BEZ BORODOV, M.A.

Chemical stability of glasses from peat slags. M. A. Bez-borodov and L. Ya. Mazelev. *Doklady Akad. Nauk S.S.S.R.* 94, 131-34 (1954).—Glasses from peat slags analyzed SiO_2 37.28 to 44.88, TiO_2 0.24 to 0.31, Al_2O_3 15.28 to 19.78, Fe_2O_3 8.45 to 10.78, CaO 22.14 to 30.60, MgO 1.50 to 1.82, Na_2O 2.23 to 4.63, and K_2O 0.58 to 0.74%. Stability against water, alkaline solutions, and alkaline carbonates proved satisfactory, but tests with acids (HCl, H_2SO_4) showed that many of the glasses were deeply destroyed and corroded "right through" by the solution, losing the original vitreous condition and changing in color, specific gravity, refraction, and adsorption capacity. B.Z.K.

BEZBORODOV, M. A.

Colloidal colouring agents and microporosity of glasses. M. A. Bezborodov (*Doklad. Akad. Nauk SSSR*, 1954, 95, 349—352).—Coloration of glasses by additions of Cu, Ag, Au, and other colloidal substances is made possible by the microporous structure of glasses. The colloidal particles imparting colour to glasses have dimensions of 200—300 A. which suggests the existence of pores of similar size. Evidence as to the existence of such pores is provided by the fact that the *d* of cryst. quartz is 2·65 and that of SiO_2 glass only 2·20. Also, according to the data in literature, the SiO_2 glass consists even at 1300—2000° of aggregates of several hundred elementary SiO_4'''' terrahedrons, several hundred A. long. The fact that these aggregates are not packed as closely as the SiO_4'''' terrahedrons in cryst. quartz confirms the existence of micropores of dimensions ~300 A.

S. K. Lachowicz.

BEZBORODOV, M.A.

Chemical examination of Russian glasses of the XIth and XIIth centuries. M. A. Bezborodov and M. V. Fekhner (State Museum of History, Moscow). *Doklady Akad. Nauk S.S.S.R.* 93, 1037-40(1953).—The archaeological investigation of the ruins, fields, and tombs of the pre-Mongolian era concerns especially bracelets, beads, and goblets of glass (Kiev, Novgorod, Grodno, Minsk, Staryi Ryazan, Ladoga, Beloozero, etc., as centers). Previously, the glass beads and goblets were assumed to have originated in the Orient; the indigenous origin in Russia is, however, now established. Centers of manufacturing were in Kiev, Kostrem, and Ralkovets. Even multicolored-glass techniques were known. This fact is confirmed especially by chem. analyses of glass products, and the raw materials for their color pigments. (1) Liver-brown and red beads are high in PbO (60%), in the ratio $PbO:SiO_2 = 1:2$, with $PbO + SiO_2 = 94\%$. Cu_2O and Fe_2O_3 are the chief color pigments; CaO, MgO, alkalies, Al_2O_3, TiO_2, and SO_3 are only accessories. (2) A colorless goblet of a K Ca silicate glass (with 13.35% K_2O, 18.57% CaO), high in P_2O_5 (4.41%), indicates the use of bone and wood ash as raw materials. (3) Beads of a K Pb silicate glass are particularly interesting because of their compn. which is in the system K_2O-PbO-SiO_2 projected in the immediate neighborhood of the compd. $K_2O.PbO.4SiO_2$. The sum $K_2O + PbO + SiO_2$ is about 93 to 97%, the m.p. only 750° to 800°. Potash, quartz sand, and PbO were the chief raw materials, but no ash was added (cf. the absence of CaO). This result is important, because previously the use of potash was not known in Russia before the XVth century. The sulfate content of the raw potash is also very characteristic; CoO as pigment was imported from Iran. A violet-colored bead contains 1.96% MnO, evidently coming from

Effect of zirconium dioxide on light refraction of silicate glasses. M. A. Bezborodov and A. I. Zelenskii. *Doklady Akad. Nauk S.S.S.R.* 95 (1) 137–39 (1954).—Eight series of experimental glasses were prepared from the original glass of SiO_2 75, CaO 10, and Na_2O 15% by substituting various amounts of ZrO_2 for SiO_2, CaO, and Na_2O and also by adding or substituting such components as MgO, ZnO, K_2O, and Li_2O. With increasing content of ZrO_2, refraction also increased. Increase in refraction by substitution of ZrO_2 for other components follows a straight line in all cases. Increase in refraction with ZrO_2 differs with the glass and depends on the composition as a whole as well as on the nature of the oxide which it replaces. The partial number of refraction for ZrO_2 in silicate glasses was calculated as 2.170; this differed, on the average, by 0.2% from the experimental value. Crystal glass with 0.2% ZrO_2 and equivalent in refraction to that made with 21.5% PbO was prepared (n_D of the former was 1.545, and that of the latter 1.540). B.Z.K.

BEZBORODOV, M.A.

Chemical composition and technological methods of glass production in ancient Russia. M. A. Bezborodov (I. V. Stalin White-Russian Polytech. Inst., Minsk). *Doklady Akad. Nauk S.S.S.R.* 97, 1041–4(1954).—Not only in Kiev, but also in many other centers, e.g. in Nizhnii-Novgorod, Staryi-Ryazan, etc., glass manufg. has flourished in the 11 to 13th centuries, before the Mongolian regime. Twelve new analyses of old Russian glass products of this time are given, chiefly of bracelets, beads, mosaic stones, etc. from different cathedrals. They not only show a high variability of colors and compn., but the viscosity must have also varied greatly. The most fluid glasses, e.g. of mosaic stones, have been cast from the melt at relatively low temps. in metal or ceramic molds. These glasses are high in PbO, e.g. 1 PbO + 1.0 to 1.3 SiO_2, with relatively high contents of SnO_2 as opacifying agent. Bracelets have been drawn from the only softened glass, with a viscosity of about 10^3 poises, of a "short" type. Bubbles included show the characteristic ellipsoidal-stretched shape. Such glasses are K-Pb glasses, e.g. 1 K_2O, 1 PbO, 5 SiO_2, similar to modern glasses for radio vacuum tubes (Philips). Beads of the same glass type show that they have been pressed in closed molds ("gables"). Goblets were formed by blowing, especially of K-Ca silicate glasses with some MgO and P_2O_5, e.g. 1.0 K_2O; 2.3 CaO; 6.8 SiO_2. Among the mosaic stones of the Pb silicate group, some SnO_2-free, but Cu_2O-contg. red-colored aventurine glasses are remarkable. The chem. compn. is of the type 1.0 PbO; 1.5 to 2.0 SiO_2.

W. Eitel

Bezborodov M.P.

3

Study of the solubility of sulfur trioxide in glass. [illegible]

[illegible] and charcoal in the amt. calcd. for reaction with Na_2SO_4 [illegible] also in half and in twice this amt. were fused under air, under CO_2, and under SO_2. With half the theoretical quantity of C in the mixt. fusion in air gave glass containing about as much SO_3 as that which was obtained on fusion in CO_2 or in SO_2. With the theoretical amt. of C the SO_3 content of the glass fused in air contained half as much SO_3 as that fused in CO_2 and SO_2. With twice the theoretical C, glass fused in air contained $\frac{1}{3}$ the amt. of SO_3 found in glass fused in CO_2; glass fused in SO_2 was higher in SO_3 than that fused in CO_2. Phys. properties and the SO_3 content of the glasses are given. Sulfate bubbles disappear at [illegible] at lower temps. the gas in the bubbles consists of [illegible] vols. of SO_2 per one vol. of O_2, probably owing to the [illegible] of SO_3 at these temps. [illegible]

Synthesis of glasses from low-melting clays of White Russian (Byelorussian) S.S.R. and study of some of their characteristics. M. A. Bezborodov and I. A. Kunger'ko. *Izvest. Akad. Nauk Belorus. S.S.R., Ser. Khim. Nauk* No. 6, 81-78 (in Russian).—The melting properties and phys. characteristics have been studied for expt'l. glasses contg. Al_2O_3 6–10, K_2O 0.4–15.2, and CaO 7–17 at the sum of $SiO_2 + Al_2O_3$ in 68–70%, resp. The glasses contg. much Al_2O_3 equal to total percent of $SiO_2 + Al_2O_3$ were most difficult to melt. With increasing amt. of Al_2O_3 the total amt. of $SiO_2 + Al_2O_3$ should be decreased. The best cryst. properties were with the glasses contg. the lowest amt. of $CaO + Al_2O_3$. With increasing amt. of Al_2O_3, were most difficult to melt. decreased. By increasing the concn. of CaO on the expanse of SiO_2 or Na_2O the phase of the primary crystn. of wollastonite is shifted to the phase of tridymite. Within the range of the concns. of SiO_2 69–70, Al_2O_3 6.0, Fe_2O_3 13.2–14.2, K_2O 1.0, and TiO_2 0.1%, resp., the wollastonite compn. of the glasses changes to the tridymite compn. The crystn. property of the glasses increases with the addns. of MgO. By a continuous increasing of the MgO to the concn. of 4.5% the cryst. phases of the glasses change from tridymite to diopside through wollastonite. The max. crystn. properties show the glasses at the temp. corresponding to "zero menis-cus." Data are given for the resistance of the glasses contg. SiO_2 66.1–71.1, TiO_2 0.1, Al_2O_3 5.8–6.2, Fe_2O_3 1.4–1.5, CaO 7.0–7.5, MgO 0.3–4.6, Na_2O 11.8–14.3, and K_2O 1.0% 20.24% HCl, which indicate that these expt'l. glasses are of superior quality in comparison with the common window glasses. For the industrial use the clays with a low concn. of Al_2O_3 and Fe_2O_3 should be used. Formulas are given for the calcn. of the glass batches contg. the components of a complex chem. compn. such as clays.

E. Werbicki

Bezborodov M.A

34. Experience in the use of ultrasonics for the mechanical treatment of glass.—M. A. BEZBORODOV, A. A. GEZBURO, and N. P. KRASNIKOV (*Glass & Ceramics*, Moscow, 12, No. 6, 11, 1955). In Russian. Experiments show that ultrasonics can be used for the grinding of glass; whereas in normal grinding not more than a quarter of the abrasive grains are effective—the grains moving parallel to the surface ground—in ultrasonic grinding all the grains are effective and move perpendicularly to the surface ground. It was not found possible to grind ultrasonically without abrasives. Although it is concluded that grinding by means of ultrasonics is possible, the thickness of the layer ground off varies within rather wide limits (0·01 to 0·05 mm.).

