICAL: Steklo i keramika, 1960, Nr 3, pp 43-46 (USSR)

ABSTRACT: The 3rd All-Union Conference on the Vitreous State was held in Leningrad at the end of 1959. It was organized by the Institut khimii silikatov AN SSSR (Institute of the Chemistry of Silicates AS USSR), Vsesoyuznoye khimicheskoye obshchestvo imeni D. I. Mendeleyeva (All-Union Chemical Society imeni D. I. Mendeleyev) and Gosudarstvennyy opticheskiy institut imeni S. I. Vavilova (State Optical Institute imeni S. I. Vavilov). More than 100 reports on the structure of glass, investigation methods of the vitreous state, the mechanism of vitrification and physicochemical and technical properties of glasses were delivered. The Conference was opened by Academician A. A. Lebedev. Fundamental investigation methods and results concerning the glass structure were discussed at the 1st meeting. Academician A. A. Lebedev reported on possibilities and results of optical methods, Ye. A. Poray-Koshits on the diffraction method, K. S. Yevstrop'yev on general problems concerning structure and properties of glasses. The 2nd meeting produced 5 reports on the problem of the vitreous state: R. L. Myuller, "Chemical Peculiarities of Polymeric Vitreous Materials and the

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Nature of Vitrification"; N. A. Goryunova and B. T. Kolomiyets, "On the Problems of Conformities of the Vitrification"; V. V. Tarasov, "Glass as a Polymer"; A. N. Dauval'ter, "Theory of Glass Structure"; A. G. Vlasov, "Natural Oscillations of the Glass Lattice". The 3rd meeting produced 9 reports on investigation results of silicate melts and on problems of the mechanism of vitrification: A. I. Avgustinik, "On the Problem of the Formation of the Crystalline Phase From the Silicate Melt"; O. K. Botvinkin, "Process of Vitrification and the Structure of Glass"; B. M. Leninskikh, O. A. Yesin and V. I. Musikhin, "On the Structure of Melts"; I. T. Sryvalkin and O. A. Yesin, "Thermodynamic Properties of the Silicate Systems $FeO - CaO - SiO_2$ and $CaO - Al_2O_3 - SiO_2$"; G. M. Bartenev, "Mechanical and Structural Vitrification"; M. V. Vol'kenshteyn, "Mechanism of Vitrification". At the 4th meeting, 13 reports dealt with problems of the glass structure and optical investigation methods: V. A. Florinskaya, "Infrared Reflection Spectra of Sodium Silicate Glasses and Their Relations to the Structure"; Ya. S. Bobovich and T. P. Tulub, "Smekal-Raman Dispersion of Light and the Structure of Some Silicate Glasses"; V. A. Kolesova, "Investigation of the Vibrational Spectra of Aluminosilicate Glasses"; N. N. Sobolev reported on the work of the Fizicheskiy Institut AN SSSR (Institute of Physics AS USSR) with

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glasses from one component, with the help of infrared spectrophotometry and the Smekal-Raman dispersion; T. A. Sidorov reported on the molecular structure and the properties of the crystalline quartz; S. M. Brekhovskikh and V. P. Cheremisinov reported on structural investigations of lead- and bismuthborate glasses with the aid of infrared spectroscopy; A. G. Vlasov, "The Quantitative Relation of the Orderly and Irregular Phase in Glass"; G. O. Bagdyk'yants and A. G. Alekseyev, "Electronographic Investigation of the Structure of Glasses"; N. A. Voyshvillo, "On the Structure of a Sodium-boron-silicate Glass Submitted to Enduring Thermal Treatment"; N. S. Andreyev, V. I. Aver'yanov, N. A. Voyshvillo, "Structural Interpretation of the Anormal Dispersion of the Visible Light in Sodium-boron-silicate Glasses". At the 5th meeting, 9 reports dealt with the investigation results of sodium-boron-silicate glasses. A. A. Appen and Gan' Fu-Si, "Boron and Alumoboron Anomaly of the Properties of Silicate Glasses"; Ye. I. Galant, "On the Coordination Numbers of Aluminum and Boron in Some Glasses"; S. P. Zhdanov reported on structural changes in boron-silicate glasses; Ye. A. Poray-Koshits and S. P. Zhdanov reported on some controversial problems concerning the structure of boron-silicate glasses and their porous products; Ye. A. Poray-Koshits and N. S. Andreyev, "Submicroscopic Inhomogeneities in the Structure of Complex Glasses". The 15 reports at

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(23)

BARBARINA, T.M.;SUKHOV, M.P.; SHELUDYAKOV, N.A.[deceased];
SHKOL'NIKOV, Ya.A., kand. tekhn. nauk, retsenzent;
BOTVINKIN, O.K., prof. doktor khim. nauk, nauchnyy
red.; GOMOZOVA, N.A., red. izd-va; GILENSON, P.G., tekhn.
red.

[Fiber-glass building materials] Steklovoloknistye stroitel'-
nye materialy. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i
stroit. materialam, 1961. 167 p. (MIRA 15:4)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury
SSSR (for Botvinkin).
(Building materials) (Glass fibers)

S/081/62/000/024/070/073
B166/B186

AUTHORS: Botvinkin, O. K., Cherevkova, Ye. V.

TITLE: Procedure for electromotive force determination and the structure of melts in the Pb - SiO_2 system

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24, 1962, 586, abstract 24K353 (Steklo Byul. Gos. n.-i. in-ta stekla, no. 4 (113), 1961, 1 - 5)

TEXT: The intermediate electrode was isolated in a concentration cell made from corundum crucibles; this makes it possible to construct concentration cells with transfer for studying the e.m.f. of various systems at high temperatures with a view to calculating their thermodynamic properties. Electromotive forces were measured as a function of composition for the PbO - SiO_2 system at 925°C. Stable compounds $2PbO \cdot SiO_2$ and $PbO \cdot SiO_2$ exist in the melt. The activities of Pb ions with different PbO concentrations were computed from the e.m.f. values. [Abstracter's note: Complete translation.]

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S/081/63/000/002/044/088
B156/B144

AUTHORS: Botvinkin, O. K., Berezhnaya, I. N.

TITLE: γ-ray coloration of quartz glass

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 2, 1963, 375, abstract 2M68 (Steklo. Byul. Gos. n.-i. in-ta stekla, no. 2 (111), 1961, 15-20)

TEXT: The effects of various impurities in quartz on its coloring under radiation were investigated, and the effects of the conditions under which quartz glass is melted were determined. The irradiation was carried out in a K-20000 (K-20000) apparatus for radiation chemistry research. The integral dose used was $5.6 \cdot 10^6$ r. The integral dose was increased to $7.5 \cdot 10^8$ r in the case of specimens which the first dose did not color. A number of specimens were irradiated in an atomic reactor (integral dose $2 \cdot 10^9$ r). The effects of the irradiation were assessed from the changes in the spectral characteristics of the specimens investigated, determined with an SF-4 (SF-4) spectrophotometer in the

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γ-ray coloration of quartz glass

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230-110 mμ range. The spectral characteristics are given. The quartz glass was melted in a moderately oxidizing atmosphere, in air, and in the flame from a torch burning on natural gas and oxygen. The effects of the conditions under which the quartz glass was produced on the extent to which irradiation colored it were also investigated with specimens melted in a oxy-hydrogen flame and in vacuum-press furnaces. It was established that the result of impurities being present in quartz is that irradiation colors it. The intensity of coloring and the locations of the absorption bands (AB) depend on the type of impurity and its concentration. Increase in the contents of Al, Ge, Fe or Ta oxides brings about the formation of .3 with a maximum of ~ 400 mμ. It is suggested that, by analogy with crystalline quartz, the absorption in this range is caused by centres of coloration which form when the Si^{4+} in the framework of the glass is replaced by Fe^{3+}, Al^{3+}, Ge^{4+}, etc. The characteristic AB formed when quartz glass is irradiated are in the 300 and 550 mμ range. AB in the 300 mμ range form in every case. The formation of AB in the 550 mμ range is promoted if the melting conditions are of a reducing nature. It is suggested that the AB in the 300 mμ range are due to the presence of unbound oxygen atoms, and that the AB in the 550 mμ range are due to vacancies in unbound oxygen atoms. A hypothesis regarding the formation

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γ-ray coloration of quartz glass

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of the AB is proposed on the basis of the theory for the development of coloration centres and the quantum theory for the state of electrons in solid bodies. [Abstracter's note: Complete translation.]

