"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

Zhdanov, S.P.

20-5-24/54

AUTHOR: Zhdanov, S.P.

TITLE: The Adsorption of Water on Quartz which was Ground in a Vacuum (Adsorbtsiya vody na kvartse, droblennom v vakuume)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 5, pp. 938-941 (USSR)

ABSTRACT: It is a known fact that under ordinary conditions the surfaces of silica particles, no matter whether in a crystalline or amorphous state, is hydrated and has OH groups which are valence-connected with the surface atoms of the silicon. In the case of adsorption investigations carried out in SiO_2, a more or less hydrated surface is therefore found to exist. A more or less complete surface dehydration can be attained only by annealing at 1100 - 1200°, which, in turn, may not only considerably modify the surface structure, but may also lead to a complete disappearance of the developed interior surface. In the present paper the results of investigations, as mentioned in the title, which were obtained by the grinding of low-temperature α-quartz in a vacuum are dealt with; further, the adsorption properties of the SiO_2 surfaces obtained at various conditions are compar-

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The Adsorption of Water on Quartz which was Ground in a Vacuum 20-5-24/54

ed in relation to steam. The presence of charges of unsaturated valences on the surface of the α-quartz crushed in the vacuum forms one of the basic properties of this surface, by which structure it is distinguished from the surface structure of silica obtained by annealing. Probably the high activity of the said surface with respect to the adsorption of polar water molecules is in conncetion with just this property. It even exceeds the activity of a most highly hydrated hydrophile quartz surface (curve 1, fig. 2). As, however, may be seen from a comparison of the isotherms 1 and 4 (fig. 2) the surface unit activity of α-quartz at low vapor stresses only little surpasses the activity of a hydrated surface. This indicates that the numbers of primary adsorption centers per surface unit are in both cases very close to each other. A considerable increase of adsorption with increasing steam pressure is in the former case already at the first initial section of the isotherm in connection with the overlapping by chemical absorption which was caused by hydration. The formation of charges on freshly formed mica surfaces on the occasion of its being crushed in a vacuum was observed by Obreimov. There are 3 figures and 6 Slavic references.

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20-5-24/54

The Adsorption of Water on Quartz which was Ground in a Vacuum

PRESENTED BY: M.M. Dubinin, Academician, March 21, 1957

SUBMITTED: March 20, 1957

AVAILABLE: Library of Congress

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APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

AUTHOR: Zhdanov, S. P.

76-32-3-32/43

TITLE: Discussions (Diskussiya). On the Part Played by the Surface Hydroxyl Groups of Porous Glass in the Adsorption of Water (K voprosu o roli poverkhnostnykh gidroksil'nykh grupp poristogo stekla v adsorbtsii vody). On the Occasion of Some Remarks Given in the Article by V. A. Nikitin, A. N. Sidorov and A. V. Karyakin (Po povodu nekotorykh vyvodov, sdelannykh v stat'ye V. A. Nikitina, A. N. Sidorova i A. V. Karyakina)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol 32, Nr 3, pp 699-706 (USSR)

ABSTRACT: It was determined that the water adsorption on porous glass depends on the temperature of the preceeding annealing of the adsorbent in a vacuum. The most intensive decrease in adsorption was observed in annealings in the temperature interval of 300-500°C, where the most intensive separation of water also takes place, whereas at higher temperatures the nature of the adsorption isotherms changes. These and other observations lead to the assumptions

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Discussions. On the Part Played by the Surface Hydroxyl Groups of Porous Glass in the Adsorption of Water. On the Occasion of Some Remarks Given in the Article by V. A. Nikitin, A. N. Sidorov and A. V. Karyakin

76-32-3-32/43

that the adsorbing capacity is to be sought in connection with the hydroxyl groups at the surface, that a decrease in adsorption consequently corresponds to a dehydration. [illegible] The results of investigation are agreement with the data of infrared spectra of the valence oscillations of the OH groups according to N. G. Yaroslavskiy (References 5-7). The results of later investigations and those by the author mentioned in the title (Reference 1) are in contrast with the above-mentioned assumptions, which is apparently due to an insufficient interpretation of the spectral bands. The [illegible] examinations lead to the conclusion that up to 200°C a separation of the adsorbed water takes place, and that above 200°C the structural water is separated. Thus Shapiro and Weiss (Reference 12), in the reaction of diborane with surface hydroxyl groups of silica gel, noticed that at temperatures above 150°C in a vacuum, only a forma-

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Discussions. On the Part Played by the Surface Hydroxyl Groups of Porous Glass in the Adsorption of Water. On the Occasion of Some Remarks Given in the Article by V. A. Nikitin, A. N. Sidorov and A. V. Karyakin 76-32-3-32/43

tion of water from structure hydroxyl groups can take place. A table of the quantity of hydroxyl/m^2 of the SiO_2 surface at different annealing temperatures is given. Explanations in connection with the spectrum and formulae of structure are given. On the basis of the performed considerations and observations of diagrams a surface structure is assumed in which every water molecule in the adsorption is connected with two hydroxyl groups. By this concept, the above-mentioned differences of the results can be explained. In this connection, the change and not the decrease of the surface is emphasized. There are 4 figures and 15 references, 12 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimii silikatov, Leningrad (Leningrad, AS USSR, Institute of Silicate Chemistry)

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Discussions. On the Part Played by the Surface Hydroxyl Groups of Porous Glass in the Adsorption of Water. On the Occasion of Some Remarks Given in the Article by V. A. Nikitin, A. N. Sidorov and A. V. Karyakin

76-32-3-32/43

SUBMITTED: June 28, 1957

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

5(4)

AUTHOR: Zhdanov, S. P. SOV/20-123-4-40/53

TITLE: On the Dehydration and Rehydration of the Surface of Quartz (O degidratatsii i regidratatsii poverkhnosti kvartsa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 716-719 (USSR)

ABSTRACT: The present paper deals with the dehydration of pulverulent opaque quartz($s = 5.4\ m^2/g$) and rock crystal ($s = 0.58\ m^2/g$) as also with the rehydration of the surface of rock crystal after annealing at 1150°. The author compared the adsorption properties of the initial (maximum hydrated), of the maximum dehydrated and of the rehydrated surfaces of rock crystal with respect to the adsorption of steam. Carrying out of measurements is described in short. The apparatus for the investigation of dehydration also permitted qualitative determination of the hydrogen separated during annealing. A diagram shows the curves for the dehydration of quartz samples of maximum hydrated surface. The quantity of water separated by annealing varies in the case of different quartz samples within very wide limits. (However, by the annealing of silica gel the structural water content varies only very little).