(2)

Bezborodov, M. A.

USSR/ Miscellaneous--Archaeology

Card 1/1 Pub. 86--11/39

Authors : Bezborodov, M. A., Prof.

Title : Glass making in ancient Russia

Periodical : Priroda 44/1, 70--76, Jan 1955

Abstract : The view formerly held that glass making did not begin in Russia until the 17th century is contradicted by the findings of the Russian archaeologist, V. V. Khvoyko, who proved that the making of glass was carried on in Kiev in the 11th century. Soviet archaeologists have also found evidences of glass making in other places in early times. Samples of ancient articles made of glass are illustrated in color with descriptions of each sample and a table showing the composition of ancient glass. Eleven Russian and Soviet references (1913--1954). Illustration; table.

Institution : .....

Submitted : .....

BEZBORODOV, M. A.

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

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62258

Author: Bezborodov, M. A., Konopel'ko, I. A.

Institution: None

Title: Syntheses of Glasses from Readily Fusible Clays of BSSR and Study of Some of Their Properties

Original Periodical: Vestsi AN BSSR, 1955, No 6, 57-69; Belorussian; Izv. AN BSSR, 1955, No 6, 61-73

Abstract: Study of fusibility and fabricating properties of glasses containing (in %): Al_2O_3 6-16; K_2O 6.4-15.2; CaO 7-17; total $SiO_2 + Al_2O_3$ 68-76. Glasses with higher Al_2O_3 content and same total $Al_2O_3 + SiO_2$ were found to be more refractory and difficult to fabricate. On increasing the Al_2O_3 content in the new glasses it is necessary to lower the total $Al_2O_3 + SiO_2$. In crystallization properties glasses having a lower $CaO + Al_2O_3$ content were best; the higher

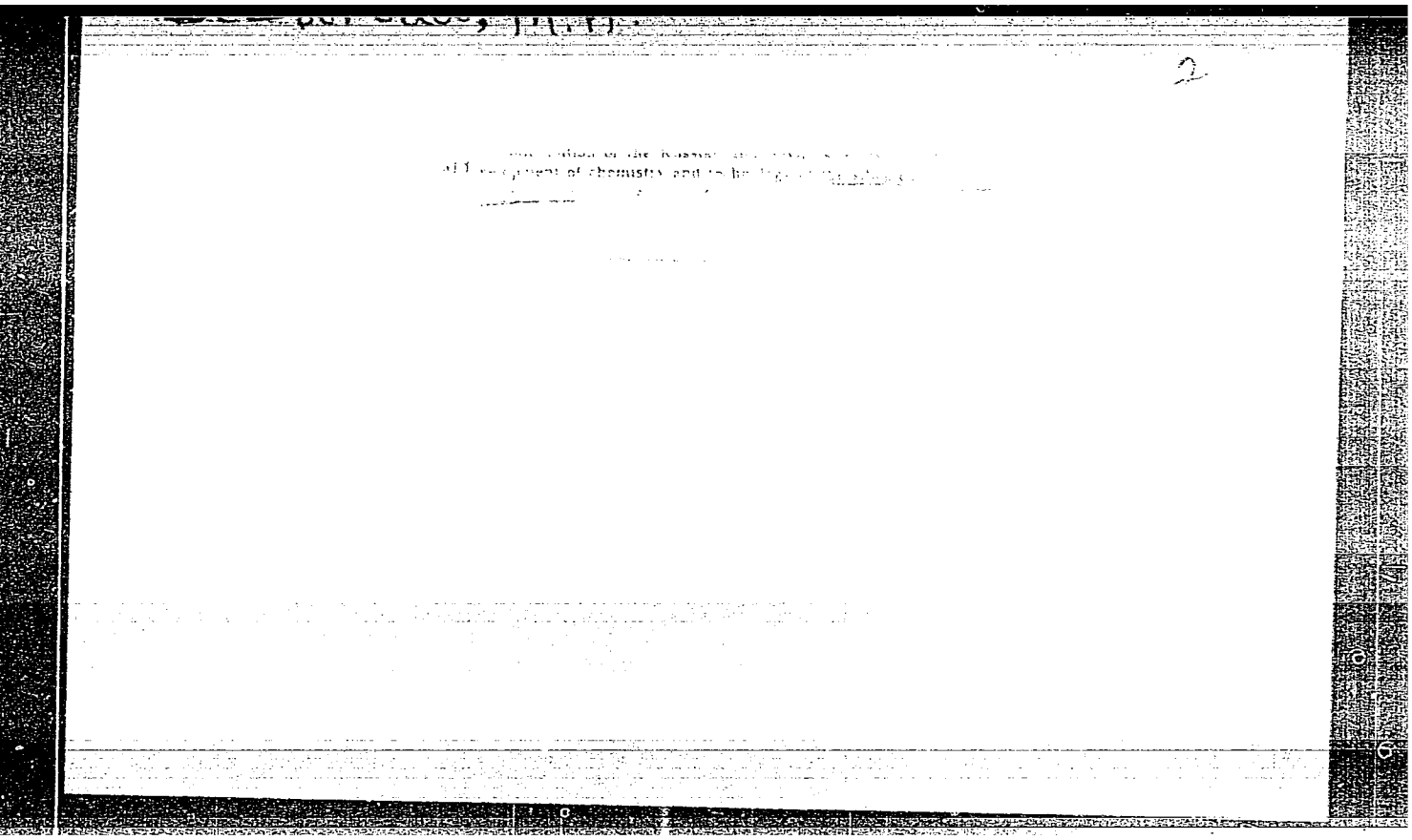
Card 1/2

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

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62258

Abstract: the Al_2O_3 content of the glass the less should be the CaO + Al_2O_3. Decrease in CaO content compensated by SiO_2 or Na_2O shifts the glass compositions from the region of primary crystallization of wollastonite toward that of tridymite and decreases crystallization. In the case of glass compositions located within the limits of the wollastonite-cristobalite boundary line a lowering of Na_2O content to 2% has little effect on crystallization, while addition of MgO increases it sharply. Transition of glass compositions from wollastonite region into diopside region is accompanied by further increase in crystallization. A study was made of chemical stability of the glasses and compositions are recommended which are suitable for mechanized manufacture of blown articles.

Card 2/2



BEZBORODOV, M.A.

Effect of titanium on some properties of silicate glasses. M. A. Bezborodov and I. I. Kisel (*Doklad. Akad. Nauk SSSR*, 1955, 102, 1075—1078).—Glasses of the compositions $(75-x)SiO_2.xTiO_2.16MO.15M'_2O$ and $(75-x)SiO_2.(10+x)TiO_2.15M'_2O$ were prepared, where x is 0—45, M is Ca, Ba, or Pb, and M' is K or Na. Resistance to extraction by water or aq. Na_2CO_3 falls as x rises from 0 to 2, and then rises continuously to $x = 32$; resistance to extraction by dil. HCl falls to $x = 2$, then rises to a max. at $x = 8-16$, and then falls sharply. The n of the glasses rises continuously with rising x. Max. tendency towards de-vitrification is for $x < 5$ or >20. Glasses with $x = 0$—13 are colourless, with $x = 13$—24 are yellow, and with $x = 24$—36 are brown.

R. TRUSCOTT

BEZBORODOV, M. A.

Use of ultrasonics for mechanical treatment of glass. M. A. Bezborodov, A. A. Ginzburg, and N. P. Krasnikov. Keram., 12 (6) 11-12 (1955). Apparatus for ... described. 1 reference.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205130010-9"

Old-Russian glasses of the eleventh to thirteenth century, their chemical composition and manufacture. M. A. Bezborodov. *Belorussk. Politekh. Inst., Sbornik Nauch. Rabot* 1955, No. 47, 3–17; cf. *C.A.* 49, 682g, 2041f; Kachalov as cf. Vargin, *C.A.* 49, 682c.—The historical opinion that there was no indigenous glass technology in Russia before the fifteenth century but that all the older glass samples found were imported from western countries goes back to Aristov (Petersburg, 1866). Already in 1852, however, Chugunov made evident that there was a real medieval glass production in Russia, and Shmidt (1862) confirmed this conclusion. Especially in Ukraine, with Kiev and Galich as the centers, a high civilization on hellenistic basis developed also glass manufg., especially for ornamental purposes (colored beads, bracelets, etc.), since the eleventh century. The recent tumulus excavations by Bogusevich and Dovzhenok (1954), gave a material which was examd. by the author; 12 complete chem. analyses of fragments of beakers, bracelets, beads, etc., are given. Particularly interesting are opaque smalts from a mosaic in the cathedral of Chernigov (finished in 1186), of yellow, liver-red, or green color, with SnO_2 contents up to 6%, PbO up to 76%. Among the other glasses the PbO contents vary between 29.3 and 60.4%; CuO (2.15%) was only in one blue bead, MnO (up to 0.7%) in a beaker, together with 4.4% P_2O_5 and 18.6% CaO. The use of bone ash is here evident as a raw material. K_2O (13.4 to 15.3%) is always much higher than Na_2O (0.2 to 1.0%). The glasses are classified as (1) melts based on the mol. ratios 1 PbO:1.0 to 1.3 SiO_2; (2) K-Pb glasses in the ratio 1 K_2O: 1 PbO: 5 SiO_2; (3) K-Ca glasses, with 1 K_2O: 2.3 CaO: 6.8 SiO_2; (4) some glasses with 1 PbO: 2 SiO_2, with Cu_2O as an intense opacifying agent. The technological processes of casting, pressing, drawing, and blowing were equally used in manufg. the easily fluid glass melts of this early medieval period. W. Eitel

BEZBORODOV, M.A.; CHENAKAL, V.L., nauchnyy redaktor; SHMEYDER, Ye.B. redaktor; PANOVA, L.Ya., tekhnicheskiy redaktor

[M.V.Lomonosov, founder of scientific glassmaking] M.V.Lomonosov - osnovopolozhnik nauchnogo steklodeliia. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 113 p. (MLRA 10:4)
(Glass manufacture) (Lomonosov, Mikhail Vasil'evich, 1711-1765)

BEZBORODOV, M.A.