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15.8114

S/072/61/000/001/001/005
B021/B054

AUTHORS: Botvinkin, O. K., Professor, Vorob'yeva, O. V., Portnova, V.A.

TITLE: Insulation of Conductive Glass Coatings

PERIODICAL: Steklo i keramika, 1961, No. 1, pp. 16-18

TEXT: The Institut stekla (Glass Institute) made an investigation to find transparent varnishes capable of insulating glasses with conductive surface. Among organic compounds, polyamide resin and 124-ВЭИ (124-VEI) varnish gave the best results. Polyamide films, however, have a poor mechanical stability. From among a great number of organosilicon compounds, the authors tested varnishes K-47 and K-60; K-47 was found to have insufficient mechanical stability, and is therefore not recommendable as an insulating material. Upon recommendation by the nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry), the organometallic compound КБС (KBS) and the organosilicon resins П-4 (P-4), П-5 (P-5), П-20 (P-20), and П-40 (P-40) were added to the varnish, which, however, did not increase the mechanical stability of K-47. K-60 varnish shows good insulating properties. A table

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Insulation of Conductive Glass Coatings S/072/61/000/001/001/005
B021/B054

compares the hardness characteristics of films of the two best varnishes K-60 and 124-VEI on glasses with a semiconductor tin-dioxide layer. Films of K-60 varnish are transparent, heat-resistant up to 200°C, water-repellant, adhere well to glass, but have a relatively low hardness value. Films of 124-VEI varnish are very hard, heat-resistant, and water-repellant. Because of their color they can only be used in cases where a high transparency is not required. There is 1 table.

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BOTVINKIN, O. K.

"Orientational Effect and Birefringence in Sodium Borosilicate Glasses."

report presented at the Sixth International Congress on Glass, 8-14 Jul 62, Wash., D.C.

24.7700 (1160, 1164, 1385)

32368
S/072/62/000/001/001/003
B105/B110

AUTHORS: Botvinkin, O. K., Doctor of Chemical Sciences, Professor, Vorob'yeva, O. V.

TITLE: Effect of γ-irradiation on some properties of current-conducting films

PERIODICAL: Steklo i keramika, no. 1, 1962, 4

TEXT: On the assumption that new structural defects develop owing to γ-irradiation of metallic oxide films, which increases their total conductivity, the effect of γ-irradiation on the electrical conductivity of semiconductor films was investigated. 4 mm thick glass specimens of the composition ВВС (VVS) were used for this purpose. The glass was covered with a 0.5 - 0.7μ thick semiconductor film of tin dioxide which contained activating admixtures of antimony. The film was applied onto the specimens by spraying alcoholic solutions of tin tetrachloride at 640°C. The surface impedance of these layers was 60 - 100 ohms per unit area. The films were colorless and were exposed to γ-irradiation (dose $5.6 \cdot 10^5$ r), with the specific conductivity of the films not changing. X-ray examinations of the

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S/072/62/000/001/001/003
B105/B110

Effect of γ-irradiation on...

films in the system SnO_2 - In_2O_3 showed that the conductivity was chiefly destined by the crystal structure of the coating. If the structure of the film is comparable with the glass structure, its conductivity is greatly reduced. Conclusion: The γ-irradiation has no effect on the change of electrical properties of films. Experiments showed that the semiconductor film of tin dioxide may be used as a coating for parts of apparatus and devices exposed to γ-irradiation. The electrical parameters do not change.

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S/072/62/000/010/001/001
B101/B186

AUTHORS: Ananich, N. I., Engineer, Botvinkin, O. K., Professor, Corresponding Member Academy of Construction and Architecture USSR

TITLE: Orientation effect and form birefringence in sodium borosilicate glasses

PERIODICAL: Steklo i keramika, no. 10, 1962, 10 - 14

TEXT: The occurrence of positive and negative anomalous birefringence above the vitrification temperature when SiO_2 - B_2O_3 - Na_2O glass rods are cooled and stretched simultaneously has already been reported ("Steklo", Informatsionnyy byulleten' Instituta stekla, 1958, no. 2; Steklo i keramika, 1959, no. 9). In the present paper this effect was studied in glass rods containing 70% SiO_2, 23% B_2O_3, and 7% Na_2O, a composition which tends to demix. Glasses with a similar composition showed the same behavior. According to the conditions of stretching (temperature, load, rate of cooling), both negative and positive birefringence was observed in similar compositions. Maximum negative

birefringence occurred when the glasses were heated to 700°C, and the negative birefringence increased further when they were cooled. Some samples showed no birefringence until they were heated, whereupon negative birefringence was observed and this was increased by subsequent cooling. Hence it was concluded that in a cold state, two equal but opposite birefringences arise. As sodium borosilicate glasses which tend to demix are assumed to consist of silica skeletons penetrating each other and of the lower-melting sodium - boron component, the latter was leached out and replaced by liquids in the porous glass. When the liquid had the same refractive index as the sodium - boron component (n_D = 1.504), birefringence did not occur. Only negative form birefringence, caused by stretching of the silica skeleton, was observed when the liquid and the sodium - boron component had different values of n_D. Positive birefringence, which has also been observed in boric anhydrides, is due to an orientation of the structural elements of the sodium - boron component. Anomalous birefringence in microheterogeneous glasses is caused by the orientation effect of the component with the lower vitrification temperature and by form birefringence. The birefringence of glasses with a distinct chain structure depends only on the orientation of the structural elements. There are 9 figures.

Orientation effect and form... S/072/62/000/010/001/001
B101/B186

The English-language reference is: M. Goldstein, T. Davies, J. Am. Cer. Soc., 1955, v. 38, no. 7, pp. 222 - 226.

ASSOCIATION: Institut stekla (Institute of Glass)

Card 3/3

BOTVINKIN, O.K., prof.

Sixth international congress on glass. Stek.i ker. 19 no.11: 45-47 N '62. (MIRA 15:12)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR.

(Glass—Congresses)

BOTVINKIN, O.K., doktor khim. nauk; DENISENKO, O.N., inzh.

Increasing the mechanical strength and the heat-resistance of glass by means of ion exchange. Stek. i ker. 20 no.10:1-3 O '63. (MIRA 16:10)

1. Vesoyuznyy nauchno-issledovatel'skiy institut stekla.
(Glass manufacture) (Ion exchange)

L 13571-66 EWT(m)/EWP(e)/EWP(b) WH

ACC NR: AR6000263 UR/0081/65/000/014/B075/B075

SOURCE: Ref. zh. Khimiya, Abs. 14B492

AUTHOR: Botvinkin, O.K.; Demichev, S.A.

TITLE: Investigating some properties of glass in the Na_2O-ZrO_2-SiO_2 system. Thermal expansion of glass and its dependence on the composition

CITED SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2(123), 1964, 7-15

TOPIC TAGS: glass, glass property, silicate glass, thermal expansion

TRANSLATION: The addition of ZrO_2 to silicate glass at the expense of silica or alkalies increases the softening temperature of glass. At the same time, the T_g temperature also increases. Because the linear expansion in glass is determined basically by its alkali content, the thermal expansion coefficient increases when SiO_2 is substituted with ZrO_2. The substitution of Na_2O with ZrO_2 results in a decrease in the thermal expansion coefficient. The linear expansion coefficient in the glasses investigated increases by substitution of SiO_2 with Na_2O, despite the presence of ZrO_2 into silicate glass a Si— O —Zr bond is formed. This indicates that Zr takes part in creating the glass lattice. See report 1 in abstract 14B491.

SUB CODE: 07

jw

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L 11866-66 EWT(m)/EWP(e)/EWP(b) GS/WH

ACC NR: AT6000477 SOURCE CODE: UR/0000/65/000/000/0119/0121

AUTHOR: Ananich, N. I.; Botvinkin, O. K.