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On the Dehydration and Rehydration of the Surface of Quartz SOV/20-123-4-40/53

The aforementioned differences in the quantity of separated water cannot be due to differences in the degree of hydration of the surface of the quartz samples. A possible existence of free (molecular) water in the quartz crystals is not quite impossible. This water may accumulate in very fine cracks or may be otherwise adsorbed or it may be present in the crystal lattice itself in form of a solid solution. Thus, the steep rise of the dehydration curves in the temperature interval of 100-200° may be due to the separation of the water irreversibly adsorbed in very fine cracks of molecular dimensions. Further possibilities of explaining the course taken by these curves are discussed. According to the results of the present paper the quantity of hydroxides occurring on the quartz surface can be derived only with great caution from the data on thermal dehydration. Further investigations of the here discussed phenomena appear advisable. The author thanks M. M. Dubinin and A. V. Kiselev for the interest they displayed in this work, and Ye. V. Koromal'di for assisting him in carrying out measurements. There are 3 figures and 8 references, 5 of which are Soviet.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

On the Dehydration and Rehydration of the Surface of Quartz SOV/20-123-4-40/53

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute for the Chemistry of Silicates of the Academy of Sciences, USSR)

PRESENTED: July 11, 1958, by M. M. Dubinin, Academician

SUBMITTED: July 10, 1958

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Zhdanov, S.P.

SIDOROV, A.N.; NIKITIN, V.A.

Reply on the paper "The part played by the surface hydroxyl groups of porous glass in the adsorption of water" by S.P. Zhdanov. Zhur. fiz. khim. 32 no.7:1667-1668 Jl '58. (MIRA 11:9)
(Hydroxyl group) (Glass) (Water) (Zhdanov, S.P.)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

AUTHOR: Zhdanov, S. P.

SOV/20-120-1-27/63

TITLE: The Reversible Isothermal Lines of the Adsorption of Water on Quartz (Obratimyye izotermy adsorbtsii vody na kvartse)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 1, pp. 103 - 106 (USSR)

ABSTRACT: The adsorption of steam on quartz was investigated among others in 3 previous papers (Refs 1-3) by the authors. The isothermal lines determined for the adsorption of water are shown in a diagram in this paper. Although the adsorption was in all 3 cases related to the unit of quartz surface the isothermal lines differ substantially beginning with considerably high values of the relative pressure p/p_s.

The present paper reports on the results of the investigation of the adsorption of steam on 4 samples of different quartz powders with different specific surface and of different origin. Three of the samples were produced by crushing rock crystal of different origin with subsequent treatment of the powder with HCl. The fourth, finest powder was produced of crystals of unpolarized quartz. The specific surfaces were

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The Reversible Isothermal Lines of the Adsorption of Water on Quartz

SOV/20-120-1-27/63

produced according to Brunauer, Emmett and Teller from the isothermal lines of the adsorption of nitrogen, argon and methylalcohol. The isothermal lines of the adsorption of steam determined by the volume method are compiled in a table. All these isothermal lines are reversible, with one single exception. The properties of the surface change neither vary by heating nor by the first adsorption. Various details are discussed. The properties of the unit area of various quartz samples and also of other silica adsorbents can be identical with respect to the adsorption of water only when the adsorption takes place on an extremely hydratized surface. In the presence of an irreversible adsorption the properties of the unit area can not be compared to one another. Finally the author thanks M. M. Dubinin and A. V. Kiselev for their interest in this paper, and Ye. V. Koromal'di for his joining in the measurements. There are 2 figures, 1 table, and 18 references, 12 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry, AS USSR)

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The Reversible Isothermal Lines of the Adsorption of Water on Quartz SOV/20-120-1-27/63

PRESENTED: December 30,1957, by M. M. Dubinin, Member, Academy of Sciences, USSR

SUBMITTED: December 30, 1957

1. Quartz--Adsorptive properties 2. Water--Adsorption

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5(4)

AUTHOR: Zhdanov, S. P. SOV/62-59-2-28/40

TITLE: On the Separation of Hydrogen in the Process of Quartz Calcination (O vydelenii vodoroda pri prokalivanii kvartsa)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, Nr 2, pp 352-354 (USSR)

ABSTRACT: In the present news in brief the author reports on the investigation of the hydrogen separated on the calcination of quartz. It was found that the hydroxyl groups occurring on the quartz surface are able to dissociate at temperatures above 500°, hydrogen being formed. In contrast with quartz, no separation of hydrogen could be found on the calcination of silica gel KSK-2. Water was also formed if only sporadic hydroxyls far distant from one another were left on the surface. Probably the separation of water under these conditions is possible in consequence of a proton migration. In the case of quartz such a proton migration is apparently complicated owing to the hard structure of the crystal surface. The author expressed his gratitude to E. K. Keler for his interest in this investigation. There are 1 figure and 3 references, 1 of which is Soviet.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

On the Separation of Hydrogen in the Process of Quartz Calcination SOV/62-59-2-28/40

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 4, 1958

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ZHDANOV, S.P.

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. 554 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. Poray-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 N.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 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. Porey-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.N. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dutrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

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5(4)

SOV/62-59-4-9/42

AUTHORS: Zhdanov, S. P., Koromal'di, Ye. V.

TITLE: On Structural Peculiarities of Sodium Boron Silicate Glasses Related to Their Chemical Resistance (O strukturnykh osobennostyakh natriyevoborosilikatnykh stekol v svyazi s ikh khimicheskoy ustoychivost'yu). Communication 1. Investigation of the Chemical Resistance of Some Low-alkali Sodium Boron Silicate Glasses and of the Structure of Their Lixiviation Products (Soobshcheniye 1. Issledovaniye khimicheskoy ustoychivosti nekotorykh maloshchelochnykh natriyevoborosilikatnykh stekol i struktury produktov ikh vyshchelachivaniya)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 626-636 (USSR)

ABSTRACT: In the present work the structure of the porous products obtained by a treatment of low-alkali sodium boron silicate glasses with hydrochloric acid has been investigated. The dissolving rate of the glass components owing to the selective solubility of the glass was determined for similar samples. From the results obtained a relationship between the chemical resistance of these glasses and the structure of their lixiviation products has been

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

On Structural Peculiarities of Sodium Boron Silicate Glasses Related to Their Chemical Resistance. Communication 1. Investigation of the Chemical Resistance of Some Low-alkali Sodium Boron Silicate Glasses and of the Structure of Their Lixiviation Products