USSR/General Questions A

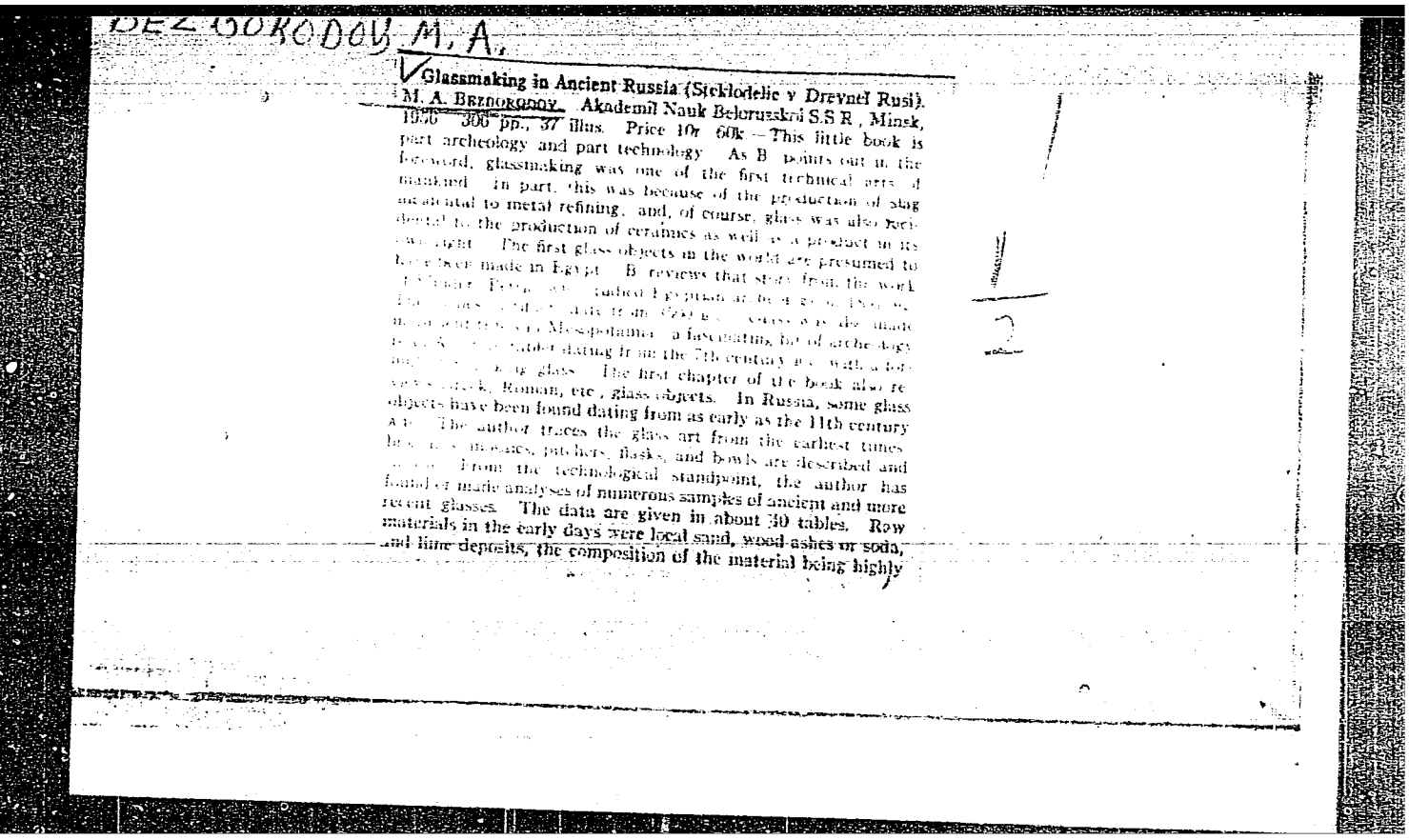
Abs Jour: Ref Zhur-Khimiya No. 7, 1957, 21975

Author : Bezborodov, M. A.
Inst : None
Title : M. L. Lomonosov - founder of scientific glassmaking.

Orig Pub: Promstroyizdat, 1956, 115 pages w. illustration 7.15 roubles.

Abstract: No abstract.

Card 1/1



BEZBOKODOV, M. A.

Glassmaking in Ancient Russia (Steklodelie v Drevnei Rusi). M. A. Bezbokodov. Akademii Nauk Belorusskoi S.S.R., Minsk, 1956. 300 pp., 97 illus. Price 10r 60k.—This little book is part archeology and part technology. As B. points out in the foreword, glassmaking was one of the first technical arts of mankind. In part, this was because of the production of slag incidental to metal refining, and, of course, glass was also incidental to the production of ceramics as well as a product in its own right. The first glass objects in the world are presumed to have been made in Egypt. B. reviews that story from the world [illegible] Egyptian [illegible] Mesopotamia, a fascinating bit of archeology [illegible] dating from the 7th century B.C. with a lot [illegible] glass. The first chapter of the book also re[illegible] Roman, etc., glass objects. In Russia, some glass objects have been found dating from as early as the 11th century A.D. The author traces the glass art from the earliest times [illegible] From the technological standpoint, the author has [illegible] made analyses of numerous samples of ancient and more recent glasses. The data are given in about 30 tables. Raw materials in the early days were local sand, wood ashes or soda, and lime deposits, the composition of the material being highly

BEZBORODOV, M.A

variable. Later developments include the replacement of soda by potash as well as the use of coloring materials. The work of which this book is a report was a series of analyses [illegible] ancient glass carried out at the Byelorussian [illegible] tute. The report is intended for the techn[illegible] the archeologist or antiquarian. The [illegible] mented, with 163 references, a substan[illegible] papers published by the author. [illegible]

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BEZBORODOV, M.A.

USSR / Acoustics. Ultrasonics. J-4

Abs Jour -: Ref Zhur - Fizika No 3, 1957, No 7479

Author : Bezborodov, M.A., Gerburg, A.A., Krasnikov, N.P.
Inst : None
Title : Experience in the Application of Ultrasonics to the Mechanical Working of Glass.

Orig Pub : Sb. statey Vses. Zaoch. politekhn. in-ta, 1956, vyp. 13, 26-34

Abstract : After giving brief information on the nature of ultrasonic oscillations, the results of experimental work on the application of ultrasonics for polishing glass are reported. The experiments were made with a machine constructed at the Leningrad Metal Plant by Engineer, M.M. Pisarevskiy. Glass plates with a surface of 20 x 8 mm were polished. The area of the working tool varied from 20 x 1 mm to 20 x 20 mm, and the amplitude of the oscillations varied from 0,005 to 0,02 mm, and the time for a single cut ranged from 10 to 20 seconds. The thickness of the

Card : 1/2 - 79 -

BEZBORODOV, M.A.; GEZBURG, A.A.; KRASNIKOV, N.P.

Experience in using ultrasonic waves for mechanical treatment of glass. Sbor.nauch.rab.Bel.politekn.inst. no.55:12-18 '56. (MLRA 10:2)
(Glass) (Ultrasonic waves--Industrial applications)

Bezborodov, M.A.

USSR / Optics.

K

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10313

Author : Bezborodov, M.A., Zelenskiy, A.I.
Inst : Not Given
Title : Effect of Zirconium on the Crystallization Ability and Light Refraction of Certain Silicate Glasses.

Orig Pub: Sb. nauch. rabot Belorus. politekhn. in-ta, 1956, vyp. 55, 45-53

Abstract: To study the effect of zirconium on the properties of glass, 302 specimens were prepared. Upon crystallization of the glass, the primary phase is either the cristobalite, or the β -wollastonite (with the ZrO_2 contents being greater than or equal to 18%). It is assumed that ZrO_2 cannot be a "muffler." The dependence of n_d on the contents of ZrO_2 in glass of various composition was measured. A recipe is worked out for zirconium cut glass, $n_d = 1.549$.

Card : 1/1

BEZBORODOV, M.A.

Microporous structure of glass in connection with its coloring with colloidal colorants. Sbor.nauch.rab.Bel.politekh.inst. no.55:3-11 '56. (MLRA 10:7)

(Glass)

BEZBORODOV, M.A.

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

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12520

Author : Bezborodov M.A., Zelenskiy A.I.
Inst : Belorussian Polytechnic Institute
Title : The Effect of Zirconium on Crystallizability and Refraction of Some Silicate Glasses

Orig Pub : Sb. nauchn.rabot Belorus. politekhn. in-ta, 1956, No 55, 46-53

Abstract : ZrO_2 can be included in glass up to 20% in lieu of SiO_2, up to 10% in lieu of CaO and up to 5% in lieu of Na_2O. Such zirconium glasses (ZG) do not require higher temperatures of melting. 1-4% Al_2O_3 can be added to glass containing 0.5-5% ZrO_2. MgO or ZnO included in lieu of CaO, up to 10%, do not affect the melting process of ZG. Inclusion of Li_2O in lieu of Na_2O, up to 15%, produces a readily fusible ZG. Inclusion of K_2O

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

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12520

in lieu of Na_2O, enhances the refractory properties of ZG. 1-7% K_2O in lieu of Na_2O can be added to glass containing 0.5-10% ZrO_2. In the compositions studied, ZrO_2 did not cause any opaqueness. Insufficient melting with an increased content of ZrO_2 in the glass (> 15%) is caused by zircon particles remaining in the melt due to an incomplete reaction during the process of glass formation. Melting conditions of glass production remain practically unchanged on using pure ZrO_2 in place of zircon. Inclusion of ZrO_2 decreases considerably the crystallizability of the glass. ZrO_2 raises the index of refraction from 1.517 (in the absence of ZrO_2 in the glass) to 1.595 (with 20% ZrO_2 in the glass). The authors are of the opinion that ZrO_2 can replace PbO in crystal glass.

Card 2/2

BEZBORODOV, M.A.; SHARAY, V.N.

Chemical petrographic analysis of some new formations in industrial glass. Sbor.nauch.rab.Bel.politekh.inst. no.55:54-63 '56. (MLRA 10:7)

(Glass)

RASKIN, N.M.; BEZBORODOV, M.A., red.; KNYAZEV, G.A., red.; FIGUROVSKIY, N.A., red.; ZAYCHIK, N.K., red. izd-va; ARONS, R.A., tekhn. red.