ORG: None

TITLE: Oriented structure of inorganic glasses

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya. Leningrad, Izd-vo Nauka, 1965, 119-121

TOPIC TAGS: thermal expansion, silicate glass, borate glass, double refraction, glass property

ABSTRACT: The thermal expansion of the glasses DV-1, 3S-9, "Ionex", an experimental three-component glass (7% Na_2O, 23% B_2O_3, 70% SiO_2), and vitreous boric anhydride was studied. The samples had different structural birefringences. Changes in the character of the curve representing the thermal expansion of glasses having structural birefringence indicated that during heating, the structural elements (chains, aggregates) stretched in a certain direction contract and become disoriented, causing an irreversible contraction of the sample. A confirmation of the tendency of vitreous boric anhydride to become oriented is given by the difference observed in the photoelastic constants of isotropic and birefringent samples. Another such confirmation is provided by electron-microscopic data. In the authors' view, the phenomenon of orientation of the structural elements in inorganic glasses and

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L 11866-66

ACC NR: AT6000477

organic polymers is similar in character; for this reason, the study of orientation is of major importance for the development and refinement of concepts of the polymeric structure of inorganic glasses. The presence of birefringence in the glasses studied is another argument in favor of the concept that sodium borosilicate and other glasses have a microheterogeneous structure. Orig. art. has: 2 figures.

SUB CODE: 11, 20 / SUBM DATE: 22May65 / ORIG REF: 005 / OTH REF: 001

jw

Card 2/2

L 39672-66 EWT(m)/EWP(e) WW/GD-2

ACC NR: AR6000262 SOURCE CODE: UR/0081/65/000/014/B075/B075

AUTHOR: Botvinkin, O. K.; Demichev, S. A.

TITLE: Study of some properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 1. Effect of the glass composition on the refractive index and density.

SOURCE: Ref. zh. Khimiya, Abs. 14B491

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2 (123), 1964, 1-7

TOPIC TAGS: glass, glass property, zirconium, zirconium compound, refractive index, optic density

ABSTRACT: The refractive indexes and densities (d) of Na_2O-ZrO_2-SiO_2 system glasses were measured. It was established that ZrO_2 in glass in an amount up to 22.5% increases the refractory index, and its relationship to the composition of the investigated glasses is linear. The density of glasses with the same amount of ZrO_2 present increases. Based on the data obtained for density it was found that the relationship between the composition of glass is complex and can be shown by curves which comply with the equation d=klgP, where 'k' is the angle

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L 39672-66

ACC NR: AR6000262

coefficient, P the percentage of oxide content. By this study of the refractive index and calculations it was established that the ZrO_2 structural coefficient is equal numerically to its molecular weight. Based on the experiments it is assumed that ZrO_2 is included in the silicon-oxygen framework. Author's summary

SUB CODE: 11/ SUBM DATE: 25Jul65

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L 39669-66 EWT(m)/EWP(e) WH/GD-2

ACC NR: AR6000264 SOURCE CODE: UR/0081/65/000/014/B075/B075

AUTHOR: Botvinkin, O. K.; Demichev, S. A.

TITLE: Study of some properties of glass in the Na_2O-ZrO_2-SiO_2 system. Report 3. Microhardness and the surface energy of glass

SOURCE: Ref. zh. Khimiya, Abs. 14B493

REF SOURCE: Steklo Inform. materialy Gos. n.-i. in-ta stekla, no. 2 (123), 1964, 15-21

TOPIC TAGS: glass, glass property, zirconium, silicon, toughness, hardness, crystal lattice

ABSTRACT: The introduction of ZrO_2 into glass increases its microhardness. Na_2O in Zr-glasses decreases its microhardness. The coefficient of the abradability of Na_2O-ZrO_2-SiO_2 - system glasses was determined, and the surface energy of these glasses calculated. It was shown that the addition of ZrO_2 results in toughening of the glass crystalline lattice. Report 2, see abstract 14B492. Author's summary.

SUB CODE: 11/ SUBM DATE: 25Jul65

Card 1/1

L 39670-66 EWT(m)/EWP(e) WH/GD-2

ACC NR: AR6000265 SOURCE CODE: UR/0081/65/000/014/B075/B075

AUTHOR: Botvinkin, O. K.; Krogius, Ye. A.; Demichev, S. A.; Vlasov, V. A.

TITLE: Study of some properties of glass in the Na_2O-ZrO_2-SiO_2 system. Report 4. Reflection spectra in the infrared region

SOURCE: Ref. zh. Khimiya, Abs. 14B494

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2 (123), 1964, 22-27

TOPIC TAGS: glass, glass property, zirconium, silicon, depolymerization, crystal lattice, IR spectrum

ABSTRACT: The IR reflection spectra in the region 700-130cm^{-1} of 3 series of glass, corresponding to the general formulas: yNa_2O., $xZrO_2(85-x)$ SiO_2; $xNa_2O(32.5-x)$ ZrO_2 . $ySiO_2$; and $xZrO_2$. $yNa_2O(85-y)$ SiO_2 was studied. It was shown that an increase of ZrO_2 content results in a depolymerization of the structural lattice of glass. It is suggested that Zr is introduced into the glass lattice by disrupting the Si-O-Si bonds. See report 3, abstract 14B493. Author's summary.

SUB CODE: 11/ SUBM DATE: 25Jul65

Card 1/1

L 39671-66 EWT(m)/EWP(e) WH/GD-2
ACC NR: AR6000266 SOURCE CODE: UR/0081/65/000/014/B075/B076

AUTHOR: Botvinkin, O. K.; Demichev, S. A.

TITLE: Study of some properties of glass in the Na_2O_2-ZrO_2-SiO_2 system. Report 5. Study of the structure using an electron microscope

SOURCE: Ref. zh. Khimiya, Abs. 14B495

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2, (123), 1964 27-33

TOPIC TAGS: glass, glass property, zirconium, silicon, matter structure

ABSTRACT: It was determined that glasses in the Na O-ZrO -SiO system are not homogeneous but have a frame work ocntaining silica, and a large number of micro-heterogeneities. These aggregates differ in their composition from the glass framework. The data obtained confirm the micro-heterogenity theory of glass structure. See report 4, 14B494.

SUB CODE: 11 / SUBM DATE: none/ OTH REF: 028

Card 1/1

BOTVINKIN, O. K.

"On diversity of glass structures."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

Glass Inst, Moscow.

BOTVINKIN, O. K.

"Creation of structural heterogeneity in silicate glasses by means of silicon monoxide"

(State Institute of Glass)

At the Division of Physical Chemistry and Technology of Inorganic Materials, Acad. Sci. USSR, a scientific council on the problem of sitalls has been established. The Council is coordinating body for basic scientific research on sitalls, glass, fiber glass, stoneware, refractory and superrefractory materials, and coatings. The purpose of the Council is primarily to contribute to the improvement of the strength and impact resistance of existing materials. In 1963, the council held two sessions.