SOV/62-59-4-9/42

discovered and the dependence of the chemical resistance on the composition and heat treatment has been clarified. Three batches of glass with equal SiO_2 contents of 60%, 65%, and 70% and varying Na_2O contents from 0-4% were investigated. The addition of smaller amounts of sodium oxide to alkali-free glasses increases initially the chemical resistance, which is strongly reduced, however, by a further increase in Na_2O content. This has been observed with all glasses investigated. Among hardened glasses, those containing 2% Na_2O have the highest resistance (Fig 1). Annealed glasses have the highest chemical resistance at 3% Na_2O. An increase in alkali oxide content (up to 2-3%) does not only retard the lixiviation but in some cases even reduces the limiting amounts of B_2O_3 and Na_2O entering into solution (Tables 1 and 2, Fig 2). During an analysis of the results of the absorption investigation the overall shape of the isotherms

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On Structural Peculiarities of Sodium Boron Silicate Glasses Related to Their Chemical Resistance. Communication 1. Investigation of the Chemical Resistance of Some Low-alkali Sodium Boron Silicate Glasses and of the Structure of Their Lixiviation Products

(Figs 3 and 4) permits already the conclusion that the porous glasses vary widely in structure. Numerical results are given in table 3. Adsorption isotherms having a wide hysteresis loop are characteristic of glasses containing 1% and, particularly, 2% Na_2O. These structures can be considered transitional between homogeneous, fine-porous (alkali-free glasses) and coarse-porous structures (4% Na_2O). Isotherms of glasses containing 3% Na_2O show a further transition from fine-porous to coarse-porous structures. Adsorption isotherms of annealed glasses (Fig 4) have generally the same characteristics. A displacement of the hysteresis loop in the direction of a higher p/p_s is characteristic of the isotherms of annealed glasses. The authors appreciate the interest shown by Professor E. K. Keler. There are 4 figures, 3 tables, and 14 references, 13 of which are Soviet.

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

On Structural Peculiarities of Sodium Boron Silicate Glasses Related to Their Chemical Resistance. Communication 1. Investigation of the Chemical Resistance of Some Low-alkali Sodium Boron Silicate Glasses and of the Structure of Their Lixiviation Products SOV/62-59-4-9/42

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 9, 1957

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5 (2)

AUTHORS: Zhdanov, S. P., Koromal'di. Ye. V. SOV/62-59-5-8/40

TITLE: On the Structural Characteristics of Sodium Boron Silicate ~~Glasses Associated with~~ Their Chemical Stability (O strukturnykh osobennostyakh natriyevoborosilikatnykh stekol v svyazi s ikh khimicheskoy ustoychivost'yu). Communication 2. On the Causes of the Great Changes of Chemical Stability of Sodium Boron Silicate Glasses Depending on the Composition and Their Thermal History (Soobshcheniye 2. O prichinakh rezkikh izmeneniy khimicheskoy ustoychivosti natriyevoborosilikatnykh stekol v zavisimosti ot sostava i ikh termicheskoy istorii)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 811 - 818 (USSR)

ABSTRACT: In the previous communication the authors carried out the investigations mentioned in the title with weakly alkaline sodium boron silicate glasses only, and but a general evaluation of the results obtained without a comparison with other investigations results was given. The comparison is carried out in the present communication; moreover, additional experimental investigations of sodium boron silicate glasses with a high sodium oxide content are carried out. The dependence of the in-

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On the Structural Characteristics of Sodium Boron Silicate Glasses Associated with Their Chemical Stability. Communication 2. On the Causes of the Great Changes of Chemical Stability of Sodium Boron Silicate Glasses Depending on the Composition and Their Thermal History

SOV/62-59-5-8/40

crease of the selective solubility of sodium boron silicate glasses on the porosity of the leached layer was used in the determination of the chemical stability of the glasses, i.e. the increase of a porous film is measured, which is formed by the effect of acids and by the selective solubility of the individual components of the glass in the acids; this is used as measurement of stability. For this reason the quantity of B_2O_3 and Na_2O which is formed at the beginning of the HCl effect depending on the size of the radius of the pores of the leached layer (Table 1) is measured for variously manufactured glass (tempered and annealed), as well as the variation of the radius of the pores depending on the Na_2O content of the initial glass (Table 2); moreover, the increase of thickness of the porous film of opalescent and transparent glasses of the same composition is determined as well as the isothermal line of adsorption of ethanol on porous glass surfaces. All investigations

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On the Structural Characteristics of Sodium Boron Silicate Glasses Associated with Their Chemical Stability. Communication 2. On the Causes of the Great Changes of Chemical Stability of Sodium Boron Silicate Glasses Depending on the Composition and Their Thermal History SOV/62-59-5-8/40

show that the chemical stability of the glasses investigated depends neither on the variously strong or weak solubility of the glass components contained by them nor on the diffusion rate of the reaction products in the leached layer, the latter depending on the dimensions of the pores of this layer. The chemical stability of the glasses investigated, which varies considerably with the change of their composition and thermal treatment, is directly related to the structural change of the porous products which are formed with the acid treatment of the glass. There are 6 figures, 2 tables, and 17 references, 15 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences, USSR)

SUBMITTED: July 9, 1957

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

5(2) SOV/62-59-6-9/36

AUTHOR: Zhdanov, S. P.

TITLE: On Structural Peculiarities of Sodium Borosilicate Glasses Associated With Their Chemical Stability (O strukturnykh osobennostyakh natriyevoborosilikatnykh stekol v svyazi s ikh khimicheskoy ustoychivost'yu). Communication 3. Structural Transformations in Sodium Borosilicate Glasses (Soobshcheniye 3. Strukturnyye prevrashcheniya v natriyevoborosilikatnykh steklakh)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 6, pp 1011 - 1018 (USSR)

ABSTRACT: In a previous paper (Ref 1) it has been shown that the chemical stability of glasses is closely connected with the qualities of the porous surface layer of the glasses, which porosity is caused by leaching out. On the other hand, the qualities of the porous structure of this layer depend on chemical and structural variations that occur in the glass, and may be caused by different thermal treatment. In this connection the variation in the structure of glass as a result of thermal treatment, thus transformation of the crystals into crystallites and disorientation of the crystallites were investigated. Because of the roentgenographically observed small growth of the crystal