[Manuscripts of chemists of the second half of the 18th century in the Archives of the Academy of Sciences of the U.S.S.R.] Rukopisnye materialy khimikov vtoroi poloviny XVIII v. v Arkhive Akademii Nauk SSSR. Nauchnoe opisanie. Moskva, Izd-vo Akademii Nauk SSSR, 1957. 212 p. (MIRA 11:1)

(Leningrad--Manuscripts) (Bibliography--Chemistry)

USSR/Microbiology. Technical Microbiology F

BEZBORODOV, M A

Abs Jour : Ref Zhur-Biol., No 13, 1958, 57598

Author : Bezborodov M. A., Vil'dflush R. T.
Inst : Academy of Sciences Belorussian SSR
Title : Effect of the Microflora of Clays on their Plasticity.

Orig Pub : Izv. AN BSSR, Ser. fiz-tekhn. n., 1957, No 1, 11-21

Abstract : Ammonificating bacteria and aspergillus fungi were discovered in three samples of clay which were investigated. No desulfating, butyric acid, and cellular bacteria were found. An increase of 3.72% in the plasticity of the clays was obtained within 30 days by the action of ferments prepared from the cultures of microorganisms isolated from clay and cultured on a mixture of

Card 1/2

BEZBORODOV, M.A., akademik; POBKOVA, N.M.

Thermal expansion of cesium silicate glass. Dokl. AN BSSR 1 no.1: 13-16 Jl '57. (MIRA 11:3)

1. AN BSSR (for Bezborodov).
(Expansion (Heat)) (Glass)

BEZBOROLOV, M. A.

Glass manufacturing in the 11th and 12th centuries in Rus and Poland. p. 118. (Szklo I Ceramika, Vol. 8, No. 5, May 1957, Krakow, Poland)

SO: Monthly List of East European Accessions (EEAL) Lc. Vol. 6, No. 8, Aug 1957. Uncl.

Bezborodov, M.A.

72-11-8/9

AUTHOR: Bezborodov, M.A., Professor, Member AN BSSR

TITLE: Science of Ceramics in the USSR (Nauka o keramike v SSSR)

PERIODICAL: Steklo i Keramika, 1957, Nr 11, pp. 25 - 28 (USSR)

ABSTRACT: Up to the outbreak of the October revolution in 1917 scientific research on ceramics was limited to only a few laboratories of some technical colleges. Practical work in the factories had no contact with science. The employers preferred to work with imported foreign raw materials (from England, Holland and Norway). The domestic raw materials were used only as addition to the mass. After the revolution a number of institutes were foundded. In the years 1921 - 1922 the State Experimental Institute for Silicates was founded in Moscow and in 1931 the Institute for Glass was separated from it. In 1932 the All-Union Institute for Building Materials was divided up into three institutes one of them for ceramics. In the years after the October revolution institutes for silicates were founded in Tomsk, in the Ural as well as in Kharkov. In the years 1938 - 39 the State Electric Ceramics Research Institute was founded. At that time scientific research laboratories for silicates and ceramics were founded

Card 1/2

Teaching Ceramics in the USSR

with the chairs of some colleges. Technical editions played an important part in the development and distribution of the knowledge obtained. In 1925 the periodical "Keramika i Steklo" was founded. Furthermore some principal directions of research are mentioned: systematic research of domestic raw materials for ceramics mentioned collectively in the monography "Clays of the USSR"; the investigation of the Al_2O_3 - SiO_2 - ZrO_2 - system; the improvement of the composition of mass as well as of the technology of insulator production; the development of the masses and the technology of artificial porcelain teeth and of tooth-cements; production of domestic ceramic colors and glazings, etc. There are 2 figures.

AVAILABLE: Library ofCongress

Card 2/2

BEZBORODOV, M.A.

3-12-12/27

AUTHOR: Bezborodov, M.A. Professor, Academician of the BSSR Academy of Sciences.

TITLE: Laboratory for Special Problems at the Vtuz (Problemnaya laboratoriya vo vtuze)

PERIODICAL: Vestnik Vysshey Shkoly, 1957, # 12, pp 60 - 63 (USSR)

ABSTRACT: A scientific-research laboratory of silicates and glass was opened at the Belorussian Polytechnic Institute. For this purpose a test plant for glass synthesis consisting of various furnaces was installed, and modern equipment made available by the Ministry of Higher Education. The wide range of problems to be treated required the collaboration of other chairs and specialists of petrography. Contracts signed with the industry were expanded and a close connection with industrial organizations established, a scientific council was created including scientific collaborators, representatives of industry and participating chairs. The author enumerates the problems set before this laboratory. The laboratory will develop researches in two directions: obtaining synthesis of refractory glass at low temperatures and the investigation of phenomena appearing in the application of accelerators. An increasing number of elements is

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now applied for glass synthesis which gave interesting results. The application of cesium for instance permitted to obtain glass with an unusually wide linear heat expansion, up to 250 - 280 . 10^{-7}, a softening's temperature under 200° and a light refraction of over 1.78. Some systems will be investigated permitting the creation of glasses with increased heat resistance and a capacity to be welded with metals of great heat expansion.

ASSOCIATION: The Belorussian Polytechnic Institute imeni I.V. Stalin (Belorusskiy politekhnicheskiy institut imeni I.V. Stalina)

AVAILABLE: Library of Congress

BEZBORODOV, M. A.

2027. Bentonite faience for facing-ceramics.—M. A. Bezborodov and E. F. Polufk TOVA (*Glass & Ceramics*, Moscow, 14, No. 4, 13, 1957). In Russian. Experiments were carried out on the use of bentonite clays in wall-tile bodies. Specimens (for semi-dry pressing) were prepared in 3 series: (1) kaolin and bentonite; (2) kaolin, bentonite, and quartz sand; (3) kaolin, bentonite, quartz sand, and pegmatite. The content of bentonite varied from 6 to 30%. Mixes containing 8% moisture were pressed at 2,850 p.s.i. and tested, green and dry, for transverse and crushing strength. The strength increased with increasing bentonite content, but non-uniformly, showing maxima between 10–15% and between 25–30% bentonite. The first maximum might be due to a denser packing and the second to the high content of fine bentonite virtually conferring on the body the properties of a clay. The best firing-temperature was 1,150–1,180°. The high green strength and resistance to breakdown in water make one-fire firing possible. The whiteness of ware containing up to 15% bentonite is high (78–85%). (2 tables.)

BEZBORODOV, M.A.

BEZBORODOV, M.A., prof., akademik.

Ceramics technology in the U.S.S.R. Stek. i ker. 14 no.11:25-28 N '57. (MIRA 10:12)

1. AN BSSR.

(Ceramics)

BEZBORODOV, M. A.

20-6-27/48

AUTHOR: Bezborodov, M.A., Member of the AN Belorussian SSR, Kachan, I.S.

TITLE: The Influence of Zirconium and Titanium on Some Properties of Silicate Glasses (Vliyaniye tsirkoniya i titana na nekotoryye svoystva silikatnykh stekol)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 115, Nr 6, pp. 1148 - 1151 (USSR)

ABSTRACT: Special interest was in recent publications dedecated to glass which contains the above-mentioned elements. Every one of those imparts characteristic properties to the glass: resistance to crystallization, to chemical reagents, increased refraction of light etc. In individual cases the influence of these elements is not the same, however, and depends on the composition of the glass-like system and on the quantitative content of these elements in it. The study of individual systems of this type makes it possible to determine separately their behavior in the systems, as well as their influence on the properties of glass. The present paper describes the experimental work done in the study of the part played by Tl and Zr, when they are simultaneously introduced into silicate glasses. It was assumed that the introduction of Zr to some titanium-silicate-glasses would re-

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The Influence of Zirconium and Titanium on Some Properties of Silicate Glasses

duce their property of crystallization without causing an essential modification of their refraction of light. The replacement of TiO_2 by ZrO_2 was carried out by weight from 1 % to 100%. Only 66 of 94 compositions became glas-like. The crystallizability gradually decreases with a decrease in the content of TiO_2 in the glass and with the increase in silica, when the content of the other components stays constant. A comparison of glasses from different series with an equal content of ZrO_2 shows that the crystallizability is the higher the more TiO_2 and the less silica are contained in it. The lowest crystallizability was found in glasses with an average ZrO_2-content (about 7 - 10%). The replacement of Ti by Zr at first reduces this ability, but then again increases it. The highest stability of the glasslike state in the system SiTiZrNa when Si $>$ 60 % is observed, when the content of CaO and Na_2O is constant. The chemical stability: water-resistance little changes. Soda-resistance. It is reduced on replacement of TiO_2 by silica, it is increased on replacement of TiO by ZrO (when the SiO_2-content is constant). Acid resistance. Shows the opposite tendency of soda-resistance. Refraction of light. In completely crystal-free glasses it was determined by the immersion method. It decreases with increasing content

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The Influence of Zirconium and Titanium on Some Properties of Silicate Glasses

of silica. Thermal expansion. It was measured between 30 and 400°C in 1,5 - 2,0 mm thick bars. The average coefficients very only little with a modification of content of the individual elements in glass. The fusing temperature is increased by introduction of ZrO_2. It varies between 600 and 650°C. The best composition of all glasses tested was: 55 SiO_2.12-13 TiO_2. 8-7 ZrO_2. 10 CaO. 15 Na_2O; refraction of light 1,62. It can be recommended as initial recipe for the production of utensils of better quality. There are 4 figures and 14 Slavic references.

ASSOCIATION: Belorussian Polytechnical Institute, Minsk
(Belorusskiy politekhnicheskiy institut, g. Minsk)

SUBMITTED: December 19, 1956

AVAILABLE: Library of Congress

Card 3/3

BEZBORODOV, M.A.