(Steklo i keramika, no. 6, 1964, 48-49)

L 26101-65 EWT(m)/EWP(b)/T/EWA(d)/EWP(e) Pq-4 WH
ACCESSION NR: AP4047001 S/0072/64/000/010/0001/0004

24
16
B

AUTHOR: Botvinkin, O. K.(Doctor of chemical sciences); Denisenko, O. N.(Engineer)

TITLE: Surface phenomena in the reinforcement of glass by the ion exchange method

SOURCE: Steklo i keramika, no. 10, 1964, 1-4

TOPIC TAGS: glass, reinforced glass, ion exchange, surface phenomenon, lithium glass, potassium chloride, lithium sulfate, potassium sulfate, glass strength

ABSTRACT: During the investigation of ion exchange in glass, destruction of glass was observed during its processing with lithium salt melts. In order to clarify the causes of this destruction, the processing temperature was divided into two ranges: I, below the beginning of the disintegration of the glass skeleton; and II, above this temperature. Experiments were carried out on a vertically drawn glass sample, the lower part of which was treated with a Li salt melt (69.6% by wt. LiCl + 30.4% KCl or 73% Li_2SO_4 + 27% K_2SO_4) at a temperature of 580 C. Traces of corrosion and defects (blisters) on the surface were clearly seen with a decrease in mechanical strength. For comparison, a sample with the same thickness (~ 0.08) of the ion-exchange layer, with the addition of sulfuric acid or bisulfates of alkali metals, was investigated over a temperature range of

Card 1/3

480-580C. The bending strength of 120 x 25 x 2.5 mm glass plates was plotted as a function of the processing temperature in the melt. The formation of blisters on the glass surface was also investigated and found to be due to the [illegible] glass particles on the glass surface. The cause of the [illegible] the immobile glass skeleton, and the adhesion of the salt melt to the glass surface. In processing glass in temperture range II, the surface defects are caused only by adhesion of the glass and the melt, as well as by non-uniform ion exchange. By adding bisulfates (potassium acid sulfate) to the melt, the surface of the silica layer dissolves and causes the adhesion between melt and glass to decrease; therefore, the number of surface defects also decreases considerably. During the processing of glass in lithium salt melts with bisulfate, three physico-chemical processes occur at the melt-glass boundary: diffusion of Li ions into the glass to exchange with soidum ions (the diffusion layer is 80-100 μ thick); increase in packing density of ions in the surface layer, and a corresponding decrease in the coefficients of linear expansion (difference in expansion coefficient of the base and surface glass layer causes compression stresses during cooling); and dissolution of the surface layer of the silica skeleton by 5-8μ. These processes result in increased mechanical strength without causing surface defects during treatment with lithium salts. Orig. art. has: 1 table and 5 figures.

L 26101-65
ACCESSION NR: AP4047001

ASSOCIATION: Institut stekla (Glass institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 001 OTHER: 007

Card 3/3

L 25260-65 EWT(m)/EWP(e)/EWP(b) Pq-4 WH

ACCESSION NR: AP5002929 S/0072/65/000/001/0015/0018

AUTHOR: Ananich, N.I. (Candidate of chemical sciences); Botvinkin, O.K. (Doctor of chemical sciences); Mirenova, M.L. (Candidate of technical sciences)

TITLE: Determination of the thermal treatment region of alkali-borosilicate glasses

SOURCE: Steklo i keramika, no. 1, 1965, 15-18

TOPIC TAGS: glass heat treatment, alkali glass, borosilicate glass, structural birefringence, glass liquefaction, softening point, quartz glass, opalescence

ABSTRACT: A method for determining the change in structural birefringence of sodium-borosilicate glasses upon thermal treatment has been developed to evaluate microphase-separation and the optimum treating temperature for preparing quartz-type glass. Rods or tubes 26 cm in length were low-temperature treated to eliminate stress effects and heated in a laboratory furnace to 400-700C, imposed and automatically controlled over the length of the sample. The change in birefringence, measured after removal of stress effects, involved an increase to a maximum depending on time and temperature of heating, and the zones of visible opalescence were shown to occur at higher temperatures than the maxima of birefringence, as shown in Fig. 1 of the Enclosure. Thermally treated samples were leached with 3N HCl, and the SiO_2 content after leaching was shown to

Card 1/3

L 25260-65

ACCESSION NR: AP5002929

decrease with increasing temperature of thermal treatment. The method can be used to relate thermal effects to the properties of final products or to evaluate the optimum chemical composition of the tested specimens. Orig. art. has: 3 figures.

ASSOCIATION: Institut stekla (Glass institute)

SUBMITTED: 00 ENCL: 01 SUB CODE: MT

NO REF SOV: 006 OTHER: 001

Card 2/3

L 44801-65 EWG(j)/EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(t)/EWP(v)/EPR/EWP(j)/
EWP(t)/EPA(bb)-2/EWP(k)/EWA(l) Pc-4/Pq-4/Pr-4/Ps-4/Pt-7/Pad IJP(c)
RM/WH/WW/JG/AW

ACCESSION NR: AP5012032 UR/0072/65/000/005/0015/0019

AUTHOR: Borisova, I.I.; (Engineer); Botvinkin, O.K. (Doctor of chemical sciences)

TITLE: Study of the conditions of formation of a cobalt oxide coating on glass

SOURCE: Steklo i keramika, no. 5, 1965, 15-19

TOPIC TAGS: coated glass, cobalt oxide coating, cobalt oxide deposition

ABSTRACT: The article is devoted to a study of certain physicochemical relationships governing the deposition of a cobalt oxide coating on glass in the manufacture of glass having protective properties against solar radiation. Attempts were made to determine the structural characteristics of the coating. Aqueous and water-alcohol solutions of cobalt acetate were sprayed in the form of an aerosol onto cold glass substrates, the film was formed at 200-900C, and the samples were subjected to analysis by x-ray diffraction. At 400-800C the film consists of Co_3O_4; above 750C, Co_3O_4 partially dissociates to form CoO. The dependence of the deposition of Co_3O_4 on the time of the aerosol treatment was found to be linear. The dependence of the amount of Co_3O_4 deposited on the temperature of glass, concentration of the solution, and pH of the solution was established. A formula was derived for the thickness of the Co_3O_4 coating: $h = \frac{P \times 10^7}{dS}$, where h is the thickness

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L 44801-65

ACCESSION NR: AP5012032

of the coating in mμ, P is the weight of the coating in g, d is the density of Co_3O_4, taken as 6.07, and S is the surface area of the glass in cm^2. It was established empirically that a coating 100 mμ thick corresponds to the optimum parameters from the standpoint of practical applications. Orig. art. has: 8 figures and 1 formula.

ASSOCIATION: Institut stekla (Institute of Glass)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, IC

NO REF SOV: 005 OTHER: 001

mob
Card 2/2

BOTVINKINA, L.N.

Some characteristics of the genetic types of sediments and the regularities of their stratification in the polaric formations of different climatic provinces. Trudy GIN no.81:332-373 '63.
(MIRA 17:9)

L 60037-65 EWP(e)/EWT(m)/EWP(i)/EWP(b) Pq-4 JAJ/WH

ACCESSION NR: AP5017983 UR/0072/65/000/007/0007/0008
666.11.01:535.323

AUTHOR: Ananich, N.I. (Candidate of chemical sciences); Botvinkin, O. K. (Doctor of chemical sciences); Dyatlova, L. V. (Engineer)

TITLE: Structural birefringence in glass of the system lithium oxide-alumina-silica

SOURCE: Steklo i keramika, no. 7, 1965, 7-8

TOPIC TAGS: double refraction, spodumene glass, glass optical property, structural birefringence, glass crystallization

ABSTRACT: The study was made in order to determine the possibility of the appearance of structural birefringence in glasses from which glass-crystalline materials are obtained, and to identify the cause of optical anisotropy in such materials. The samples studied were selected from the system Li_2O - Al_2O_3 - SiO_2, which had a composition close to that of spodumene and contained 10% TiO_2 as a catalyst. A comparison of the curves representing the temperature dependence of structural birefringence and thermal expansion showed that the birefringence begins to rise at a temperature corresponding to the softening of the glass (700C). Hence, the birefringence in spodumene glass is not due to the interaction between the crystalline and vitreous microphase (microstresses); rather, the increase in birefringence on heating is caused by the formation of the crystalline phase

Card 1/2

L 60037-65

ACCESSION NR: AP5017983

and by the growth of the crystals in an oriented direction. The structural birefringence was found to be very sensitive to temperature changes. The 700-740C range, in which growth of crystals of the main phase takes place, corresponded to the observed marked increase in birefringence. The method described can be used for determining the crystallization range in processes involved in the manufacture of transparent pyroceramics. Orig. art. has: 3 figures.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut stekla (Scientific Research Institute of Glass)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

NO REF SOV: 002 OTHER: 000

BOTVINKIN, Oleg Konstantinovich, doktor khim. nauk, prof.;
ZAPOROZHSKIY, Aleksey Isayevich, kand. tekhn. nauk

[Quartz glass] Kvartsevoe steklo. Moskva, Stroiizdat, 1965.
258 p. (MIRA 18:8)

KISELEVA, Yekaterina Vasil'yevna; KARETNIKOV, German Sergeyevich; KUDRYASHOV, Igor' Vladimirovich; BOTVINKIN, O.K., doktor khim. nauk, retsenzent; MAKOLKIN, I.A., doktor tekhn. nauk, retsenzent; MISHCHENKO, K.P., doktor khim. nauk, retsenzent; GOL'DENBERG, G.S., red.