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On Structural Peculiarities of Sodium Borosilicate Glasses Associated With Their Chemical Stability. Communication 3. Structural Transformations in Sodium Borosilicate Glasses SOV/62-59-6-9/36

dimensions, the transformation of the glasses when being leached out was not ascribed to this factor. Thus also the transformation of the trivalent into tetravalent boron was taken into account. Here the formation of polar groups $\left[\bar{B}\left(\frac{O}{2}\right)_4 Na^+\right]$ and their association to borate complexes, and furthermore a change in the number of these complexes and in their dimensions as well as in their distribution in the glass and with respect to each other could be observed. Also some properties of the sodium borosilicate glasses are listed, which in a very complicated way influence the dependence of the structural changes on the composition and the treatment of these glasses. The present paper was compiled from publications dealing with the subject concerned (Refs 2-29). Finally, the author thanks E. K. Keler for having read the manuscript and discussed it with him. There are 2 figures and 29 references, 22 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR(Institute of Chemistry of Silicates of the Academy of Sciences, USSR)

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On Structural Peculiarities of Sodium Borosilicate Glasses Associated With Their Chemical Stability. Communication 3. Structural Transformations in Sodium Borosilicate Glasses SOV/62-59-6-9/36

SUBMITTED: July 9, 1957

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S. P. [redacted] Doc Chem Sci -- (diss) " Structure of porous glass and structural conversions in sodium-borosilicate glass." Len, 1959. 39 pp with ~~diagrams~~ drawings (Acad Sci USSR. Inst of Chemistry of Silicates), 175 copies

List of author's works, pp 38-39 (24 titles) (KL, 47-59, 113)

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S/081/61/000/019/045/085
B110/B101

15.2510

AUTHOR: Zhdanov, S. P.

TITLE: Changes in the structure of glasses containing B_2O_3

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1961, 308, abstract 19K249 (Sb. "Stekloobrazn. sostoyaniye". M. - L. , AN SSSR, 1960, 502 - 507. Diskus. , 522 - 524)

TEXT: The peculiar change in the chemical stableness of low-alkali sodium boro-silicate glasses is explained by particularities of their submicroinhomogeneous structure and by formation of isolated borate ranges completely surrounded by SiO_2. When explaining the causes of the irregularities one has to consider not only the change in the coordination state of the boron but also the inconstancy of the properties of the boron oxide tetrahedrons in the glasses and the changes in the submicroinhomogeneous structure of these glasses. [Abstracter's note: Complete translation.]

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

Zhdanov, S.P.

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 SSSR), 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. . . . . 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 Aluminoboron 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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the 6th meeting dealt with the electric properties of glasses. L. M. Belyavskaya reported on the structure determination of glass with the aid of an inhomogeneous electric field; N. M. Vereshchik and V. I. Odelevskiy, "Structure and Properties of Some Oxide Glasses in the Light of the Polymer-theory of the Vitreous State"; R. L. Myuller reported on the agility and the degree of dissociation as functions of the ionic and atomar composition of the glass; V. I. Odelevskiy reported on the nature of dielectric losses in glasslike and crystalline aluminosilicates; V. P. Petrosyan, "Investigation of the Dielectric Polarization and the Losses in Phosphate Glasses"; V. A. Presnov, V. I. Gaman and L. M. Krasil'nikov reported on investigations of the conductivity of glasses in electric high-tension fields; K. K. Yevstrop'yev on the diffusion of Na^{22} and K^{42} in some silicate glasses; V. A. Ioffe, I. S. Yevchevskaya and G. I. Khvostenko on electric properties of crystalline and glasslike aluminosilicates. O. V. Mazurin spoke on his studies which were carried out under the supervision of Professor K. S. Yevstrop'yev at the Kafedra stekla LTI imeni Lensoveta (Chair for Glass of the Leningrad Technological Institute imeni Lensovet) in the report: "The Dependence of the Electroconductivity of Glasses on the Chemical Composition". V. A. Khar'yuzov, O. V. Mazurin and N. M. Subkova gave investigation results on the specific electroconductivity of glasses of the system $SiO_2 - B_2O_3 - BaO$ in the temperature range of from 400-1300° and on the influence of additions of aluminum- and zinc oxide on the electric conductivity of these glasses. At the 7th meeting, 6 reports dealt with glasses as semiconductors, 9 with the coloring of glasses and the influence of radiation and 4 reports with technical properties of glasses. V. A. Ioffe and G. I. Khvostenko, "Electric Properties of Some Semiconductor Glasses". B. T. Kolomiyets, N. A. Goryunova and V. P. Shilo reported on methods for the production of chalcogenide glasses, on some of their general properties and on the limits of the vitreous state in the system $Tl_2Se - As_2Se_3$, $Tl_2Se - Sb_2Se_3$, $Sb_2Se_3 - As_2Se_3$, Tl - As - Se. B. T. Kolomiyets and B. V. Pavlov reported on the optical absorption in a number of binary chalcogenide systems. B. T. Kolomiyets, T. N. Kamontova and G. P. Kazarova reported on the electron conductivity of chalcogenide glasses. A. A. Vaypolin, Ye. A. Poray-Koshits, "Radiographic Investigation of the Structure of Vitreous Arsenic Chalcogenides". V. V. Tarasov and V. A. Romanovskiy reported on the chain structure of the vitreous arsenious sulphide determined by them with calorimetric measurements. K. P. Azarov reported on structure and properties of ferrous boron glasses and

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S/020/61/138/001/017/023
B103/B208

AUTHORS: Zhdanov, S. P. and Buntar', N. N.