AUTHORS: Bezborodov, M. A., Member of the AN of the Belorussian SSR, and Bobkova, N. M. 20-4-34/52

TITLE: The Influence of Caesium on the Refraction of Light by Silicate Glass(Vliyaniye tseziya na svetoprelomleniye silikatnykh stekol)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 4, pp. 652-655 (USSR)

ABSTRACT: The behavior of caesium in glass can be interesting due to its position in the periodic law where it has a special position. It has the greatest ion radius and basic properties which are marked to the greatest extent. The properties of glass-like, casesium containing systems was inspite of this not investigated systematically. In present paper a part of such an experiment which is carried out in the scientific research laboratory of the instute (see association) is discussed. Three systems were investigated in glass-like state: I. Cs_2O - SiO_2; II. Cs_2O - CaO-SiO_2 and III. Cs_2O - Na_2O - Al_2O_3. Simultaneously with the system I) glasses: Li_2O - SiO_2, Na_2O - SiO_2 and K_2O - SiO_2 were synthetized in which the alkaline component was introduced in equimolar quantities with Cs_2O. Figure 1 shows that: 1) the refraction index of the 2-component-silicate-glasses increases with increasing Cs_2O-content; 2) the caesium-silicate-glasses have a higher refraction index than the lithium-, sodium-, and potassium glasses

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of equimolar composition; 3) the refraction of light of the 2-component-silicate-glasses decreases according to the content of the alkaline oxide in following order: Cs_2O - Li_2O - K_2O - Na_2O. In order to study the role of caesium in 3-component-glasses, the part of the diagram R_2O - CaO - SiO_2 was chosen which corresponds to the industrial compositions of sodium glasses. 4 series of glasses were synthetized: 1) Li_2O - CaO - SiO_2; 2) Na_2O-CaO-SiO_2; 3) K_2O - CaO - SiO_2 and 4) Cs_2O - CaO - SiO_2. In both series the refraction indices, determined by experiment, corresponded completely to those obtained according to the method of Appen (reference 4). The refraction of light decreases in the 3-component- glasses in following order: Li_2O - Na_2O - K_2O. It could be assumed that it will still decrease in the case of a substitution of K_2O by Cs_2O. The contrary was, however, the case. This phenomenon was effected by a deviating behavior of caesium in the glass. As the caesium ion belongs to the greatest cations and has simultaneously a small charge, it is obviously deformed in the glass. This influences considerably its behavior in the glass and the refraction of ligth of the latter. The refraction index increases with the caesium content so that caesium is to take the first place in the given order. At present the caesium salts are comparatively expensive components for the production

The Influence of Caesium on the Refraction of Light by Silicate Glass. 2o-4-34/51

of glass. Polucite -a natural mineral- was recommanded as substitutionsfor it. Its high refractoriness(circa 169o°)demands, however,easily fusible additions.This mineral and Na_2O were used for the synthetization of 4-component-glasses according to the system Cs_2-Na_2O-Al_2O_3-SiO_2.The choice of the compositions was limited by the bound state of the caesium oxide to Al_2O_3 and SiO_2. Therefore the Cs_2O-content of the alumina increased with the Tonerde. Actually the pollucite composition was exploited and N_2O added to such an extent as to obtain together with Al_2O_3 and SiO_2 of the pollucite a F'-eutectic.This glass is completely molten and gets clear already at 13oo°. Since the increased Na_2O-content is bound to lead to a reduction of the chemical power of resistance the N_2O-content was reduced in favor of SiO_2.The authors obtained by this method satisfactory glass at 135o°.Finally the partial number of the caesium oxide was computed for the refraction of light N_{Cs_2O} in glasses with 2,3,and 4 components. There are 4 figures and 6 references,3 of which are Slavic.

ASSOCIATION: Belorussian Polytechnical Institute, Minsk (Belorusskiy politekhnicheskiy institut, Minsk)

SUBMITTED: December 2o, 1956

AVAILABLE: Library of Congress

Card 3/3

BEZBORODOV, M.A.

5(1) PHASE I BOOK EXPLOITATION SOV/2451

Bezborodov, M. A., Academician, Academy of Sciences, BSSR, Professor, and N. M. Bobkova, Candidate of Technical Sciences

Vliyaniye tseziya na nekotoryye svoystva silikatnykh i bornykh stekol (Effect of Cesium on Some Properties of Silica and Boron Glasses) Minsk, Izd-vo "Zvyazda," 1958. 42 p. 1,000 copies printed.

Sponsoring Agency: Belorusskiy politekhnicheskiy institut. Nauchno-issledovatel'skaya laboratoriya silikatov i stekla.

Tech. Ed.: B. I. Bartman.

PURPOSE: This booklet is intended for chemists and technologists in glass manufacturing.

COVERAGE: This booklet investigates the role of cesium in glass and its influence on some properties of silica and boron glasses in the following systems: 1) Cs_2O-SiO_2, 2) Cs_2O-CaO-SiO_2, 3) Cs_2O-Na_2O-Al_2O_3-SiO_2, and 4) Cs_2O-PbO-B_2O_3. Data are

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given on molar and percentage compositions, cooking properties, crystallization properties, refractive indices, thermal expansion, infrared permittivity, and softening temperatures. No personalities are mentioned. There are 23 references: 14 Soviet, 7 English, and 2 German.

TABLE OF CONTENTS: None given. The booklet is divided as follows:

AVAILABLE: Library of Congress

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BEZBORODOV, M. A. Academician and I. A. KONOPEL'KO

"Crystallization Ability of Glass Synthesized on the Baseof Low-melting Clays of Belorussian SSR" p. 348

~~Synthesis and Structure of Hydrothermal and Complex Heavy Metal Silicates~~ p. 3

Transactions of the Fifth Conference on Experimental and Technical Mineralogy and Petrography. Izdat Nauka, Moscow, 1964, 400 pp. illus., biblio.

reprints of reports presented at conf. held in Leningrad, 4-8 Apr 1960. The purpose of the conf. was to exchange information and coordinate the activities in the fields of experimental and applied mineralogy and petrography, and to stress the increasing complexity of practical problems.

BEZBORODOV, M.A.

AUTHOR: Bezborodov, M.A., Professor, Member of the AS Belorussian SSR 72-2-9/20

TITLE: The Main Tasks to be Performed by a Laboratory for Silicate Problems of the Polytechnic Institute of Belorussia (Osnovnyye zadachi problemnoy silikatnoy laboratorii Belorusskogo politekhnicheskogo instituta).

PERIODICAL: Steklo i Keramika, 1958, Nr 2, pp. 24-26 (USSR)

ABSTRACT: This laboratory, which was organized in March 1957, is intended to elaborate and to solve problems of science and technical engineering. It is equipped with modern devices of home- and foreign origin. Among other things, an experimental plant for the synthesis of glass with furnaces of various constructions, purposes and efficiency has been installed. The author mentions 2 important problems of modern chemistry: the development of a theory of catalytic processes and the determination of the most perfect catalysts for individual chemical processes, the explanation of the rules governing the relation between molecule structure and the properties of the substance. It is known that hitherto no theory concerning the calculation of the properties and particle numbers for glass

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without silicon oxide has been developed. An important task is the synthesis and investigation of various physical and chemical properties of glass-like systems. The laboratory maintains close contact and collaborates with the laboratories of the professorial chairs of other institutes as well as with industrial organizations and construction offices. When working new types of glass it is recommended to apply the method of using the eutecticum as initial glass.

AVAILABLE: Library of Congress

Card 2/2

BEZBORODOV, M.A. [Bezbarodau, M.A.], akademik; PETROV, L.K. [Piatrou, L.K.], kand.tekhn.nauk; GRISHINA, N.P. [Gryshyna, N.P.], kand. tekhn.nauk

Composition of gases found in Keramizit pores and effect of additives on clay swelling. Vestsi AN BSSR. Ser. fiz.-tekhn. nav. No.2:48-60 '58. (MIRA 11:10)

1. AN BSSR (for Bezborodov)
(Keramzit--Testing)

AUTHORS: Bezborodov, M. A., Kachan, I. S. SOV/156-58-3-44/52

TITLE: The Optical Refraction of Titanium-Zirconium Silicate Glass (Svetopreloml eniye titano-tsirkoniyevykh silikatnykh stekol)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya 1958, Nr 3, pp. 572-575 (USSR)

ABSTRACT: Titanium-zirconium silicate glass was investigated by measuring its optical refraction. The determination of the optical refraction was carried out by means of the immersion method. The results obtained showed that in the mutual exchange of SiO_2 in glass with ZrO_2, and ZrO_2 with TiO_2 an increase in the optical refraction takes place. In the exchange of one part by weight of SiO_2 with TiO_2 n_D increases to 0,0064, in the exchange of ZrO_2 with TiO_2 n_D amounts to 0,0020. The partial quantity of ZrO_2 for the optical refraction N_{TiO_2} = 2,170 was proved. The quantitative dependence of the partial quantity TiO_2 for the

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SOV/156-58-3-44/52

The Optical Refraction of Titanium-Zirconium Silicate Glass

optical refraction index upon the content of SiO_2 in silicate glass was shown. The following empirical formula was suggested for $\bar{N}_{TiO_2}$ in zirconium silicate glass: $\bar{N}_{TiO_2} = 2,25 - 0,0035 (A-50)$, where A denotes the SiO_2 content in mole%. There are 3 figures and 15 references, 12 of which are Soviet.

ASSOCIATION: Kafedra silikatov i stekla Belorusskogo politekhnicheskogo instituta (Chair for the Silicates and Glass at the Belorussian Polytechnical Institute)

SUBMITTED: December 20, 1957

Card 2/2

BEZBORODOV, M.A., akademik; MARINOV, M.R., dots. (Sofiya)

Chemical and technological study of glass from the old Bulgarian capitols of Pliska and Preslav (IX - XIII centuries). Vestsi AN BSSR. Ser.fiz.-tekh.nav. no.4:72-81 '58. (MIRA 12:4)

1. AN BSSR (for Bezborodov).
(Bulgaria--Glass)

AUTHORS: Bezborodov, M. A., Yermolenko, N. N. SOV/156-58-4-41/49

TITLE: Synthesis and Investigations of Properties of Highly Refractive Zirconium-Barium Glasses (Sintez i issledovaniye svoystv vysokopreломlyayushchikh tsirkoniyevo-bariyevykh stekol)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 768-772 (USSR)

ABSTRACT: In the present paper the synthesis of new highly refractive glasses was investigated on the basis of zirconium oxide and barium oxide. For the synthesis of the experimental glasses the phase diagram of the system Na_2O - BaO - SiO_2 was taken, into which an increasing quantity of zirconium dioxide was introduced instead of SiO_2. The maximum content of ZrO_2 is 24%. The light refraction of the glasses increases with the increase of the zirconium- and barium oxide content of the glasses. The crystallizability of the glasses was investigated and it was found that glasses containing 8-16% of zirconium dioxide are the most resistant to crystallization. Laboratory experiments were carried out with the addition of CaO and K_2O. The glasses were investigated as to the following properties:

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Synthesis and Investigations of Properties of Highly Refractive Zirconium-Barium Glasses

crystallizability, refractive index, chemical stability, softening temperature, and thermal expansion. The following zirconium-barium glasses were suggested for the use in industry: Nr 3/IV - (SiO_2 - 46%; ZrO_2 - 13%; BaO - 20%; CaO - 6%; Na_2O - 13%; K_2O - 2%), with refractive index 1.601. Nr 4/V - (SiO_2 - 52%; ZrO_2 - 13%; BaO - 9%; CaO - 11%; Na_2O - 12%; K_2O - 3%) with refractive index 1.592.