[Problems and examples in physical chemistry] Sbornik zadach i primerov po fizicheskoi khimii. Moskva, Vysshaia shkola, 1965. 275 p. (MIRA 18:7)

ANANICH, N.I., kand. khim. nauk; BOTVINKIN, O.K., doktor khim. nauk;
DYATLOVA, L.V., inzh.

Structural double refraction in glass of the system $Li_2O - Al_2O_3 - SiO_2$.
Stek. i ker. 22 no.7:7-8 Jl '65. (MIRA 18:9)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut stekla.

L 10426-66 EWP(e)/EWT(m)/EWP(b) WH
AM5028042 BOOK EXPLOITATION UR/

62
61
537/

Botvinkin, Oleg Konstantinovich (Doctor of Technical Sciences, Professor); Zaporozhskiy, Aleksey Isayevich (Candidate of Technical Sciences)

Quartz glass (Kvartsevoye steklo), Moscow, Stroyizdat, 1965. 258 p. illus., biblio. 4,000 copies printed.

TOPIC TAGS: crystal chemistry, quartz crystal, glass property, silica, silicate glass, radiation chemistry, thermal radiation, electric insulation, ceramic seal, quartz optic material, luminescent crystal, gamma radiation, neutron radiation

PURPOSE AND COVERAGE: This book is an introduction to the production and properties of quartz glass and its uses. Results of new studies made in recent years in the U.S.S.R., and abroad are given. Special attention is given to the problem of controlling several properties of this material. The book is recommended for technical engineers and scientists in various fields such as: construction, chemical, lighting engineering and aviation industry, mechanical engineering, light metallurgy, semiconductors production, radioelectronics as well as other fields. It can also be used by university students and technicians working with quartz melting, quartz blowing and optical-mechanical professions.

Card 1/2 UDC: 666.192

L 10426-66
AM5028042

TABLE OF CONTENTS (abridged):

SUB CODE: MT SUBMITTED: 18May65

NO REF SOV: 095 OTHER: 286

Card 2/2 OC

BOTVINKIN, O.K., doktor tekhn. nauk; KULIKOVA, Ye.N., inzh.; RYABOV, V.A., kand. tekhn. nauk; FEDOSEYEV, D.V., kand. tekhn. nauk

Using the statistical theory to estimate the strength of window glass. Stek. i ker. 22 no.9:14-17 S '65. (MIRA 18:9)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut stekla (for Botvinkin, Kulikova). 2. Institut fizicheskoy khimii AN SSSR (for Ryabov, Fedoseyev).

L 23000-00 EWP(e)/EWT(m)/EPA(w)-2/EWA(c) IJP(c) JD/WW/JG/WB

ACC NR: AR6005213 SOURCE CODE: UR/0058/65/000/009/E017/E017

SOURCE: Ref. zh. Fizika, Abs. 9E152

AUTHORS: Botvinkin, O. K.; Demichev, S. A.

TITLE: Investigation of certain properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 1. Investigation of the refractive index and the density of glasses as functions of their composition

REF SOURCE: Steklo. Inform. Materialy, Gos. n.-i. in-ta stekla, no. 2(123), 1964, 1-7

TOPIC TAGS: glass, silicate glass, refractive index, glass property, zirconium compound

TRANSLATION: On the basis of an investigation of the refractive index (RI) and the density of glasses of the Na_2O-ZrO_2-SiO_2 system, it is found that zirconium dioxide, when introduced into the glass up to 22.5%, increases the RI, and in this case the dependence of RI on the composition of the investigated glasses has a linear character. The density of the glasses increases when zirconium dioxide in the same amounts is introduced. An investigation of the RI and calculations have made it possible to establish that the structural coefficient for zirconium dioxide is numerically equal to its molecular weight. On the basis of the experiments it is proposed that the zirconium dioxide enters in the silicon-oxygen core.

SUB CODE: 11

Card 1/1

L 23814-66 EWP(c)/EWT(m)/EPF(n)-2/EWP(t) IJP(c) JD/WW/JG/WB

ACC NR: AR6005211 SOURCE CODE: UR/0058/65/000/009/E016/E016

52
B

SOURCE: Ref. zh. Fizika, Abs. 9E147

AUTHORS: Botvinkin, O. K.; Demichev, S. A.

TITLE: Investigation of certain properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 2. Thermal expansion of glasses and its dependence on the composition

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2(123), 1964, 7-15

TOPIC TAGS: glass, silicate glass, glass property, thermal expansion

TRANSLATION: It has been observed that zirconium dioxide introduced in silicate glass at the expense of decreasing the silica or the alkalis raises the softening temperature of the glass. The coefficient of thermal expansion increases when the ZrO_2 is substituted for SiO_2, since the linear expansion is determined essentially by the content of the alkalis in the glass. Replacement of Na_2O by ZrO_2 leads to a lowering of the coefficient of thermal expansion. In spite of the presence of 15% ZrO_2 by weight, the linear expansion of the investigated glasses increases when SiO_2 is replaced by Na_2O. It is suggested that Si-O-Zr bonds are produced when the zirconium dioxide is introduced into the silicate glass, thus indicating that zirconium participates in the formation of the glass lattice. For part I see Abstract 9E152 (Acc. Nr. AR6005213).

SUB CODE: 11

Card 1/1

L 23815-66 EWP(e)/EWT(m)/EPF(n)-2/EWP(t) IJP(c) SD/WW/GS/WH

ACC NR: AR6005212 SOURCE CODE: UR/0058/65/000/009/E017/E017

61
B

SOURCE: Ref. zh. Fizika, Abs. 9E150

AUTHORS: Botvinkin, O. K.; Demichev, S. A.

TITLE: Investigation of certain properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 3. Microhardness and surface energy of the glasses

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2(123), 1964, 15-21

TOPIC TAGS: glass, silicate glass, hardness, surface hardening, glass property, crystal lattice, zirconium compound

TRANSLATION: It has been observed that zirconium dioxide introduced into glass raises the microhardness, while addition of sodium oxide reduces the microhardness of zirconium glass. The coefficients of volume grinding-together of glasses of the Na_2O-ZrO_2-SiO_2 system are determined. The surface energy of the glasses in the Na_2O-ZrO_2-SiO_2 system is calculated. It is shown that introduction of zirconium dioxide leads to strengthening of the crystalline lattice of the glass. For part II see Abstract 9E147 (Acc. Nr. AR6005211)

SUB CODE: 11

Card 1/1

UDC: 539.3

L 23804-66 EWP(e)/EWT(m)/EPF(n)-2/EWP(t) IJP(c) JD/WW/JG/WH

ACC NR: AR6005214 SOURCE CODE: UR/0058/65/000/009/E017/E017

58
B
15

SOURCE: Ref. zh. Fizika, Abs. 9E153

AUTHORS: Botvinkin, O. K.; Krogius, Ye. A.; Demichev, S. A.; Vlasov, V. A.

TITLE: Investigation of certain properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 4. Reflection spectra in the infrared region

16

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2(123), 1964, 22-27

TOPIC TAGS: glass, silicate glass, glass property, light reflection, optic spectrum, ir spectrum, zirconium compound

TRANSLATION: The IR reflection spectra were investigated in the region of 700--1300 cm^{-1} for three series of glasses, corresponding to the general formulas $yNa_2O \cdot xZrO_2(85 - x)SiO_2$, $xNa_2O(32.5 - x)ZrO_2 \cdot ySiO_2$, and $xZrO_2 \cdot yNa_2O(85 - y)SiO_2$. It is shown that an increase in the amount of zirconium dioxide leads to depolymerization of the structure grid of the glass. A hypothesis is advanced that the zirconium enters the grid of the glass via breaking the Si-O-Si bonds. For part III see Abstract 9E150 (Acc. Nr. AR6005212)

11

SUB CODE: 11, 20

2

Card 1/1 FV

L 23806-66 EWP(e)/EWT(m)/EPF(n)-2/EWP(t) IUP(c) UD/WW/GS/WW

ACC NR: AR6005210 SOURCE CODE: UR/0058/65/000/009/E016/E016

SOURCE: Ref. zh. Fizika, Abs. 9E145

AUTHORS: Botvinkin, O. K.; Demichev, S. A.