TITLE: Investigation of the formation conditions of sodium zeolites in low-temperature hydrothermal synthesis

PERIODICAL: Doklady Akademii nauk SSSR, v. 138, no. 1, 1961, 119-122

TEXT: The authors studied the formation conditions of crystalline alumino-silicates from strongly alkaline alumino-silica gels with an N_2O/Al_2O_3 ratio of between 4 and 6. The SiO_2 content in the gels fluctuated from n = 1 to n = 10. Until quite recently, the production conditions of synthetic zeolites known as Linde's molecular sieves A and X have been unknown, until R. M. Barrer et al. (Ref. 5) published data on this subject. The subject of this paper is regarded as important, since 1) the results of Barrer are thus completed, 2) the increased alkalinity in an optimum one for the crystallization of artificial zeolite (Linde-sieve 13 X), but its formation conditions are not yet clarified in publications. The gels were prepared by intense mixing of alkaline solutions of sodium aluminate

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and sodium silicate which were obtained from NaOH, amorphous SiO_2, $NaAlO_2$ and $Al(OH)_3$ of different degrees of purity. The solution was completely homogenized until the gel was formed (generally 30-40 sec after mixing). Synthesis was performed at 70-200°C. At temperatures up to 100°C glass flasks were used, at higher temperatures stainless steel autoclaves. The approximately 170 products which resulted differed with respect to gel composition, temperature and duration of crystallization. Debye powder patterns were used for phase analysis, recorded on an X-ray ionization apparatus. Chemical analysis was carried out in the laboratory of Professor Yu. V. Morachevskiy. Further, the adsorptive power of typical zeolite samples was studied. The diagram constructed on the basis of the results (Fig. 1) shows the formation ranges of the resultant zeolites. The ratio $\frac{n}{m-1} = k$ was plotted on the x-axis, i.e., the ratio of the number of SiO_2 moles in the gel to the number of excess Na_2O moles, per mole of Al_2O_3. In the range 70 - 200°C, at least five alumino-silicates were obtained from highly alkaline gels ($4 < m < 6$): A (A), Б (B), В (V), Г (G),

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and A (D); the three latter belong to the sodium zeolites. It is concluded from the conformity of the interplanar spacings (Fig. 2) and from the adsorptive power, that G and D are identical with the Linde zeolites (molecular screens) 13 X and 4 A. It may be seen from Fig. 1 that at high excessive alkalinity type A is only formed at low values of k (0.20 - 0.70) (70 - 90°C). With the low alkalinity used in this case, the low SiO_2 concentrations in the gel (n = 1 and 2) are most favorable for its formation. Zeolite X was repeatedly obtained by the authors at 70°C and at k between 0.75 and 1.33. At higher temperatures (90°C), X does not crystallize, but is formed together with the product V. The latter shows a Debye powder pattern deviating from that of A and X, has a considerable adsorptive power with respect to water and can release it on heating without destruction of its crystal lattice. V is certainly also a zeolite and may be identical with zeolite P described by Barrer (Ref. 4). Its composition corresponds to the formula $0.94\ Na_2O \cdot Al_2O_3 \cdot 3.52\ SiO_2 \cdot 4.55\ H_2O$. Its optimum formation conditions lie at 90-120°C and at $1.33 \leq k \leq 4$. Fig. 3 shows the adsorption isothermal lines on the prepared zeolites which had previously been heated in vacuo up to 200°C. The authors found that V is able to adsorb the water vapor in a high and selective degree. The

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calcium form of V, obtained by ion exchange (73 % Na^+ replaced by Ca^{2+}) hardly differs from the sodium form with respect to adsorptive power which will still have to be explained. Between 150 and 200°C basic nosean and analcime (products A and B, Fig. 1) are formed almost exclusively. Nosean is crystallized mainly from gels with higher alkalinity (with low k-values). A and B are frequently formed together. Under the given conditions, A, X, and V may be recrystallized during the synthesis forming another crystalline phase, to give gels whose composition lies in the range of the formation of the individual zeolites. On prolonged standing, transitions: A⟶X, X⟶V, V⟶analcime, are possible. The authors think it necessary to study the subject further. V. A. Kostrova took part in this work. There are 3 figures and 8 references: 2 Soviet-bloc and 6 non-Soviet-bloc. The three most recent references to English-language publications read as follows: R. A. Labine, (Ref. 3: Chem. Eng. 66, no. 16, 1959), R. M. Barrer, J. W. Baynham et al. (Ref. 5: J. Chem. Soc., 1959, 195), L. Broussard, D. P. Shoemaker (Ref. 6: J. Am. Chem. Soc., 82, 1041, 1960).

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences USSR)

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B103/B203

5.1105 also 3009

AUTHORS: Zhdanov, S. P. and Koromal'di, Ye. V.

TITLE: Selective sorption on porous glasses

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 4, 1961, 870-873

TEXT: The authors had shown earlier (Ref. 1:Izv.AN SSSR,OKhN,1959,No.4, 626, No.5,811,1959; Ref. 2: S. P. Zhdanov, Dissertation,Inst.khim. silikatov (Institute of Silicate Chemistry) L.,1959) and in the present paper that selective sorption is not only a specific feature of porous crystals (zeolites) but is also characteristic of some porous glasses. These glasses may act as typical molecular screens. They are produced by lixiviation of two-component alkali silicate- or alkali borosilicate glasses by acid solutions. The authors thank Yu. A. Shmidt for supplying most of the glass specimens. Before sorption, they were heated in vacuo to 100 or 200°C. The authors studied the sorption of CH_3OH and C_4H_9OH, and that of C_2H_5OH. They conclude from the absorbed quantities of water and CH_3OH having small molecules that they are absorbed much more strongly

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Selective sorption on porous glasses

than the large molecules of C_2H_5OH, of the hydrocarbons, and particularly of C_4H_9OH. Therefore, selective sorption by porous glass is due to very fine pores in the glass whose diameter is comparable to the size of simple molecules. Since glasses no. 1 and 3 readily absorb water (molecular diameter d = 2.8 Å) but no nitrogen (d = about 4 Å), the authors suppose a diameter of pores in the glass between 2.8 and 4 Å. Glass no. 2 has larger pores but they are also so fine that most of them remain inaccessible to comparatively small (d = 5.8 Å) molecules of C_4H_9OH and of C_5 alkanes. The authors compare the formation of uniform and fine pores in glass with the "cages" and canals in zeolite crystals where they are formed by dehydration under heating. In the glasses, however, the oxygen packing is so dense that not only the "cages" occupied by alkaline cations but also the free "cages" of the silicon oxygen lattice in the glass remain inaccessible even to so small molecules as those of water. The lixiviation process starts with the exchange of alkali cations by acid protons:

$$\underset{\text{glass}}{-\overset{|}{\underset{|}{Si}}-O^-Na^+} + \underset{\text{solution}}{H^+} \longrightarrow \underset{\text{glass}}{-Si-OH} + \underset{\text{solution}}{Na^+}$$

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Selective sorption on porous glasses

