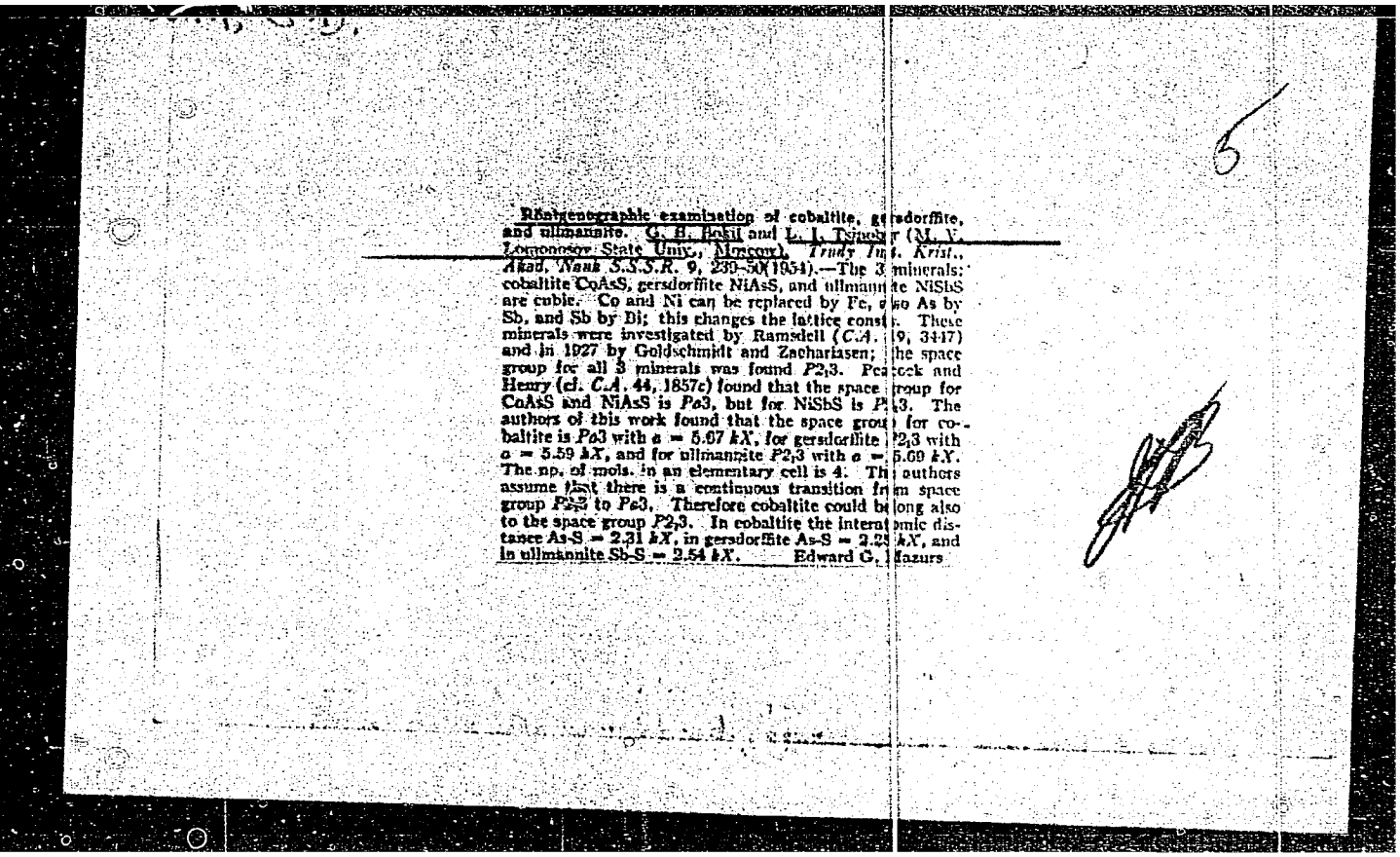

5

X-ray crystallographic examination of cobaltite, gersdorffite, and ullmannite. G. B. Bokii and L. L. Tsinober (M. V. Lomonosov State Univ., Moscow). *Trudy Inst. Kristl., Akad. Nauk S.S.S.R.* 9, 230–50 (1954).—The 3 minerals: cobaltite CoAsS, gersdorffite NiAsS, and ullmannite NiSbS are cubic. Co and Ni can be replaced by Fe, also As by Sb, and Sb by Bi; this changes the lattice const. These minerals were investigated by Ramsdell (*C.A.* 19, 3417) and in 1927 by Goldschmidt and Zachariasen; the space group for all 3 minerals was found $P2_13$. Peacock and Henry (*cf. C.A.* 44, 1857c) found that the space group for CoAsS and NiAsS is $Pa3$, but for NiSbS is $P2_13$. The authors of this work found that the space group for cobaltite is $Pa3$ with $a = 5.67$ *kX*, for gersdorffite $P2_13$ with $a = 5.59$ *kX*, and for ullmannite $P2_13$ with $a = 5.69$ *kX*. The no. of mols. in an elementary cell is 4. The authors assume that there is a continuous transition from space group $P2_13$ to $Pa3$. Therefore cobaltite could belong also to the space group $P2_13$. In cobaltite the interatomic distance As-S = 2.31 *kX*, in gersdorffite As-S = 2.2[illegible] *kX*, and in ullmannite Sb-S = 2.54 *kX*. Edward G. Mazurs

Bokiy, G.B.