TITLE: Investigation of certain properties of glasses in the Na_2O-ZrO_2-SiO_2 system. Report 5. Investigation of the structure with the aid of an electron microscope.

REF SOURCE: Steklo. Inform. materialy Gos. n.-i. in-ta stekla, no. 2(123), 1964, 27-33

TOPIC TAGS: glass, silicate glass, glass property

TRANSLATION: It is established that glasses in the Na_2O-ZrO_2-SiO_2 system are not homogeneous, but have a core consisting of silica and a large number of microinhomogeneities. These aggregates differ in their composition from the core of the glass. The data obtained confirm the microheterogeneous aggregation theory of glass construction. For part IV see Abstract 9E153 (Acc. Nr. AR6005214).

SUB CODE: 11,20

Card 1/1

L 43985-66 EWP(e)/EWT(m) WH

ACC NR: AP6030595 SOURCE CODE: UR/0413/66/000/016/0081/0081

INVENTOR: Botvinkin, O. K.; Yaroker, Kh. G.

34
B

ORG: none

TITLE: Glass with high softening point. Class 32, No. 185024 [announced by State Scientific-Research Institute of Glass (Gosudarstvennyy nauchno-issledovatel'skiy institut stekla)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 81

TOPIC TAGS: silicate glass, heat resistant glass

ABSTRACT: This Author Certificate has been issued for a process of melting and treating silicate glass at a decreased temperature which was achieved by selecting the following formulation (% by wt): 65—75 SiO_2, 20—30 MgO, 4—8 Na_2O, maximum 5 Al_2O_3, and, in addition, 2—8 ZrO_2. Glass with a high softening point was produced. [JK]

SUB CODE: 11/ SUBM DATE: 04May65/ ATD PRESS: 5070

Card 1/1 UCR UDC: 666.113.831' '621'46'33'28

L 43986-66 EWP(e)/EWT(m) WH

ACC NR: AP6030594 (A,N) SOURCE CODE: UR/0413/66/000/016/0081/0081

INVENTOR: Botvinkin, O. K.; Demichev, S. A.; Naydenov, A. P.

ORG: none

TITLE: Glass. Class 32, No. 185023 [announced by Saratov Branch of the State Scientific-Research Institute of Glass (Saratovskiy filial Gosudarstvennogo nauchno-issledovatel'skogo instituta stekla)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 81

TOPIC TAGS: heat resistant glass, aluminoborosilicate glass, acid resistant glass

ABSTRACT: This Author Certificate introduces the following glass formulation (in % by wt): 61—64 SiO_2; 3—5 Al_2O_3; 14—16 B_2O_3, 8—10.5 ZrO_2, and 7—8 Na_2O. The glass has increased thermal stability and acid resistance. [JK]

SUB CODE: 11/ SUBM DATE: 10May65/ ATD PRESS: 5071

Card 1/1 UDC: 666.113.831. 4'623'284'273-31'33

L 43988-66 EWT(m)/EWP(e) WH

ACC NR: AP6030596 SOURCE CODE: UR/0413/66/000/016/0081/0081

INVENTOR: Botvinkin, O. K.; Denisenko, O. N.; Tsaritsyn, M. A.; Proshkina, A. I.

ORG: none

TITLE: A method of increasing mechanical strength and heat resistance of glass products. Class 32, No. 185025

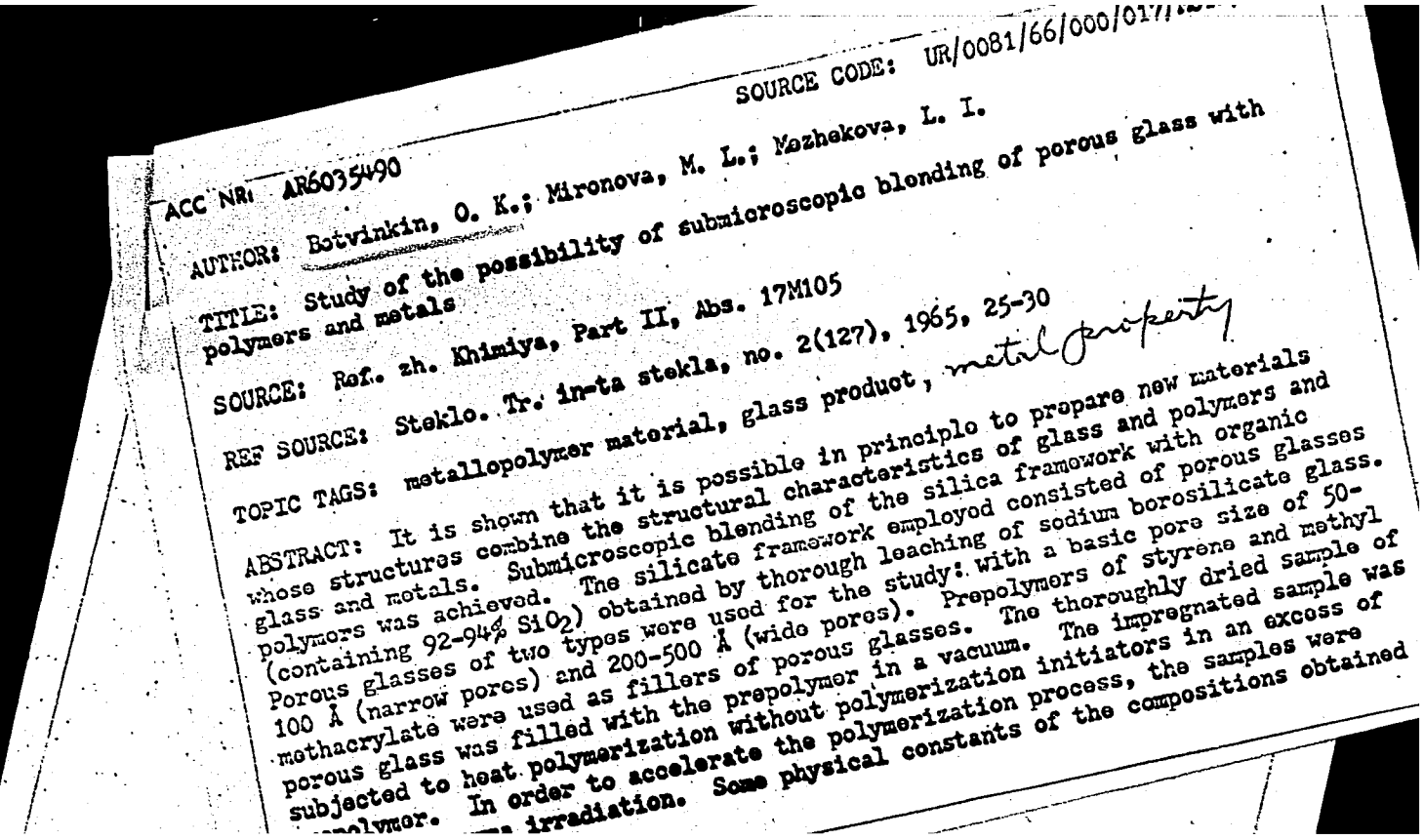
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 81

TOPIC TAGS: glass heat treatment, heat resistant glass, glass mechanical strength

ABSTRACT: This Author Certificate has been issued for a method of treatment of glass products in a mixture of molten alkali sulfates or nitrates to increase mechanical strength and heat resistance and to obtain glass products with a clean and shiny surface. This was achieved by adding to the melt 0.5—5% alkali metal bisulfates. [JK]

SUB CODE: 11/ SUBM DATE: 19May62/ ATD PRESS: 5070

Card 1/1 UDC: 666.1.053.63



ACC NR: AR6035490 SOURCE CODE: UR/0081/66/000/017/...