With a sufficiently high content of SiO_2 in the glass, the lixiviation with acids will neither destroy nor transform the Si—O—Si bonds in the Si—O lattice. The formation of fine canals in the glass cannot be explained in this way either. They are formed by lixiviation of large alkali ions and replacement by the much smaller protons. The pore volume increases with the ion radius of the alkali cation and with the content of alkali oxide in the glass which the authors take as a proof of the above thesis. On the other hand, the pore volumes determined from the sorption isotherms of water prove to be twice to three times larger than the total volume of the cations lixiviated from the glass. The authors explain this not only by the fact that the cavity left by the lixiviated cation in the glass must always be larger than the cation itself. The secondary water synthesis from adjacent hydroxyls formed after the replacement of irregularly scattered alkali cations by protons plays a more important part. The water thus formed in the glass at low temperatures remains in the glass, is, however, separated out on evacuation of the porous glass already at room temperature. A certain additional volume of the pores becomes free by carrying along part of the oxygen in the glass. Porous glasses capable of selective sorption are inferior to porous crystals (zeolites) with

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Selective sorption on porous glasses

respect to their sorption volume. These glasses may, however, extend and complete the existing set of molecular screens thanks to their specific properties and the possibility of regulating their structure. They may prove to be efficient for the separation of mixtures where porous crystals are not used. There are 3 figures and 5 Soviet-bloc references.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences USSR)

PRESENTED: January 20, 1961, by M. M. Dubinin, Academician

SUBMITTED: January 20, 1961

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

S/080/62/035/007/012/013
D202/D307

AUTHOR: Zhdanov, S.P.

TITLE: The low temperature dehydration of silica hydrates

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 7, 1962, 1620-1621

TEXT: The author discusses the possibility of dehydrating crystalline and glass-forming alkaline silicates by leaching in acid solutions at low temperatures. While crystalline $H_2Si_2O_5$ is formed from crystalline sodium disilicate, the same process leads to the formation of amorphous products from sodium glasses: $Na_2O.2SiO_2$, $Na_2O.3SiO_2$ and $Na_2O.4SiO_2$. The amount of water in $H_2Si_2O_5$ determined by heating in the range 100-900°C corresponds to the theoretical, but those in the above leached glasses were markedly lower than the calculated values. This is ascribed to a previous partial dehydration at low temperature. During this kind of process water could be synthesized from oxygen of the glass silica lattice, which

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The low temperature dehydration ... S/080/62/035/007/012/013
D202/D307

would lead to the formation of pores and hollows allowing the selective adsorption of small ions. There is 1 figure.

ASSOCIATION: Institut khimii silika tov AN SSSR (Institute of Silicate Chemistry, AS USSR)

SUBMITTED: January 25, 1961

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PHASE I BOOK EXPLOITATION SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye (Synthetic Zeolites: Production, Investigation, and Use). Moscow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady) Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor of Chemical-Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P. Golub'.

PURPOSE: This book is intended for scientists and engineers engaged in the production of synthetic zeolites (molecular sieves), and for chemists in general.

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Synthetic Zeolites: (Cont.) SOV/6246

COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

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Synthetic Zeolites: (Cont.) SOV/6246

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Synthetic Zeolites: (Cont.) SOV/6246

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PRODUCTION OF ZEOLITES

Zhdanov, S. P., and N. N. Buntar'. Investigation of the Hydrothermal Synthesis Conditions and Properties of Sodium Zeolites 105

Tsitsishvili, G. V., and T. G. Andronikashvili. Synthesis and Some Adsorption Properties of Synthetic Zeolites 117

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APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P., doktor khim.nauk

Natural and synthetic silicate adsorbents. Vest. AN SSSR 32 no.10:60-64 O '62. (MIRA 15:10)
(Silicates) (Adsorbents)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

DZHIGIT, O.M.; ZHDANOV, S.P.; KISELEV, A.V.; MUTTIK, G.G.

Differential heats of adsorption of n-pentane and diethyl ether by porous crystals of zeolite of type 5A. Zhur. fiz. khim. 36 no.4:919-920 Ap '62. (MIRA 15:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet i Institut khimii silikatov AN SSSR.
(Heat of adsorption) (Pentane) (Ethyl ether)
(Zeolite crystals)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; KALMANOVSKIY, V.I.; KISELEV, A.V.; FIKS, M.M.; YASHIN, Ya.I.

Use of porous glasses as adsorbents in gas chromatography.
Zhur.fiz.khim. 36 no.5:1118-1120 My '62. (MIRA 15:8)

1. Institut khimii silikatov AN SSSR; Opytno-konstruktorskoye byuro avtomatiki Gosudarstvennogo komiteta khimicheskoy promyshlennosti pri Sovete Ministrov SSSR, Dzerzhinskiy filial i Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet.
(Glass) (Adsorbents) (Gas chromatography)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

S/076/62/036/009/011/011
B101/B102

AUTHOR: Zhdanov, S. P.

TITLE: The problem of adsorptive properties and hydration of the quartz surface

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 9, 1962, 2098 - 2102

TEXT: Two papers by M. M. Yegorov, V. F. Kiselev, and K. G. Krasil'nikov (Zh. fiz. khimii, 35, 2031, 2234, 1961) on differences in the adsorptive properties of quartz and in the degree of hydration of various quartz samples are discussed. Their conclusions are considered to be incorrect. The experimental data, however, can be explained by using the present author's assumption of an irregular ultraporosity of the quartz samples (Dokl. AN SSSR, 120, 103, 1958; Sb. "Polucheniye, struktura i svoystva sorbentov"(in the "Production, Structure, and Properties of Sorbents" Collection) Goskhimizdat 1959). The reversible isotherms for water adsorption can be converted to a single isothermal line by multiplication with a coefficient; this isothermal line is well described by a BET equation in the range of a relative pressure variation p/p_s between 0.025 and

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S/076/62/036/009/011/011
B101/B102

The problem of adsorptive ...

0.3. There are 2 figures and 1 table.

ASSOCIATION: Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry AS USSR)

SUBMITTED: March 2, 1962

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APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; BUNTAR', N.N.

New synthetic sodium zeolites and their adsorption properties. (MIRA 16:2)
Dokl. AN SSSR 147 no.5:1118-1121 D '62.

1. Institut khimii silikatov im. I.V. Grebenshchikova AN SSSR.
Predstavleno akademikom M.M. Dubininym.
(Zeolites) (Adsorption)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; BUNTAR', N.N.; YEGOROVA, Ye.N.