V. X-ray structural and crystallooptical investigations of complex compounds of platinum and cobalt. G. B. Bokii. *Trudy Inst. Krist., Akad. Nauk S.S.S.R.* 10, 84–98(1954); cf. *C.A.* 48, 3180*i*; 49, 6018*h*.—Chiefly the Werner and Miolatti complex salts with Pt^{++}, Pt^{4+}, and Co^{3+} as central cations are discussed; the structures of $[Pt(NH_3)_4Cl]Cl_2 \cdot H_2O$, *trans*-$[Pt(NH_3)_4Cl_2]Cl_2$, *trans*-$[Pt(NH_3)_2Cl_4]$, $K_2[PtCl_4]$, *trans*-$K_2[PtCl_2(NO_2)_4]$, *trans*-$[Pt(NH_3)_2Cl_2]Cl.H_2O$, and *cis*-$[Pt(NH_3)_2Cl_4]$ are illustrated, all of which are in complete agreement with the stereochem. theory. The covalent distance Pt-Cl varies between 2.30 to 2.35 A., that of covalent Pt-N between 1.98 and 2.03 A. and the Cl-Cl distance varies from 3.58 to 3.79 A. In *trans*-$[Pt(NH_3)_4Cl_2]$.$K[Pt-NH_3Cl_3]$, $K_2[PtCl_4]$, and $K_2[Pt(NO_2)_4]$ the ionic distances are: K^+-Cl^- = 3.14, K^+-O^{--} = 2.69 A. The relations of the structural properties to those of the optical refraction, especially with the mol., coördination, and ionic refractions, are made evident by the tabulated results from previous publications of B. The detn. of cis and trans isomers in inorg. complex salts is based on the distinctive refraction properties and the coördination refractions. W. Eitel

BOKIY, G.B.

USSR

√Quantitative characteristic of trans-influence (in complexes). G. B. Bokii and S. S. Batsanov. *Doklady Akad. Nauk S.S.S.R.* 98, 1295-8(1954).—Refractometric measurements were used to obtain a quant. measure of the mutual effect exerted by groups in the inner sphere of complex compds. of Pt(II) and Pt(IV). Following coördinate refractions (I) for $\lambda = \infty$ were found for Pt(II): Cl-Pt-Cl 17.55, NH_3-Pt-NH_3 11.48, NO_2-Pt-NO_2 10.76, Cl-Pt-NH_3 14.90, NH_3-Pt-NO_2 18.19; for Pt(IV): Cl-Pt-Cl 16.90, NH_3-Pt-NH_3 9.83, NO_2-Pt-NO_2 10.15, Cl-Pt-NH_3 13.62, NH_3-Pt-NO_2 14.20. Thus, I for compds. with different addends, e.g. Cl-Pt-NH_3, was larger than one half of the sum of the I of two corresponding compds. with equal addends (Cl-Pt-Cl and NH_3-Pt-NH_3). This is taken as a proof of higher lability of electrons in case of different addends. The incremental increase for NO_2-Pt-NH_3(II) was higher than for Cl-Pt-NH_3(II), in agreement with stronger trans-influence of $-NO_2$. In Pt(IV) compds., the reverse is true. Similar relations held in Co(III) compds.; I was: NH_3-Co-NH_3 9.42, NO_2-Co-NO_2 19.24, NH_3-Co-NO_2 18.91. It is proposed to use I to calc. quantitatively the degree of trans-influence.

Andrew Dravnieks

USSR/Chemical Technology. Chemical Products and Their Application. J-12
Glass. Ceramics. Building Materials.

Abs Jour: Referat Zh.-Kh., No 8, 1957, 27611

Author : G.B. Bokiy.
Inst :
Title : Some Questions Concerning Structure of Glass in Light of Crystallo-chemistry.

Orig Pub: vSb Stroyeniye stekla. M.-L.,AN SSSR, 1955, 350-352.

Abstract: The x-ray analysis has proved long ago that there are no molecules in silicates, but even now there are supporters of the molecular structure of silicates and O.K. Botvinkin and K.S. Yevstrop-yev belong to them in particular. The absence of molecules in silicates, as well as the presence of orderly sections (crystallites) in glass are considered in crystallo-chemistry as solidly proved. There are no incompatible boundaries between the theory of crystallites and the theory of Zahariasen, they are two aspects of

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Abs Jour: Referat Zh.-Kh., No 8, 1957, 27611

one and the same question. There are in glass more orderly sections (crystallites) and there are also less orderly sections. But even in the orderly sections the orderliness should be less than in silicate crystals, and the atoms making the oxygen bridges connecting these two regions - the orderly and the disorderly ones cannot be referred either to one or to the other region, i.e. there is a continuous transition here and there are no phase boundaries among the crystallites. Further, the author objects to making no difference between organic and inorganic glasses, as well as to schematic pictures of silicium-oxygen tetrahedrons developed by G.A. Stepanov. See also RZhKhim, 1957, 1564, 5159.

Bokiy, G.B.

USSR/ Chemistry - Inorganic chemistry

Card 1/1 Pub. 40 - 1/26

Authors : Bokiy, G. B., and Batsanov, S. S.

Title : Crystallo—optical method of determining the structure of complex compounds

Periodical : Izv. AN SSSR Otd. khim. nauk 2, 193 - 196, Mar-Apr 1955

Abstract : Experimental data are presented regarding the coordinate refractions of tetravalent Pt. The geometrical configuration was determined by comparing the experimentally measured refraction indexes with theoretically calculated indices for various isomeric forms. The calculation of the refraction indices was accomplished by the Lorentz method. The advantages of the crystallo-optical method are listed. The structure of a newly synthesized cis-isomer $K_2Pt(NO_2)_4Cl_2$ was determined by this new method. Eight references: 6 USSR and 2 German (1933-1954). Tables.