AUTHOR: Botvinkin, O. K.; Mironova, M. L.; Nazhekova, L. I.

TITLE: Study of the possibility of submicroscopic blending of porous glass with polymers and metals

SOURCE: Ref. zh. Khimiya, Part II, Abs. 17M105

REF SOURCE: Steklo. Tr. in-ta stekla, no. 2(127), 1965, 25-30

TOPIC TAGS: metallopolymer material, glass product, metal property

ABSTRACT: It is shown that it is possible in principle to prepare new materials whose structures combine the structural characteristics of glass and polymers and glass and metals. Submicroscopic blending of the silica framework with organic polymers was achieved. The silicate framework employed consisted of porous glasses (containing 92-94% SiO_2) obtained by thorough leaching of sodium borosilicate glass. Porous glasses of two types were used for the study: with a basic pore size of 50-100 Å (narrow pores) and 200-500 Å (wide pores). Prepolymers of styrene and methyl methacrylate were used as fillers of porous glasses. The thoroughly dried sample of porous glass was filled with the prepolymer in a vacuum. The impregnated sample was subjected to heat polymerization without polymerization initiators in an excess of prepolymer. In order to accelerate the polymerization process, the samples were irradiation. Some physical constants of the compositions obtained

ACC NR: AP6036792 SOURCE CODE: UR/0363/66/002/011/2029/2032

AUTHOR: Botvinkin, O. K.; Denisenko O. N.

ORG: State Glass Institute (Gosudarstvennyy institut stekla)

TITLE: Ion exchange and increase in the strength of glass

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 11, 1966, 2029-2032

TOPIC TAGS: silicate glass, ion exchange, alkali metal

ABSTRACT: The essence of the ion exchange method is that a sodium ion in the melt is exchanged for a lithium ion in the melt. This leads to a decrease in the coefficient of linear thermal expansion in the surface layers in which there are formed compression stresses, and to elongation stresses in the inner layers. The magnitudes of these stresses can be different, and depend on a number of causes. The magnitude of the stress coefficients was calculated by a number of methods. The following well known formula, making it possible to find the stresses in lacquering or enameling, was used to calculate the stresses resulting from ion exchange:

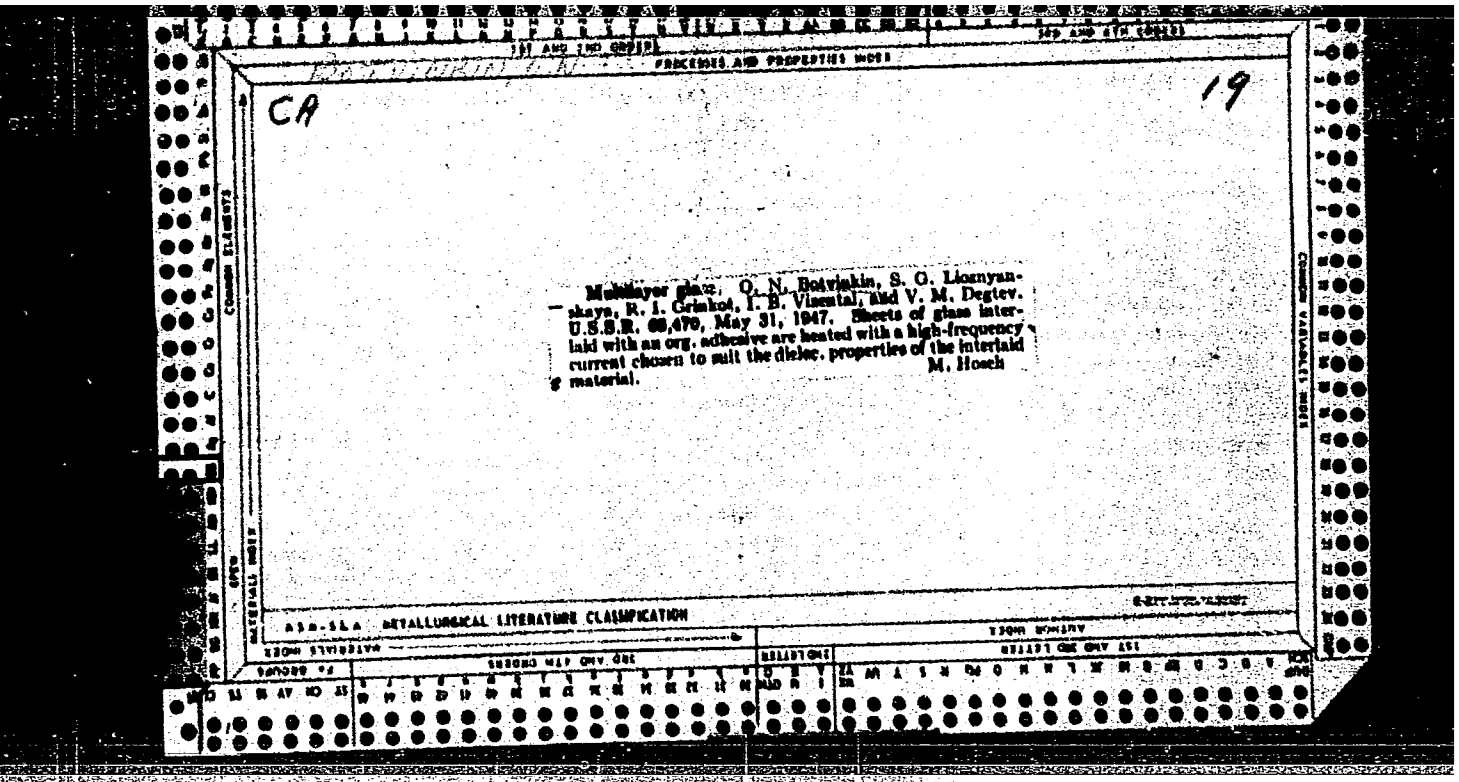
$$\sigma = E(t - t')(\alpha_1 - \alpha_2)(1 - 3k + 6k^2)$$

where t-t' is the temperature difference; $\alpha_1 - \alpha_2$ is the difference in the coefficients

Card 1/2

ALEKSEYEV, V.N., arkh.; KONSTANTINOVA, M.A., arkh.; LOPOVOK, L.I., kand. arkh.; MAKOTINSKIY, M.P., kand. arkh.; Prinimali uchastiye: BOGUSLAVSKIY, A.I., inzh.; LIVSHITS, A.M., inzh.; MASHINA, N.N., inzh.; ANDREYEV, V.S., retsenzent; BOTVINKIN, O.K., doktor khim. nauk, prof., retsenzent; POSOKHIN, M.V., retsenzent

[Catalog of finishing materials and products] Katalog otdelochnykh materialov i izdelii. Moskva, Gosstroiizdat. Pt.3. 1961. (MIRA 18:4)
60 p.
1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh materialov. 2. Rukovoditel' Arkhitekturno-stroitel'nym sektorom Vsesoyuznogo nauchno-issledovatel'skogo instituta novykh stroitel'nykh materialov, Moskva (for Makotinskiy). 3. Rukovoditel' Sektorom tekhniko-ekonomicheskikh issledovaniy Vsesoyuznogo nauchno-issledovatel'skogo instituta novykh stroitel'nykh materialov, Moskva (for Boguslavskiy). 4. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR (for Andreyev, Posokhin).



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Multilayer glass. O. N. Botvinkin, S. O. Lioznyanskaya, R. I. Grinkot, I. B. Vinental, and V. M. Degtev. U.S.S.R. 69,479, May 31, 1947. Sheets of glass interlaid with an org. adhesive are heated with a high-frequency current chosen to suit the dielec. properties of the interlaid material.

M. Hosch

METALLURGICAL LITERATURE CLASSIFICATION

BOTVINKINA, L. N.