There are 4 figures, 2 tables, and 15 references, 12 of which are Soviet.

ASSOCIATION: Kafedra tekhnologii stekla i silikatov Belorusskogo politekhnicheskogo instituta (Chair of Technology for Glass and Silicates at the Belorussian Polytechnical Institute)

SUBMITTED: April 15, 1958

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205130010-9"

AUTHOR: Bezborodov, M. A., Member, Academy of Sciences, Belorussian SSR SOV/72-58-11-4/15

TITLE: Synthesis of New Glasses as a Result of Research on Glassy Systems (Sintez novykh stekol na osnove izucheniya stekloobraznykh sistem)

PERIODICAL: Steklo i keramika, 1958, Nr 11, pp 7 - 12 (USSR)

ABSTRACT: It is necessary that new synthetic glassy materials with the following properties be produced: stability in high temperatures and high resistance toward corrosion by various chemical reagents; a very small specific weight and a very high mechanical durability; stability toward short-wave and cosmic radiation. Glass which will permit the penetration of infra-red rays of various wave lengths will also be required. The creation of new kinds of glass is closely related to the development of the physical chemistry of inorganic materials in the glassy state. Nauchno-issledovatel'skaya (problemnaya) laboratoriya stekla i silikatov Belorusskogo politekhnicheskogo instituta (the Scientific Research Laboratory (For Special Problems) of glass and Silicates of the Belorussian Polytechnical Institute) in

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cooperation with the laboratoriya fizicheskoy khimii silikatov Akademii nauk BSSR (Laboratory of Physical Silicate Chemistry AS BSSR) completed the papers for the publication of the monograph "Diagrams of Glassy Systems". Figures 1 through 5 indicate the present extent of our knowledge of the properties of various glassy systems. Figure 6 gives a list of the glassy systems which have been investigated. I. I. Kitaygorodskiy, T. N. Keshishyan, and Ye. A. Faynberg recently published their results on the investigation of the system $BaO-Al_2O_3-B_2O_3-SiO_2$. M. A. Bezborodov and V. A. Ulazovskiy carried out the synthesis of the glass systems $Li_2O-Al_2O_3-B_2O_3-SiO_2$. S. M. Brekhovskikh investigated the system $PbO-Bi_2O_3-SiO_2$, and M. A. Bezborodov and N. M. Bobkova investigated the system $Cs_2O-PbO-B_2O_3$. The continuous research on various kinds of new glasses is of great importance for the development of the chemistry of glass and the production of new glasses. There are 6 figures.

BEZBORODOV, M.

TECHNOLOGY

Periodicals KHIMIIA I INDUSTRIIA Vol. 30, no. 6, 1958

BEZBORODOV, M. Contemporary problems of glass research; synthesis of new glass on the basis of the study of glass-forming systems. Tr. from the Russian. p. 169.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 5, May 1959, Unclass.

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SOV/81-59-22-79300

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 22, p 344 (USSR)

AUTHORS: Bezborodov, M.A., Vil'dflush, R.T.

TITLE: An Experience of the Synthesis of Chemically Resistant Multi-Component Glass

PERIODICAL: Sb. nauchn. rabot. Belorussk. politekhn. in-t, 1958, Nr 63, pp 3 - 15

ABSTRACT: In the present work the methods of the synthesis of glass applied by M.V. Lomonosov, V. Ye. Tishchenko and others have been developed: the method of "addition". For the synthesis of glass the following components were taken: SiO_2, ZrO_2, Al_2O_3, CaO, BaO, K_2O, Na_2O. The method of developing the new types of glass by means of their gradual synthesis and the transition from the less complex to the more complex, from the three-component to the seven-component glass, has been described. It has been shown that the effect of Al_2O_3 on the increase of the chemical resistance of the investigated glass, especially against the action of H_2O and n/10 Na_2CO_3 is more efficient than the action of ZrO_2. The given method of synthesizing a complex multi-component glass has been tested by experiment on the example of developing chemically

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An Experience of the Synthesis of Chemically Resistant Multi-Component Glass

resistant seven-component glass types. It makes possible developing any glass types with prescribed properties. Glass types of the following composition(in %) are recommended for production: Nr 141 SiO_2 68.64, CaO 7.35, BaO 7.35, K_2O 7.35, Na_2O 7.35, Al_2O_3 0.98, ZrO_2 0.98; Nr 142 SiO_2 67.96, CaO 7.35, BaO 7.28, K_2O 7.28, Na_2O 7.3, Al_2O_3 1.45, ZrO_2 1.45.

I. Mikhaylova

Card 2/2

BEZBORODOV, M.A., akademik, prof.; MAZELEV, L.Ya., kand.tekhn.nauk, dots.

Methods of checking the quality of glass containers. Sbor.nauch. rab.Bel.politekh.inst. no.63:41-52 '58. (MIRA 12:4)

1. AN BSSR (for Bezborodov)
(Glass containers)

BEZBORODOV, M.A., akademik, prof.; ZHUNINA, L.A., kand.tekhn.nauk, dots.; GUBSKIY, G.Z., inzh.

Optimum conditions for agglomerating of batches of sheet glass. Sbor.nauch.rab.Bel.politekh.inst. no.63:63-74 (MIRA 12:4)

1. AN BSSR (for Bezborodov)
(Glass manufacture)

BEZBORODOV, M.A., akademik, prof.; MAZELEV, L.Ya., kand.tekhn.nauk, dots.; ZELINSKIY, A.I., kand.tekhn.nauk, dots.

Developing formulas for colored glasses for mozaics using fluorine opacifiers. Sbor.nauch.rab.Bel.politekh.inst. no.63: 95-104 '58. (MIRA 12:4)
(Glass manufacture)

BESBORODOV, M. A. (Minsk)

"Methods of the Identification of Stones and Cords in Glass."
"Glass Manufacturing in East and Middle Europe in Antiquity and in the Early Middle Ages."

report to be submitted at 5th Intl. Congress on Glass, Intl Commission on (ICG). Munich, Germany, 29 Jun to 4 Jul 59.

BEZBORODOV, M.A., prof., akademik; YERMOLENKO, N.N., kand.tekhn.nauk; KAPRANOVA, N.V., red.

[Zirconium-barium glass] TSirkonievo-bariovye stekla. Minsk, Redaktsionno-izdatel'skii otdel BPI im. I.V.Stalina, 1959. 32 p. (MIRA 13:1)

1. AN BSSR (for Bezborodov).
(Glass)

PHASE I BOOK EXPLOITATION SOV/3763

Bezborodov, M.A., N.M. Bobkova, S.M. Brekhovskikh, N.N. Yermolenko, E.E. Mazo, and Ye. A. Poray-Koshits

Diagrammy stekloobraznykh sistem (Diagrams of Vitriform Systems) Minsk, Redaktsionno-izdatel'skiy otdel BPI imeni I.V. Stalina, 1959. 313 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agencies: Minsk. Belorusskiy politekhnicheskiy institut. and BSSR. Ministerstvo vysshego, srednego spetsial'nogo i professional'nogo obrazovaniya.

Ed. (Title page): M.A. Bezborodov, Academician, BSSR Academy of Sciences, Doctor of Technical Sciences; Ed. (Inside book): N.V. Kapranova; Tech. Ed.: P.T. Kuz'menok.

PURPOSE: This book is intended for chemists, scientists, and engineers dealing with vitriform systems.

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Diagram of Vitriform Systems SOV/3763

COVERAGE: The materials contained in this book on vitriform systems were compiled by the Scientific Research Laboratory of Glass and Silicates of the Belorussian Polytechnic Institute and the Laboratory of the Physical Chemistry of Silicates of the Belorussian Academy of Sciences. The book surveys all literature on the properties of vitriform systems available up to 1958. All vitriform systems are presented with "composition-property" diagrams. Figures 1 through 5 provide a graphic summary of the present state of knowledge of the properties of various vitriform systems. The systems are presented diagrammatically in increasing order of complexity. One-component to eight-component systems are treated. This survey shows that to date 177 systems have been studied and 568 "composition-property" diagrams have been constructed. Chapter I was written by Ye.A. Poray-Koshits. References accompany individual chapters.

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JA/dwm/gmp
7-26-60

BEZBORODOV, M.A. [Bezbarodau, M.A.], akademik; MAZO, E.E., kand. tekhn.nauk; GRISHINA, N.P. [Gryshyna, N.P.], kand. tekhn. nauk; KAMINSKAYA, V.S. [Kaminskaia, V.S.], inzh.

Studying some properties of K_2O - PbO - B_2O_3 - SiO_2 glass as a base for enamels on aluminum. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.1:53-57 '59. (MIRA 12:6)

1.AN BSSR (for Bezborodov).
(Glass) (Enamel and enameling)

BEZBORODOV, M.A., akademik

Second youth of an old material. IUn.tekh. 2 no.8:15-16 Ag '59. (MIRA 12:7)

1. AN BSSR.
(Glass)

BEZBORODOV, M.A., [Bezbarodau, M.A.], akademik; KHODSKIY, L.G. [Khodski, L.H.], inzh.

Properties of K_2O—PbO—Al_2O_3 glass. Vestsi AN BSSR. Ser.fiz-tekh. nav. no.3:42-49 '59. (MIRA 13:3)

1. AN BSSR.

(Glass)

BEZBORODOV, M.A., akademik; MAZO, E.E., kand.tekhn.nauk; GRISHINA, N.P., kand.tekhn.nauk; KAMINSKAYA, V.S., inzh.

Some properties of glasses of the system K_2O - Al_2O_3 - B_2O_3 - P_2O_5. Dokl.AN BSSR 3 no.2:52-55 F '59. (MIRA 12:5)

1. AN BSSR (for Bezborodov)
(Glass)

BEZBORODOV, M.A.; MEL'NIK, M.T.