Institution : Acad. of Sc., USSR, The N. S. Kurnakov Inst. of Gen. and Inorg. Chem.

Submitted : April 27, 1954

USSR/Geology - Sulfide crystals FD-2175

Card 1/1 Pub. 129-15/20

Author : Bokiy, G. B., and Pobedimskaya, Ye A.

Title : Crystallochemistry of sulfides. Article 2: Crystallochemistry of simple sulfides of the type AX

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, 10, No 2, 121-130, Mar 1955

Abstract : The authors present the results of a survey of the structural data on sulfides of bivalent elements. They discuss the structural type of galenite (PbS), herzenbergite (SnS), nickeline (NiAs), sphalerite (ZnS), wuertzite, millerite (NiS), cuperite (PtS), covelline (CuS), TlSe, realgar (AsS), and compounds close to PbS (NaCl). Nineteen references, including two USSR: G. B. Bokiy, Vvedeniye v kristallokhimiyu (Introduction to crystallochemistry), Moscow University Press, 1954; "Crystalline structures of chemical elements," Vest, Mosk. un., No 5, 1948.

Institution : Chair of Crystallography and Crystallochemistry

Submitted : June 5, 1954

BOKIY, G.B

X-ray diffraction study of cis-tetrachlorodiammoniplatinate.
G. B. Bokii, G. A. Kukina, and M. A. Porai-Koshits.
Izvest. Sektora Platiny i Drug. Blagorod. Metal., Inst. Obshchei i Neorg. Khim. Akad. Nauk S.S.S.R., No. 29, 5–18(1955).—The x-ray patterns of light-yellow *cis*-[Pt-$(NH_3)_2Cl_4$] crystals characterize their structure as prismatic with $a = 6.36 \pm 0.05$, $b = 10.75 \pm 0.05$, $c = 11.20 \pm 0.05$ A., $\beta = 90°57'$, space group C_{2h}^5–$C2/c$ and C_s^4–Cc, $\gamma = 1.955$, $\beta = 1.870$, and $\alpha = 1.855$. Electrons are scattered by the electrostatic potential fields in the crystal lattice, and the scattering power of an atom depends on $(Z - f_x)$, where Z is the at. no. and f_x the scattering factor for x-rays. Since f_x falls further below Z for lighter atoms than for heavier ones, it follows that lighter atoms are relatively better scatterers of electrons than of x-rays. This method was used to yield maps showing both the electron-d. and the distribution of potential in the unit cell. A. P. Kotloby

Bokiy, G. B.

USSR / Structural Crystallography. E-3.

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9237

Author : Bokiy, G.B., Malinovskiy, T.I., Ablov, A.V.
Title : Structure of Dihalogenide-Diamines of Cobalt.

Orig Pub : Kristallografiya, 1956, 1, No 1, 49-52

Abstract : The authors consider the problem of the structure of products of the combination of two amines with halogenide of divalent cobalt. X-ray-diffraction determination is made of the crystalline structure of $COCl_2 \cdot 2H_2NC_6H_4CH_3$. The crystal-optical data are: biaxial crystals, $2V \approx 90^\circ$ indices of refraction are $n_g = 1.701$, $n_m = 1.652$, and $n_p = 1.610$. The lattice periods are: 12.3, b 4.59, c 26.1 A; $\beta 93^\circ 45'$; ρ x-ray 1.55; ρ meas 1.483; Fedorov group 12/a. The photographs were made by the vibration and roentgenogoniometer methods with radiation Mo K_α. The coordinates of the atoms were determined by constructing the

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USSR / Structural Crystallography. E-3

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9237

Abstract : projections and the Patterson sections. The interatomic distances are: Co-Cl 2.24, Co-N 1.92, N-$C_{(1)}$ 1.38, Cl-Cl 3.70, Cl-N 3.40, N-N 3.15 A. The valence angles are: Cl-Co-N 109°, Cl-Co-Cl 111°, N-Co-N 111°, Co-N-$C_{(1)}$ 102°. The structure is molecular. The cobalt atom is in the center of an almost regular tetrahedron, two vertices of which are occupied by chlorine atoms and two by nitrogen atoms. The Co-Cl and Co-N bonds are predominantly covalent. The tetrahedral structure, in the author's opinion should be ascribed also to other products of the type $C.X_2A_2$ of blue color. The authors state that the α and β modifications of the complex compounds Co(2+) (blue and violet) are not cis- and trans-isomers. The violet modifications are probably due to the chain structure with coordination number six.