USSR/Geophysics - Coal Layers Jan/Feb 52

"Principles Governing the Yield and Typification of Sedimentation Cycles in Coal Layers," L. N. Botvinkina

"Iz Ak Nauk SSSR, Ser Geol" No 1, pp 63-74

Considers cycles of sedimentation as a complex of depositions of various regularly connected facies. Proposes the yields of various types of cycles according to their facial characteristics. Concludes that a change in the vertical cross section of deposits of different genesis preserves similar tendencies in considerable thickness; this possesses great practical significance for the

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USSR/Geophysics - Coal Layers (Contd) Jan/Feb 52

comparison of cross sections. Notes conditions governing cyclicity due to oscillatory movements and the presence of periodicity of various orders. Emphasizes that the study of the phenomenon of cyclicity includes analysis of facies and their paragenetic and paleogeographic conditions.

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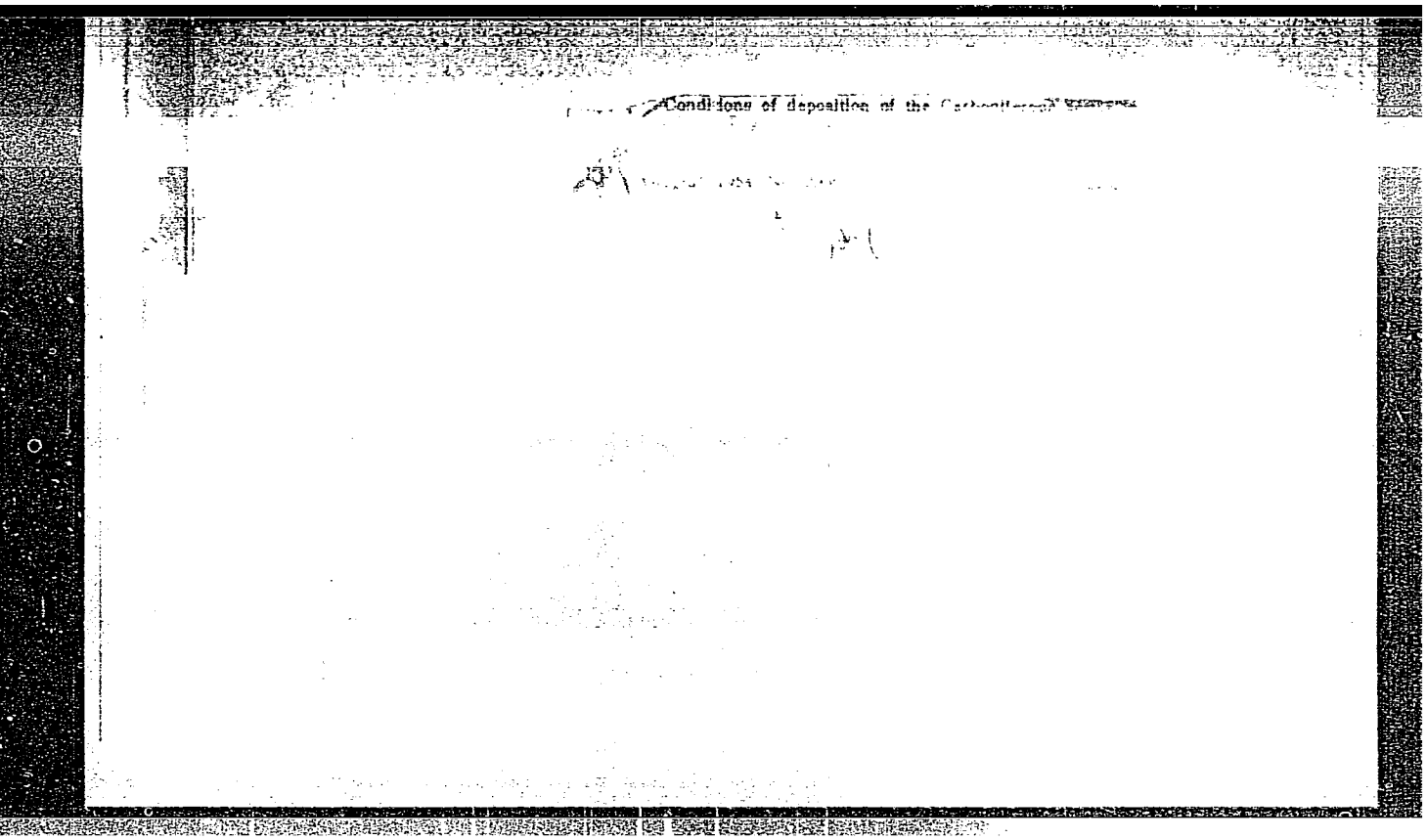

BOTVINKINA, L.N.

[Formation of the carboniferous stratum in the Lenin District of the Kuznetsk Basin] Usloviia nakopleniia uglenosnoi tolshchi v Leninskom raione Kuznetskogo basseina. Moskva, Izd-vo Akademii nauk SSSR, 1953. 106 p. (Trudy instituta geologicheskikh nauk, Akademii nauk SSSR, no.139) (MLRA 6:12)
(Leninsk-Kuznetskiy District--Coal) (Coal--Leninsk-Kuznetskiy District)

BOTVINKINA, L. N.

Fuel Abstracts
May 1954
Natural Solid
Fuels: Sources
and Properties

343. CONDITIONS OF ACCUMULATION OF CARBONIFEROUS SERIES IN LENINSK DISTRICT OF KUZBASS. (USLOVIYA NAKOPLENIYA KAMENNOUGOL'NOY TOLSHCHI V LENINSKOM RAYONE KUZNETSKOGO BASSEYNA). Botvinkina, L.N (Moscow: Akad. Nauk SSSR (Acad. Sci. U.S.S.R.), 1953, 116pp., 7.15 rbls; abstr. in Vestn. Akad. Nauk SSSR (J. Acad. Sci. U.S.S.R.), Sept. 1953, 123). Sedimentation in the Polysaevak section is analysed and a new method of comparing coal seams is mentioned.

BOTVINKINA, L. N.

USSR/ Geology - Coal deposits

Card 1/1 Pub. 46 - 8/19

Authors : Botvinkina, L. N.

Title : Origin of deposit-accumulation cycles in coal-bearing layers

Periodical : Izv. AN SSSR. Ser. geol. 3, 120 - 132, May - Jun 1954

Abstract : Geological data are presented regarding the origin of cyclical sedimentation in coal-bearing layers which is assumed to have had its inception during the regressive series of phases. This problem has special value for coal-bearing layers since they are located in the middle of the sedimentation cycle and can, therefore, be investigated in complex with the deposits preceding and following them. Ten references: 9 USSR and 1 USA (1930 - 1952). Drawings.

Institution: .....

Submitted: July 23, 1953

BOTVINKINA, L.N.; FEOFILOVA, A.P.; YABLOKOV, V.S.

Study of the texture and deposition conditions of the most recent alluvial and other deposits in the lower reaches of the Don River and in the coastal region of the Sea of Azov. Trudy Inst.geol. nauk no.151:30-89 '54. (MLRA 8:8)
(Don Valley--Alluvium) (Azov region--Alluvium)

BOTVINKINA, L.N.

BOTVINKINA, L.N.

Some regularities of paleographic and structural change of coal-bearing deposits of the Donets Basin series C_2^5 and C_1^4. Biul. MOIP. Otd.geol.30 no.3:89-91 My-Je'55. (MLRA 8:10)
(Donets Basin--Coal geology)

BOTVINKINA, L.N.; ZHEMCHUZHNIKOV, Yu.A.; TIMOFEYEV, P.P.; FEOFILOVA, A.P., YABLOKOV, V.S.; IL'INA, N.S., redaktor izdatel'stva; KISELEVA, A.A., tekhnicheskiy redaktor

[Atlas of lithogenous type middle Carboniferous coal deposits in Donets Basin] Atlas litogeneticheskikh tipov uglenosnykh otlozhenii srednego karbona Donetskogo basseina. Moskva, Izd-vo Akademii nauk SSSR, 1956. 367 p. (MLRA 9:10)
(Donets Basin--Coal geology)