Some properties of PbO - Al_2O_3 - SiO_2 glasses. Dokl. AN BSSR 3 no.8: 338-340 Ag '59. (MIRA 12:11)

(Glass)

Distr: 4E2c/4E2c(j)

Glass systems as enamels for aluminum. Michail A. Bezborodov. *Zergakademie* 11, 466-71(1950).—Ternary and quaternary systems were examd. for the formation, thermal expansion, and chem. resistance of the glasses. All compns. (mole %) were heated to a max. temp. of 1300°. Thermal expansions were measured between 20° and 200°, and the chem. resistance to H_2O and HCl was detd. by wt. loss. The system K_2O–B_2O_3–P_2O_5 yielded glasses with fusion temps. in the range 700–1300°; the lowest melting (700–800°) contained K_2O 40. The thermal expansion increased with increasing K_2O content. Wt. loss on H_2O treatment was 70–98%. Three compns., contg. Al_2O_3 10–20, B_2O_3 10–20, and P_2O_5 70–80, yielded glasses in the system Al_2O_3–B_2O_3–P_2O_5, which had a melt temp. of approx. 1300° and good chem. resistance. A study of the system K_2O–Al_2O_3–B_2O_3–P_2O_5 (I) was made. Compns. in the ranges K_2O 20–45, B_2O_3 5–30, P_2O_5 35–55, and Al_2O_3 5 yielded glasses with fusion temps. which decreased (from 1200° to 900°) and thermal expansion coeffs. which increased with increasing K_2O content. H_2O treatment caused a 40–90% wt. loss. Increasing the Al_2O_3 in I to 10% increased the fusion temps. (1100–1200°) and decreased the wt. loss (36.6–40.7%) on H_2O treatment. Compns. in the ranges K_2O 5–40, B_2O_3 5–35, P_2O_5 30–60, and Al_2O_3 15 caused regions of infusibility, crystn., and glass formation. The wt. loss (0.2–0.36%) was at a min. in glasses with high P_2O_5 and low K_2O content. The thermal expansion of these glasses was high. Increasing the Al_2O_3 in I to 20% caused glass formation at high K_2O (30–35); the glasses had high fusion temps. (1300°) and good H_2O resistance. Glasses from the systems K_2O–PbO–B_2O_3 (II), K_2O–B_2O_3–SiO_2 (III), and PbO–B_2O_3–SiO_2 (IV) had low fusion temps., good H_2O resistance, and low thermal expansion coeffs. The fusion temp. of the glasses from the system K_2O–PbO–SiO_2 (V) was higher than those of II, III, and IV. The effect of B_2O_3 on V at low K_2O content (10–20) was studied. Glasses from V with B_2O_3 10 and K_2O 10–15 had low expansion coeffs. and good H_2O resistance (wt. loss of 0.03–0.17%). The expansion coeffs. decreased with increasing SiO_2 content, and the fusion temps., which decreased with increasing K_2O content, were in the range 900–1300°. In a study of the glasses from V with B_2O_3 20, the optimum compn. for an enamel on Al was found at K_2O 15, PbO 35, SiO_2 30, and B_2O_3 20. Glasses from V contg. B_2O_3 30 had higher expansion coeffs., higher fusion temps., and lower H_2O resistance than these contg. B_2O_3 10 and 20.

Gabriel DeTommaso

BEZBORODOV, M.A.; RZHEVUSKAYA, T.L.

Lithium-lead-silicon glass. Dokl.AN BSSR 3 no.12:488-491
D '59. (MIRA 13:4)
(Glass)

BEZBORODOV, M.A.; MAZO, E.E.; GRISHINA, N.P.; KAMINSKAYA, V.S.

Enamels for aluminum. Dokl. AN BSSR 3 no.7:300-302 Jl '59.
(MIRA 12:11)

(Enamel and enameling) (Aluminum)

15(2) SOV/72-59-10-3/14

AUTHOR: Bezborodov, M. A., Academician of the Belorussian SSR

TITLE: The Influence of Some Small Additions on Glass Melting. From the Report Delivered at the Second Conference of the Officials of Glass Industry of the Belorussian SSR in June 1959

PERIODICAL: Steklo i keramika, 1959, Nr 10, pp 7 - 9 (USSR)

ABSTRACT: The author describes here the role played by two glass-melting accelerators: sodium chloride, and ammonium sulphate. Some years ago, M. A. Bezborodov and A. M. Shumilin (Footnote 1) experimented on the role played by sodium chloride in glass-melting at the Scientific Research Laboratory for Glass and Silicates of the Belorussian Polytechnic Institute. Thermal analysis, microscopic examination, and the method of determining the weight loss during heating were applied for studying the processes of vitrification. A. G. Repa and Ye. P. Danil'-chenko (Footnote 2) showed by experiments that sodium bisilicate forms in the mixture $Na_2CO_3+SiO_2$, at excess of SiO_2. The influence of $Na_2CO_3+SiO_2+NaCl$ on the acceleration of vitrification is especially clear in the mixture NaCl. M. A. Bezborodov and L. A. Zhunina (Footnote 3) have already previously

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underlined the role played by the liquid phase of the charge in the acceleration of vitrification. The observations made by means of radioisotopes and the cone precipitator are summarized in a table. I. I. Kitaygorodskiy (Footnote 4) made experiments in the USSR with the addition of ammonium salts to the charge. A. I. Mochalov and Khomenko (Footnote 5) carried out experimental meltings in continuous glass-melting furnaces with an addition of 1-10% of $(NH_4)_2SO_4$ and established the positive role of ammonium sulphate. In 1936, M. A. Bezborodov and N. O. Abel'chuk (Footnote 6) made experiments on the investigation of physical and chemical phenomena occurring during the heating of a charge with the addition of $(NH_4)_2SO_4$. By introducing ammonium sulphate, the glass-melting process is accelerated since the surface of the liquid reactants is greatly enlarged, and the reaction takes place with the participation of the liquid phase at lower temperatures. There are 1 table and 9 references, 6 of which are Soviet.

BEZBORODOV, M. A.

PHASE I BOOK EXPLOITATION SOV/5035

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

Steklobraznoye 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-tekhnicheskiy 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 recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass), and to join the International Committee on Glass. 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.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205130010-9"

BEZBORODOV, M.A., akademik, prof., doktor tekhn.nauk; MAZELEV, L.Ya., dotsent, kand.tekhn.nauk; ZHUNINA, L.A., dotsent, kand.tekhn.nauk

Research work on the chemistry and technology of silicates in 1936-1956. Sbor.nauch.trud. Bel.politekh.inst. no.66:91-116 '57. (MIRA 16:9)

1. Akademiya nauk Belorusskoy SSR (for Bezborodov).

PHASE I BOOK EXPLOITATION SOV/4136

Minsk. Belorusskiy politekhnicheskiy institut

Khimiya i khimicheskaya tekhnologiya silikatnykh materialov (Chemistry and the Chemical Technology of Silicate Materials) Minsk, Red-izd. otdel BPI imeni I. V. Stalina, 1960. 165 p. (Series; Its: Sbornik nauchnykh trudov, vyp. 82) 1,000 copies printed.

Editorial Board: M. A. Bezborodov (Resp. Ed.) Academician, Academy of Sciences BSSR, L. A. Zhunina, Candidate of Technical Sciences, N. N. Yermolenko, Candidate of of Technical Sciences, P. F. Mikhalevich, Candidate of Technical Sciences; Resp. Ed. for this issue: L. A. Zhunina; Ed.: N. V. Kapranova; Tech. Ed.: P. T. Kuz'menok.

PURPOSE: This book is intended for chemists and technicians interested in the physicochemical properties and the production of glass.

COVERAGE: The collection contains 20 articles which give data on the synthesis and physicochemical properties of various widely used and some experimental glass compositions. Numerous property and phase diagrams of glass compositions are given. The apparent need to conserve boron, evidenced by the third article,

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may be noteworthy. No personalities are mentioned. References accompany some articles.

TABLE OF CONTENTS:

PORAY-KOSHITS, Ye.A., doktor fiz.-matem.nauk, red.; AVGUSTINIK, A.I., red.; BARZAKOVSKIY, V.P., red.; BEZBORODOV, M.A., red.; BOTVINKIN, O.K., red.; VARGIN, V.V., red.; VLASOV, A.G., red.; YEVSTROP'YEV, K.S., red.; LEBEDEV, A.A., akademik, red.; MATVEYEV, M.A., red.; MOLCHANOV, V.S., red.; MYULLER, R.L., doktor tekhn.nauk, red.; TOROPOV, N.A., red.; FLORINSKAYA, V.A., red.; YAKHKIND, A.K., red.; SUVOROV, I.V., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Vitreous state; transactions of the Third All Union Conference on the vitreous state] Stekloobraznoe sostoianie; trudy Vsesoiuznogo soveshchaniia po stekloobraznomu sostoianiiu. Moskva, Izd-vo Akad. nauk SSSR, 1960. 534 p. (MIRA 13:10)

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

(Glass--Congresses)

31971
S/081/61/000/023/040/061
B138/B101

15.2120

AUTHORS: Bezborodov, M. A., Mazo, E. E., Kaminskiy, V. S.

TITLE: The role of aluminum in aluminophosphate glasses

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 23, 1961, 341-342, abstract 23K267 (Sb. "Stekloobrazn. sostoyaniye", M.-L. AN SSSR, 1960, 441-444. Diskus., 446)

TEXT: The following six ternary, quarternary a i quinternary phosphate systems have been investigated: K_2O - PbO - P_2O_5, Al_2O_3 - B_2O_3 - P_2O_5, K_2O - Al_2O_3 - B_2O_3 - P_2O_5 (with 5, 10, 15, and 20% Al_2O_3), K_2O - Al_2O_3 - B_2O_3 - P_2O_5 - SiO_2 (with 15% K_2O, 20% B_2O_3), K_2O - PbO - Al_2O_3 - P_2O_5 - SiO_2 (PbO 10%, SiO_2 15%), K_2O - Al_2O_3 - P_2O_5. The glass formation ranges, thermal expansion and chemical stability of these systems were studied. In both the borophosphate silicic and lead phosphate silicic glasses, chemical stability was improved by the introduction of Al_2O_3. The chemical stability of glasses is very closely

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The role of aluminum in ...