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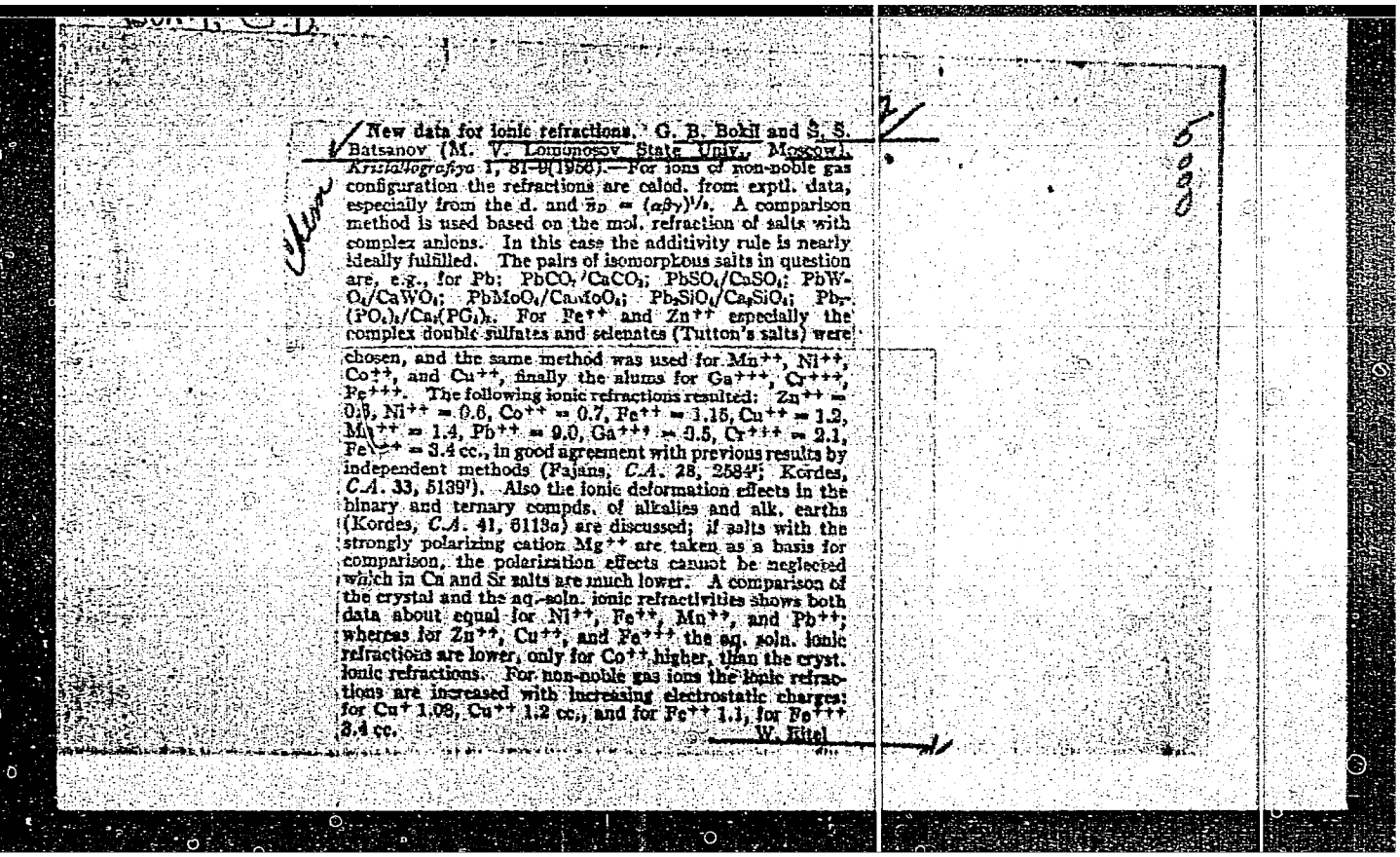
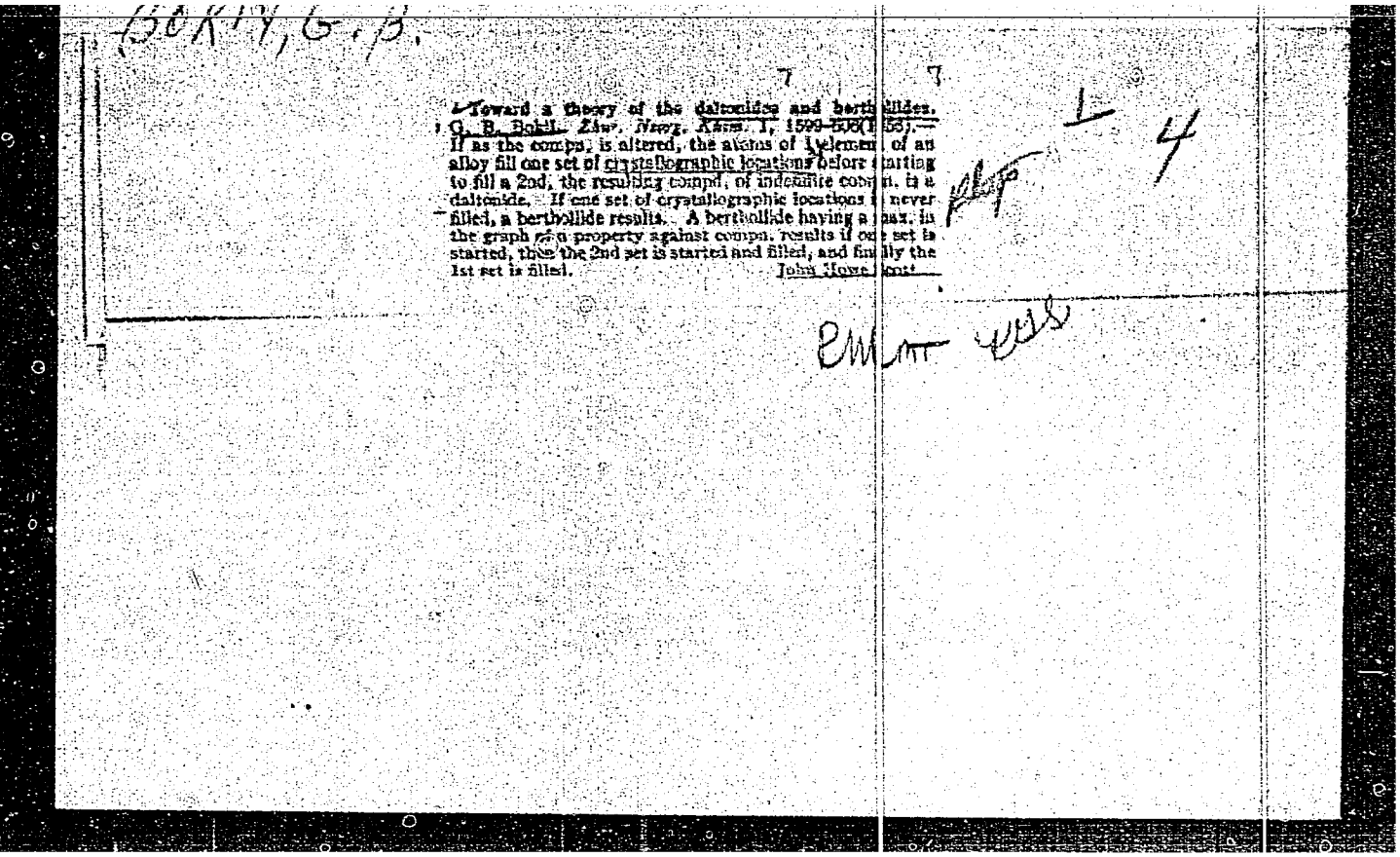
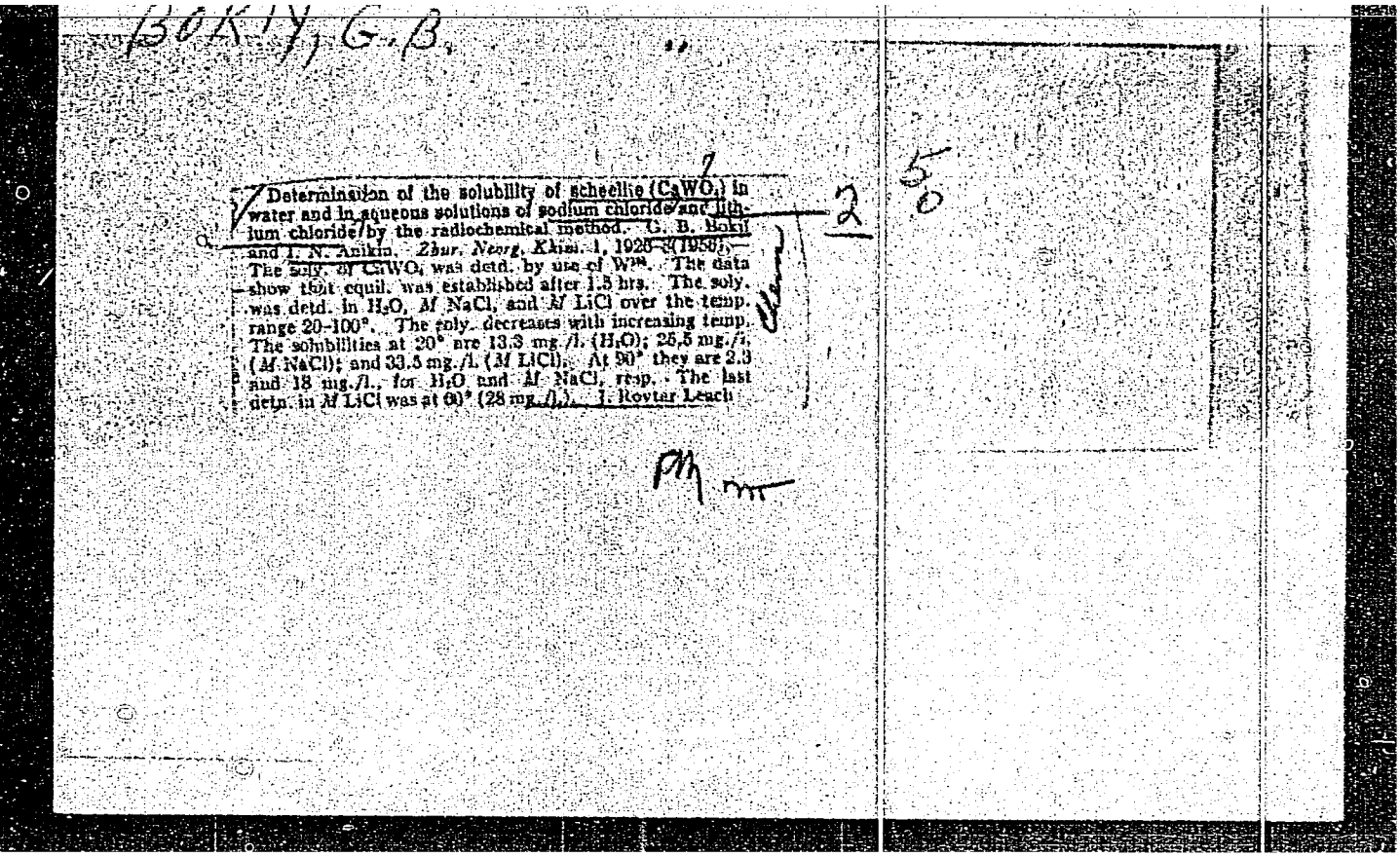