Dependence of the composition of synthetic zeolites of the faujasite type on the crystallization conditions. Izv. AN SSSR. Ser. khim. no.11:2061-2063 N '63. (MIRA 17:1)

1. Institit khimii silikatov AN SSSR.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

[illegible]

[illegible] hydrocarbons

SOURCE: Neftekhimiya, v. 5, no. 3, 1965, [illegible]

TOPIC TAGS: adsorption chromatography, alkane, aromatic hydrocarbon, alkylbenzene, [illegible], ethane, benzene, hydrocarbon [illegible]

[illegible] adsorption chromatogr[illegible]

[illegible]

and alkylbenzene is greater than the [illegible]

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

SUBMITTED: 11Dec62 DATE ACQ: [illegible] ENCL: [illegible]

SUB CODE: CH, FL NO REF SOV: [illegible] OTHER: [illegible]

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APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

SAMSONOVA, I.N.; ZHDANOV, S.P.; BUNTAR', N.N.; KOROMAL'DI, Ye.V.; GOLUBEVA, V.A.

Determination of the content of n-paraffins in the gasoline distillates of crude oil by the method of molecular sieves. Zhur. prikl. khim. 36 no.11:2502-2506 N '63. (MIRA 17:1)

1. Leningradskiy gosudarstvennyy universitet imeni A.A. Zhdanova i Institut khimii silikatov AN SSSR.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; KISELEV, A.V.; YASHIN, Ya.I.

Use of porous film-coated granulated glasses in gas chromatography. Zhur. fiz. khim. 37 no.6:1432-1434 Je '63. (MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, Dzerzhinskiy filial Opytno-konstruktorskogo byuro avtomatiki Gosudarstvennogo komiteta khimicheskoy promyshlennosti pri Sovete Ministrov i Institut khimii silikatov AN SSSR.
(Gas chromatography)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; KISELEV, A.V.; LYGIN, V.I.; TITOVA, T.I.

Change of the infrared spectrum of zeolites X during their thermal treatment in vacuo. Dokl. AN SSSR 150 no.3:584-587 My '63. (MIRA 16:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova i Institut khimii silikatov AN SSSR. Predstavleno akademikom A.N. Frumkinym.

(Zeolites—Absorption spectra)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ACCESSION NR: AP3003226

sodium-borosilicate, low-alkaline [illegible]
borosilicate, and [illegible]

Card [illegible]

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

L 12835-65

ACCESSION NR: AP3003226

dehydrating low-molecular fatty acids which cannot be [illegible]

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S. P.; YASTREBOVA, L. S.

"On the structure of silicon-oxygen sceleton of alkaline-silicate glasses."

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

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ACCESSION NR: AP4041791 S/0080/64/037/007/1442/1446

AUTHORS: Yastrebova, L. S.; Zhdanov, S. P.

TITLE: Investigation of the lixiviation products of highly siliceous alkali silicate glasses

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 7, 1964, 1442-1446

TOPIC TAGS: alkali silicate glass, structure, lixiviated alkali silicate glass, pore size, pore volume, sodium silicate glass, potassium silicate glass, dehydration, chemical stability, absorptive property, water adsorption, methanol adsorption

ABSTRACT: The structure of the lixiviation products of two and three component alkali silicate glasses of the composition SiO_2 87, R_2O 13 mol% (R = K or Na) was examined. Na/13, Na/11 + K/2, Na/3 + K/10 and K/13 glasses were leached with 1N HCl at 50C to form porous products comprised entirely of very fine pores which will adsorb water molecules but are too small for methanol molecules to penetrate. Curves for the dehydration of these glasses in air were drawn for temperatures from 20-800C. The lixiviation products of the potassium silicate glasses are much more porous

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ACCESSION NR: AP4041791

than those of the sodium silicate glasses; their pore volume and pore dimensions are greater. The potassium silicate glasses are less stable chemically; this property depends primarily on the structure of the porous layer formed by lixiviation, which in turn depends on the composition and structure of the initial glass. The obtained results are explained by the substitution of the alkali glass cations by the acid protons during lixiviation. Orig. art. has: 3 figures and 1 table

ASSOCIATION: None

SUBMITTED: 30Aug62 ENCL: 00

SUB CODE: MT NR REF SOV: 005 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; BUNTAR', N.N.; YEGOROVA, Ye.N.

Structure and absorption properties of zeolite Zh.
Dokl. AN SSSR 154 no.2:419-422 Ja'64. (MIRA 17:2)

1. Institut khimii silikatov im. V.I. Grebenshchikova AN SSSR. Predstavleno akademikom M.M. Dubininym.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

L 36994-66 EWT(m)

ACC NR: AP6027041 SOURCE CODE: UR/0020/66/166/005/1107/1110

AUTHOR: Zhdanov, S. P.; Novikov, B. G.;

ORG: Institute of Chemistry of Silicates im. I. V. Grebenshchikov, AN SSSR (Institut khimii silikatov AN SSSR)

TITLE: Synthetic erionites and their adsorption properties with respect to water vapors 40 B

SOURCE: AN SSSR. Doklady, v. 166, no. 5, 1966, 1107-1110

TOPIC TAGS: adsorption, water vapor, zeolite, chemical synthesis, chemical composition, chemical reaction, cation, reaction rate, reaction temperature

ABSTRACT: Erionite, a rare natural zeolite, was previously successfully synthesized by one of the authors (S. P. ZHDANOV, Izv. AN SSSR, Ser. Khim., No 6, 1965) from alkaline Na-P silica-alumina gels at 100°C. Compared with a $SiO_2:Al_2O_3$ ratio of 6 for natural erionites, this ratio for synthetic erionites varies from 7 to 7.4. Isotherms of water adsorption are presented as a function of changes in the chemical composition of erionite (removal of cations, formation of hydroxyls, decomposition of NH_4^+ and dehydroxylization) owing to decationization, dealuminization and heat treatment. Adsorption of water on the original cation form of erionite is independent of heating temperature within the investigated limits (up to 800°C), whereas adsorption on dealuminized specimens decreases with increasing temperature. Conversely, adsorption of the NH_4-form considerably increases with increasing temperature. These differences may be associated with the differences in the packing density of the molecules of the adsorbed water in the cavities in such cases.

This paper was presented by Academician M. M. Dubinin on 17 June 1965. The authors thank Ye. N. Yegorova for carrying out the analysis. /JPRS: 36,455/

SUB CODE: 07 / SUBM DATE: 18Jun65 / ORIG REF: 005 / OTH REF: 008

UDC: 549.67

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APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; KISELEV, A.V.; LYGIN, V.I.; OVSEPYAN, M.Ye.; TITOVA, T.I.