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related to their structure and variations are directly connected with structural transformations. Experimental factors are explained from the viewpoint of the structure of the glass former P_2O_5. The introduction of tetrahedrons (SiO_4) into a phosphate glass skeleton is found to have a very much smaller effect than AlO_4. It suggested that TiO_2, BeO, ZrO, and ThO_2 should, in ascending order, have a positive influence in increasing the chemical stability of phosphate glasses. [Abstracter's note: Complete translation.]

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SOV/72-60-1-11/17

15(2)
AUTHORS: Bezborodov, M. A., Academician of the Academy of Sciences of the Belorusskaya SSR, Mazo, E. E., Kaminskaya, V. S.

TITLE: Enamels for Aluminum on the Basis of the Lead-phosphate-silicate System

PERIODICAL: Steklo i keramika, 1960, Nr 1, pp 35-39 (USSR)

ABSTRACT: The authors and N. P. Grishina had previously produced easily fusible glasses suitable as a basis of enamels for aluminum. They were, however, not resistant to 4% acetic acid. In the present paper, the authors describe a number of experiments to obtain mixed lead-phosphate-silicate enamels resistant to 4% acetic acid. They refer to papers by A. A. Appen and Gan Fu-Si, as well as K. P. Azarov and V. Ye. Gorbatenko. Figures 1 and 2 show the glass-formation ranges of the systems investigated. Table 1 indicates the chemical resistivity and coefficients of thermal expansion. Table 2 lists the compositions, table 3 the essential technological characteristics, and table 4 some technical properties of the enamels obtained. Table 3 presents the optimum enamel compositions (Nr 264 - white,

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Enamels for Aluminum on the Basis of the Lead-phosphate-silicate System

and Nr 257 - colored enamels) with a baking temperature of 540-580°. These enamels are resistant to 4% acetic acid, cold and boiling water. Heat dilatation of these enamels lies between 151.5 and 177.10^{-7}. There are 2 figures, 4 tables, and 6 references, 5 of which are Soviet.

BESBORODOV, M.A.; MEL'NIK, M.T.

Studying the system Na_2O - PbO - Al_2O_3 - SiO_2 in a vitreous state. Dokl.AN BSSR 4 no.1:11-14 Ja '60. (MIRA 13:6)

(Glass)

34960
S/713/60/000/001/004/005
D287/D503

15.2620

AUTHORS: Bezborodov, M.A., Kovtunenko, G.A., Volchek, L.K., Orlova, V.M. and Volkadatov, A.F.

TITLE: The effect of strontium and manganese on certain properties of glass

SOURCE: Akademiya nauk BSSR, Minsk. Institut obshchey i neorganicheskoy khimii. Sbornik nauchnykh rabot. no. 1, Minsk, 1960, 51 - 58

TEXT: The authors studied the effect of Sr and Mg on glasses not containing alkalis or borates, suitable for glass-fiber as well as the effect of large quantites of Fe. The founding and crystallization properties, chemical stability and processing characteristics of the system CaO - SrO - MnO_2 - Fe_2O_3 - SiO_2 were investigated and 102 types of glasses synthesized; the composition of these glasses varied within the following limits: SrO 0 - 45 %, CaO 45 - 0 %, MnO_2 14.5 - 0 %, Fe_2O_3 0 - 24.5 % and SiO_2 40.5 %. During experi-

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The effect of strontium and ...

ments on the founding properties of glass the authors used sand of the following composition: SiO_2 : 98.17 %; Al_2O_3 : 0.35 %; CaO : 0.45 %; MgO : 0.65 %; Fe_2O_3 : 0.07 %; SO_3 : 0.06 %; alkali : 0.02 %; the remaining components of the mixture were added as 'chemically pure' substances. The glasses were processed at 1440°C. Compositions containing ~ 25 % SrO and ~ 20 % CaO showed founding characteristics; these were affected adversely on increasing the CaO content (and correspondingly decreasing the SrO content) in the glass. Crystallization properties improved on decreasing the SrO content and simultaneously increasing the CaO. This same improvement was observed, but to a lesser degree, when increasing the Fe_2O_3 content at the expense of MnO_2. Chemical stability of the glasses was tested by determining the loss in weight of the initial powder sample on treatment with water, 0.1 or 2N Na_2CO_3, 0.02 or 2N NaOH, 0.02 or 2N H_2SO_4. All samples showed great stability to the aforementioned solutions except to H_2SO_4 where the stability increased on lowering the SrO content (and corres-

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pondingly decreasing the CaO content) in the glass. Tests on the drawing of glass fibers were carried out at 1420° C and it was found that compositions with a maximum content of SrO and MnO_2 and a minimum content of CaO and Fe_2O_3 showed the best drawing characteristics. The tensile strength of fibers decreased with increased Fe_2O_3 and decreased MnO_2 contents. There are 5 figures, 1 table and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: Chilas, Dimbleby, Winks and Turner, Journ. Soc. Glass Techn. no. 56, p. 172, (1951); Bumpei Toshiki: The Glass Industry, v. 35, no. 6 (1952)

Card 3/3

15.2141

26192
S/081/61/000/012/017/028
B110/B216

AUTHORS: Bezborodov, M. A., Mazo, E. E., Kaminskaya, V. S.

TITLE: Increased chemical resistance of enamels for aluminum

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1961, 396, abstract 12 K 372 (12K372)("Sb. nauchn. rabot. In-t obshch. i neorgan. khimii AN BSSR", 1960, no. 1, 59-71)

TEXT: Chemically resistant boron-free enamels containing no Li_2O were prepared. Optimum composition (in mole%): K_2O = 11.57; Na_2O = 12.46; PbO = 19.29; SiO_2 = 41.05; TiO_2 = 15.63. Grinding additives (in %): sodium metasilicate = 2; boric acid = 2; TiO_2 = 0.5-1.0; water = 27.5-28.3. Baking temperature 580°C; baking time of the enamel 5-10 min. The enamels may be used for the decoration of architectonic details, jewelry and as insulation on aluminum. By increasing the TiO_2 content to 25-32 mole% the authors obtained enamels with a higher resistance to

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B110/B216

Increased chemical resistance of ...

strong acids which indicates that the silicon-oxygen skeleton of the glass is strengthened by the incorporation of TiO_4 tetrahedrons.

[Abstracter's note: Complete translation.]

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S/081/61/000/012/019/028
B110/B216

AUTHORS: Bezborodov, M. A., Khodskiy, L. G.

TITLE: Lead phosphate enamels for aluminum

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1961, 396, abstract 12K374 (12K374)("Sb. nauchn. rabot. In-t obshch. i neorgan. khimii AN BSSR", 1960, no. I, 72-83)

TEXT: The authors studied the range of compositions of the system $K_2O + PbO + Al_2O_3 + B_2O_3 + P_2O_5$ characterized by low softening point (414-425°C) high thermal expansion coefficient ($132-156.3 \cdot 10^{-7}$) and resistance to boiling water with a view to preparing enamels suitable for aluminum. The following property changes with composition were determined for this system: Thermal expansion, density, and temperature at which softening begins. A series of white enamels with properties rendering them suitable for decorative coatings were prepared on the basis of a glass of the composition (in mole%): K_2O = 20; PbO = 30; Al_2O_3 = 15; B_2O_3 = 10; P_2O_5 = 25. [Abstracter's note: Complete translation.]

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26193
S/081/61/000/012/018/028
B110/B216

15.2141

AUTHORS: Bezborodov, M. A., Grishina, N. P.

TITLE: Boron-free phosphate enamels for aluminum

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1961, 396 abstract 12K373 (12K373)("Sb. nauchn. rabot. In-t obshch. i neorgan. khimii AN BSSR", 1960, no. I, 91-98)

TEXT: An easily fusible phosphate-strontium enamel with an annealing temperature of 400°C and the following composition (in mole%) was developed: K_2O = 4.2; Na_2O = 21.5; NaF = 20.8; SrO = 8.4; Al_2O_3 = 12.5; P_2O_5 = 32.6. Enamels with a colored polish were obtained by using Cr_2O_3 and Fe_2O_3 as pigment additives, and boron-free white enamels by using grinding additives consisting of 1-2% of $NaNO_2$ + 8% of TiO_2 + 3% of MoO_3. The enamels showed a thermal expansion coefficient of 143-164·10^{-7}, and a melting range of 200-260°C; the temperature at which softening was completed was 600-820°C. The phosphate enamels obtained were resistant to

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Boron-free phosphate enamels ...

cold and hot water, 4% CH_3COOH and even to cold 5% soda solution.
[Abstracter's note: Complete translation.]

Card 2/2

BEZBORODOV, M.A. [Bezbarodau, M.A.], akademik; RZHEVSKAYA, T.L. [Rzhevuskaia, T.L.], inzh.

Studying some types of LiNaPbSiO glass as a base for enamel on aluminum. Vestsi AN BSSR. Ser.fiz.-tekh.nav. no.1:57-61 '60. (MIRA 13:6)

1. AN BSSR (for Bezborodov).
(Enamels and enameling) (Glass)

15.2141

26194
S/081/61/000/012/020/028
B110/B216

AUTHORS: Bezborodov, M. A., Grishina, N. P.

TITLE: Aluminum-boron-phosphate enamels for aluminum

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1961, 396, abstract 12K375 (12K375)("Sb. nauchn. rabot. In-t obshch. i neorgan. khimii AN BSSR", 1960, no. I, 99-111)

TEXT: Colored and white phosphate enamels were prepared, which gave good bonding with aluminum. The enamels no. 119 and 122 proved to be suited best. Their compositions (in % by weight) were: K_2O = 2.9; 3.9; Na_2O = 13.2; 13.2; Li_2O = 3.9; 2.9; NaF = 4.4; 5.4; Al_2O_3 = 12.2; 12.2; B_2O_3 = 8.4; 8.4; P_2O_5 = 44.4; 44.4; TiO_2 = 7.2; 6.7; Sb_2O_3 = 3.4; 0 ZnO = 0; 2.9. To improve bonding of the enamel to the metal it is recommended to add 8-10% TiO_2, or 6-8% CuO, or 5-6% MoO_3 to the charge. The authors studied the optimum composition of the grinding additives and the various methods for treating the surface of the metal. Chemical

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