New data for ionic refractions. G. B. Bokii and S. S. Batsanov (M. V. Lomonosov State Univ., Moscow). *Kristallografiya* 1, 81–9(1956).—For ions of non-noble gas configuration the refractions are calcd. from exptl. data, especially from the d. and $\bar{n}_D = (\alpha\beta\gamma)^{1/3}$. A comparison method is used based on the mol. refraction of salts with complex anions. In this case the additivity rule is nearly ideally fulfilled. The pairs of isomorphous salts in question are, e.g., for Pb; $PbCO_3/CaCO_3$; $PbSO_4/CaSO_4$; $PbWO_4/CaWO_4$; $PbMoO_4/CaMoO_4$; Pb_2SiO_4/Ca_2SiO_4; $Pb_3(PO_4)_2/Ca_3(PO_4)_2$. For Fe^{++} and Zn^{++} especially the complex double sulfates and selenates (Tutton's salts) were chosen, and the same method was used for Mn^{++}, Ni^{++}, Co^{++}, and Cu^{++}, finally the alums for Ga^{+++}, Cr^{+++}, Fe^{+++}. The following ionic refractions resulted: Zn^{++} = 0.9, Ni^{++} = 0.6, Co^{++} = 0.7, Fe^{++} = 1.15, Cu^{++} = 1.2, Mn^{++} = 1.4, Pb^{++} = 9.0, Ga^{+++} = 0.5, Cr^{+++} = 2.1, Fe^{+++} = 3.4 cc., in good agreement with previous results by independent methods (Fajans, *C.A.* 28, 2584[1]; Kordes, *C.A.* 33, 5139[7]). Also the ionic deformation effects in the binary and ternary compds. of alkalies and alk. earths (Kordes, *C.A.* 41, 6113a) are discussed; if salts with the strongly polarizing cation Mg^{++} are taken as a basis for comparison, the polarization effects cannot be neglected which in Ca and Sr salts are much lower. A comparison of the crystal and the aq.-soln. ionic refractivities shows both data about equal for Ni^{++}, Fe^{++}, Mn^{++}, and Pb^{++}; whereas for Zn^{++}, Cu^{++}, and Fe^{+++} the aq. soln. ionic refractions are lower, only for Co^{++} higher, than the cryst. ionic refractions. For non-noble gas ions the ionic refractions are increased with increasing electrostatic charges: for Cu^{+} 1.08, Cu^{++} 1.2 cc., and for Fe^{++} 1.1, for Fe^{+++} 3.4 cc. —W. Kitel