Infrared spectra of synthetic zeolites type NaA, NaX, NH_4X and their decationized forms. Zhur.fiz.khim. 39 no.10:2453-2458 O '65. (MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet i Institut khimii silikatov AN SSSR. Submitted July 6, 1964.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; BUNTAR'-SAMULEVICH, N.N.; OVSEPYAN, M.Ye.

Synthetic chabazites and their adsorptive properties. Dokl. AN SSSR 161 no.2:384-387 Mr '65. (MIRA 18:4)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR. Submitted August 27, 1964.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

YASTREBOVA, L.S.; ZHDANOV, S.P.

Products of leaching of high-silica alkali silicate glasses.
Zhur.prikl.khim. 37 no.7:1442-1446 Jl '64. (MIRA 18:4)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

DUBININ, M.M.; ZHDANOV, S.P.; ZHUKOVSKAYA, Ye.G.; MURDMAA, K.O.; POLSTYANOV, Ye.F.; SAKAVOV, I.Ye.; SHISHAKOV, N.A.;

Adsorption properties and the secondary porous structure of adsorbents having molecular sieve action. Report No.9: Parameters of elementary crystalline cells and the limiting adsorptive volumes of A-type synthetic zeolites. Izv.AN SSSR.Ser.khim. no.9:1565-1573 S '64. (MIRA 17:10)

Adsorption properties and the secondary porous structure of adsorbents having molecular sieve action. Report No.10: Composition, adsorptive properties, and the limiting adsorptive volumes of X-type synthetic zeolites. Ibid.:1573-1580

1. Institut fizicheskoy khimii AN SSSR i Institut khimii silikatov AN SSSR.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; PAL'CHIK, R.I.

Adsorption dehydration of alcohols by means of synthetic zeolites of the NaX type. Zhur. fiz. khim. 39 no.2:466-467 F '65. (MIRA 18:4)

1. Institut khimii silikatov imeni Grebenshchikova AN SSSR.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P., dokto. khim.nauk; BELOTSERKOVSKIY, G.M., kand.khim.nauk

Research on zeolites; second all-Union conference in Leningrad.
Vest. AN SSSR 34 no.9:135-137 S '64. (MIRA 17:10)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; KISELEV, A.V.; LYGIN, V.I.; TITOVA, T.I. (Moskva)

Infrared spectra of synthetic faujasites of varying composition and of water adsorbed by them. Zhur. fiz. khim. 38 no.10:2408-2414 O '64. (MIRA 18:2)

1. Institut khimii silikatov AN SSSR i Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

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ZHDANOV, S.P.

Adsorption properties and hydration of a quartz surface (remarks on the articles by M.M. Egorov, V.F. Kiselev, E.G. Krasil'nikov). Zhur. fiz. khim. 36 no.9:2098-2102 S '62. (MIRA 17:6)

1. Institut khimii silikatov AN SSSR.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.; OVSEPYAN, M.Ye.

Some synthetic potassium zeolites and their properties. Dokl. AN SSSR 157 no.4:913-916 Ag '64 (MIRA 17:8)

1. Institut khimii silikatov im. I.V. Grebenshchikova AN SSSR. Predstavleno akademikom M.M. Dubininym.

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

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account the parameters of the elementary crystal cells [illegible] The following

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"APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8

ZHDANOV, S.P.

Using the UDSSh-4M modernized welding gun for welding on pins in an atmosphere of carbon oxide. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 17 no.2:30 '64. (MIRA 17:6)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064620012-8"

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L 11867-66 EWT(m)/EWP(e)/EWP(b) GS/WH

ACC NR: AT6000478 SOURCE CODE: UR/0000/65/000/000/0122/0126

AUTHOR: Zhdanov, S. P.; Yastrebova, L. S.; Koromal'di, Ye. V.; Khvoshchev, S. S.

ORG: None

TITLE: Structure of the silicon-oxygen framework of alkali metal silicate glasses as determined by studies of products of their leaching

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya, Leningrad, Izd-vo-Nauka, 1965, 122-126

TOPIC TAGS: silicate glass, glass property

ABSTRACT: Acid leaching of alkali metal silicate glasses has shown that porous glasses the pores of which are due to the removal of alkali metal cations are always formed. The existence of a definite relationship between the alkali metal oxide content in the initial glass and the volume and size of the pores indicates that Si-O-Si bonds are not broken or rearranged during the leaching. Disilicic acid is formed by a simple substitution of H^+ ions for Na^+ ions:

$$\underset{\text{crystal}}{-\overset{|}{\underset{|}{Si}} - \bar{O}Na^+} + \underset{\text{solution}}{H^+} \rightarrow \underset{\text{crystal}}{-\overset{|}{\underset{|}{Si}} - OH} + \underset{\text{solution}}{Na^+}$$

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ACC NR: AT6000478

the silicon-oxygen network remaining unaltered (as shown by x-ray diffraction spectra). The proposed scheme of the leaching process is consistent with the concept of their homogeneous structure. It is postulated that in inhomogeneous sodium silicate glasses with a low Na_2O content the regions of preferential localization of $-\overset{|}{Si}-O^-R^+$ bonds are not separated by silica interlayers but linked to one another, since such interlayers would block the leaching of such inhomogeneous glasses. Orig. art. has: 5 figures and 2 tables.

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USSR/Farm Animals. Honey Bee.

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Abs Jour: Ref Zhur-Biol., No 4, 1958, 16875.

Author : Zhdanov S. V., Dolotovskaya U. A., Kozyrev Ye. M.
Inst :
Title : Study by Means of Radioactive Phosphorus of the Rapidity of Passage of Liquid Food Through the Sections of the Intestines of Bees.
(Issledovaniye s pomoshchiyu radioaktivnogo fosfora skorosti prokhozhdeniya zhidkoy pishchi po otdelam kishechnika pchely)

Orig Pub: Uch. zap. Kazansk. un-ta, 1956, 116, No 14, 57-64.

Abstract: The work has a methodical character. It was found that P^{32} in a dose of $\sim$ 0.1 μ Cu (up to 12,000 impulses per minute) does not produce noticeable changes in the condition and behavior of bees. The

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ZHDANOV, S.V.

Nosema and the morphological changes in bees. Uch.zap.Kaz.un. 120 no.6:209-270 '60. (MIRA 16:2)
(Bees—Diseases and pests) (Nosema)

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SAVENKO, Yu., gornyy inzh.; ZHDANOV, V., gornyy inzh.

Reliability is the most important technical characteristic.
NTO 3 no.9:35-36 S '61. (MIRA 14:8)
(Machinery--Design and construction)

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