BOK'Y, G. B.

Toward a theory of the daltonides and berthollides. G. B. Bokiĭ. *Zhur. Neorg. Khim.* 1, 1599-608(1956).—If as the compn. is altered, the atoms of 1 element of an alloy fill one set of crystallographic locations before starting to fill a 2nd, the resulting compd., of indefinite compn., is a daltonide. If one set of crystallographic locations is never filled, a berthollide results. A berthollide having a max. in the graph of a property against compn. results if one set is started, then the 2nd set is started and filled, and finally the 1st set is filled. John Howe Simmons



BOKIY, G. B.

Determination of the solubility of scheelite ($CaWO_4$) in water and in aqueous solutions of sodium chloride and lithium chloride by the radiochemical method. G. B. Bokii and I. N. Anikin. *Zhur. Neorg. Khim.* 1, 1928–32(1956).—The soly. of $CaWO_4$ was detd. by use of W^{185}. The data show that equil. was established after 1.5 hrs. The soly. was detd. in H_2O, *M* NaCl, and *M* LiCl over the temp. range 20–100°. The soly. decreases with increasing temp. The solubilities at 20° are 13.3 mg./l. (H_2O); 25.5 mg./l. (*M* NaCl); and 33.5 mg./l. (*M* LiCl). At 90° they are 2.3 and 18 mg./l., for H_2O and *M* NaCl, resp. The last detn. in *M* LiCl was at 0° (28 mg./l.). J. Royter Leach

BOKIY, G.B.;KHODASHOVA, T.S.

X-ray analysis of $InF_3 \cdot 3H_2O$. Kristallografiia 1 no.2:197-204 '56.
(MLRA 9:11)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova.
(Indium fluoride crystals)

BOKIY, G.B.

Concept of daltonides and berthollides in view of the atomic theory of crystal structure. Zhur.neorg. khim. 1 no.6:1150-1161 Je '56. (MLRA 9:10)

1.Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova Akademii nauk SSSR.
(Chemistry, Physical and theoretical)

Bokiy, G.B.

USSR / Solid State Physics / Geometric Crystallography E-3

Abs Jour : Ref Zhur - Fizika, No. 5, 1957 No. 11581.

Author : Bokiy, G.B.
Inst
Title : Law of Arrangement of Atoms in Crystals.

Orig Pub : Kristallografiya, Vyp. 5, M., Metallurgizdat, 1956, 25 - 36

Abstract : The essence of the law of arrangement of atoms in a crystal can be stated at follows: the atoms are placed in the crystal space at points of regular systems of Fedorov symmetry space groups. The points correspond to the faces or centers of simple forms of crystals, if these centers are coincident with the singular points of the structure, and particularly with the lattice sites. Each simple form can be represented in the form of a corresponding point group. The multiplicity of the regular systems of points (figures) equals the number of the

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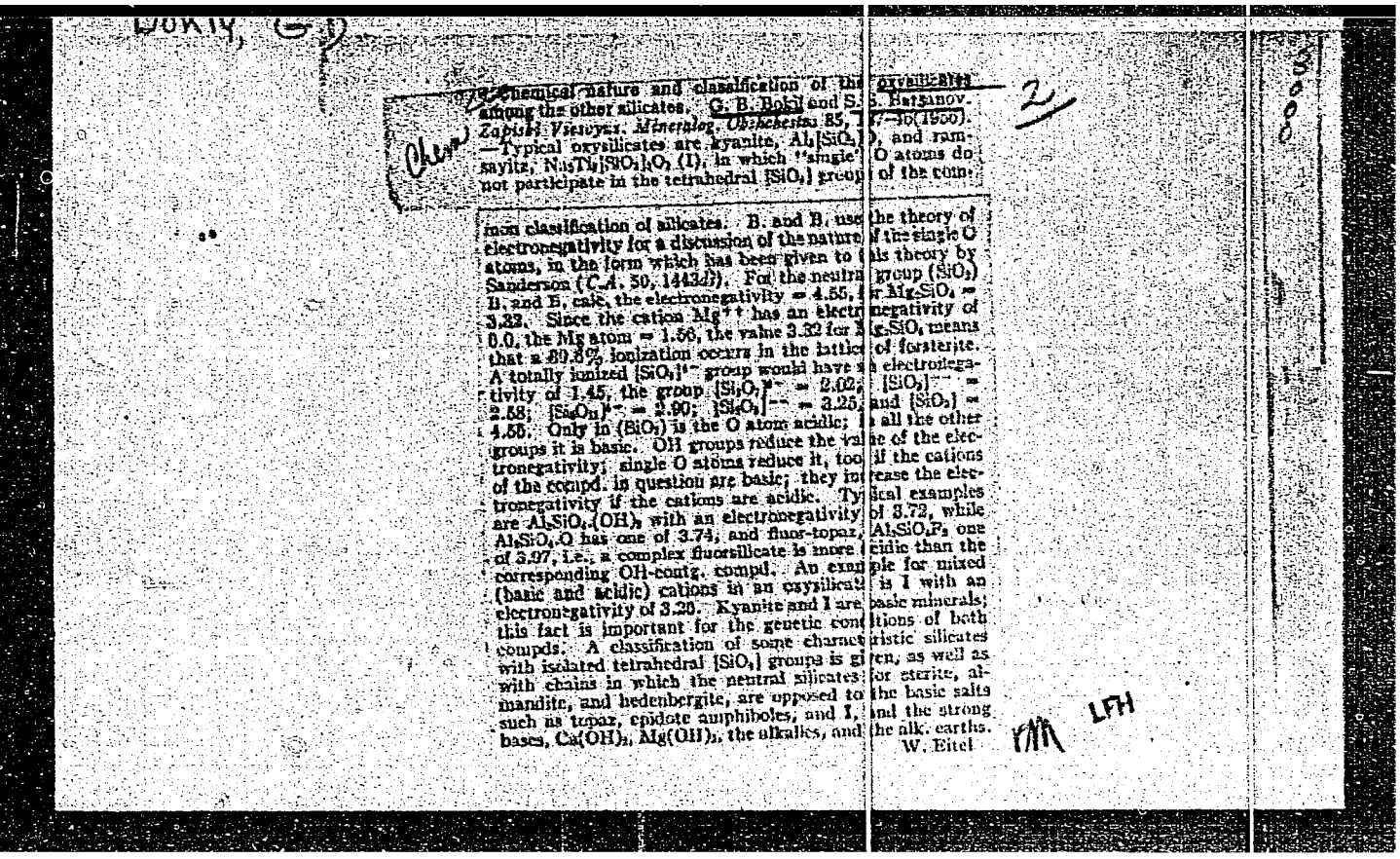
BOKIY, G.B.

Principles in the classification of chemical compound including minerals. Geokhimiia no.6:73-83 '56. (MLRA 10:1)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova. (Geochemistry)

BOKIY, G.B.

E.S.Fedorov and crystallochemistry. Trudy Inst.ist.est.i tekh. 10:19-27 '56. (MLRA 9:12)
(Fedorov, Evgraf Stepanovich, 1853-1919)



...chemical nature and classification of the ... among the other silicates. G. B. Bokii and S. ... *Zapiski Vsesoyuz. Mineralog. Obshchestva* 85, ... —Typical oxysilicates are kyanite, $Al_2[SiO_4]$ ... sayite, $Na_2Ti_4[SiO_4]_4O_2$ (I), in which "single" ... not participate in the tetrahedral $[SiO_4]$ group ... oxysilicates ... S. Barsanov. ... 36 (1950). ...), and ram- ... O atoms do ... of the com-

... mon classification of silicates. B. and B. use ... electronegativity for a discussion of the nature ... atoms, in the form which has been given to ... Sanderson (*C.A.* 50, 1443*d*). For the neutra ... B, and B, calc, the electronegativity = 4.55, ... 3.33. Since the cation Mg^{++} has an electr ... 0.0, the Mg atom = 1.56, the value 3.32 for ... that a 80.8% ionization occurs in the lattic ... A totally ionized $[SiO_4]^{4-}$ group would have ... tivity of 1.45, the group $[Si_2O_7]^{6-}$ = 2.02; ... 2.58; $[Si_6O_{18}]^{12-}$ = 2.90; $[Si_4O_8]^{--}$ = 3.25, ... 4.55. Only in (SiO_2) is the O atom acidic; ... groups it is basic. OH groups reduce the va ... tronegativity; single O atoms reduce it, too ... of the compd. in question are basic; they in ... tronegativity if the cations are acidic. Ty ... are $Al_2SiO_4(OH)_2$ with an electronegativity ... Al_2SiO_4O has one of 3.74, and fluor-topaz, ... of 3.97, i.e., a complex fluorsilicate is more ... corresponding OH-contg. compd. An exam ... (basic and acidic) cations in an oxysilicate ... electronegativity of 3.20. Kyanite and I are ... this fact is important for the genetic con ... compds. A classification of some charact ... with isolated tetrahedral $[SiO_4]$ groups is gi ... with chains in which the neutral silicates ... mandite, and hedenbergite, are opposed to ... such as topaz, epidote amphiboles, and I, ... bases, $Ca(OH)_2$, $Mg(OH)_2$, the alkalies, and ... the theory of ... f the single O ... is theory by ... group (SiO_2) ... r Mg_2SiO_4 = ... negativity of ... g_2SiO_4 means ... of forsterite. ... electronega- ... $[SiO_4]^{----}$ = ... and $[SiO_2]$ = ... all the other ... e of the elec- ... if the cations ... rease the elec- ... ical examples ... of 3.72, while ... $Al_2SiO_4F_2$ one ... cidic than the ... ple for mixed ... is I with an ... basic minerals; ... itions of both ... ristic silicates ... en, as well as ... for sterite, al- ... the basic salts ... and the strong ... the alk. earths.

W. Eitel

USSR/ Physical Chemistry - Crystals

B-5

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 7269

application of successive approximations in carrying out a Fourier analysis. The structure of chkalovite appears to be derived from that of β-cristobalite. The filling of 2/3 of the total number of Lavsov polyhedra by Na atoms and the substitution of 1/3 of the Si atoms by Be atoms lead to a tripling of the a and b periods in chkalovite compared with the edge lengths of β-cristobalite. This leads to a small displacement of the atomic coordinates from their ideal positions.

Card 2/2

15-57-7-9373

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7, pp 91-92 (USSR)

AUTHOR: Bokiy, G. B.

TITLE: The Crystallochemical Principles in the Classification of the Sulfides and Arsenides (Kristallokhimicheskiye printsipy sistematiki sul'fidov i arsenidov)

PERIODICAL: Uch. zap. Mosk. un-ta, 1956, Nr 176, pp 233-240

ABSTRACT: Since the appearance of experimental crystal chemistry in the systematic treatment of minerals, the chemical composition and the structure of the mineral have been taken into account. However, the basis for systematic classification is not the chemical composition but the crystalline structure of minerals, inasmuch as different structures exist for similar compositions (e.g., diamond-graphite, pyrite-marcasite, etc.). The crystallochemical classification of silicates, based

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The Crystallochemical Principles (Cont.)

primarily on structure, demonstrates the justification of this principle. However, one cannot mechanically transfer the principle of classification of the silicates to the sulfides, inasmuch as the sulfides are generally solid phases of varying composition. Such phases have two fundamentally different types of structures: 1) substitution of the atoms of one element for those of another according to the atom-for-atom rule, forming solid solutions by substitution; and 2) insertion of atoms of one element into interspaces between atoms of another element, forming solid solutions by introduction (and by subtraction). In the ranges of mineral composition of the sulfides, these two types are incorrectly represented by stoichiometric formulas. A classification of chemical combinations, including minerals, should be based on the periodic law of D. I. Mendeleev. Inasmuch as the valence of nonmetallic elements, in going from one subgroup of the Mendeleev table to another, varies more sharply than does the valence for metals, classes of chemical combinations should be segregated according to

Card 2/3

The Crystallochemical Principles (Cont.)

type of anion. On this principle, the class of sulfides, selenides, and tellurides should be differentiated from the class of arsenides and similar combinations. Sulfo-salts fall into a separate subdivision in which anions of both types are present. The author recommends that the separation into mineral classes be based on nearness to or identity with structural types. As an illustration he furnishes a table of the structural types of sulfides, selenides, and tellurides of metals. The author notes that an intelligent classification of sulfides can be developed only by study of the structural diagrams of the appropriate systems with subsequent X-ray analysis of the solid phases of varying composition.

Card 3/3 A. S. Povarennykh

BOKIY, G. B. and KUKINA, G. A.

Institute of General and Inorganic Chemistry, Moscow-"Crystal Chemistry of Complex Divalent Platinum Compounds" (Section 16-2) a paper submitted at the General assembly and International Congress of Crystallography, 10-19 Jul 57, Montreal, Canada.

C-3,800,189

BOKIY, G.B.; KOZLOVA, O.G.

Crystallographic criterions for selecting fluorspars used for growing artificial crystals of optical fluorite. Kristallografiia 2 no.1:158-165 '57. (MIRA 10:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Fluorite) (Crystallography)

Bokiy, G.B.

AUTHOR: Bleidelis, Ya.Ya. and Bokiy, G.B. 70-2-13/24

TITLE: The crystal structure of the trans-diamine thiocyanate of bivalent platinum (Kristallicheskaya struktura trans-diammindirodanida dvukhvalentnoy platiny)

PERIODICAL: "Kristallografiya" (Crystallography), 1957, Vol.2, No.2, pp. 281-283 (U.S.S.R.)

ABSTRACT: Crystals of trans-$\left[Pt(NH_3)_2(SCN)_2\right]$, recrystallised from acetone, were monoclinic with refractive indices for white light, $n_\gamma = 1.990$, $n_\beta = 1.737$, $n_\alpha = 1.625$. The unit cell dimensions were $a = 7.31$, $b = 8.27$, $c = 13.27$ KX (all $\pm$ 0.05 KX) and $\beta = 90^\circ$ approx. The space group was uniquely given by the extinctions as $P2_1/n$. $d_{obs.} = 2.90$, $Z = 4$ and $d_{calc.} = 2.88$. h0l (103 independent reflections) and 0kl (76 independent reflections) Patterson and Fourier projections were made giving the atomic co-ordinates (x, y, z) as:

Pt, (-0.073, 0.184, 0.217); S_I, (-0.206, 0.030, 0.128);

Card 1/2 S_{II}, (0.193, 0.333, 0.309); NH_{3I}, (-0.130, 0.135, 0.360);

NH_{3II}, (0.131, 0.230, 0.081); C_I, (-0.354, 0.154, 0.104);

70-2-13/24

The crystal structure of the trans-diammine thiocyanate of bivalent platinum. (Cont.)

N_I, (-0.475, 0.256, 0.083); C_{II}, (0.344, 0.215, 0.354); N_{II}, (0.467, 0.115, 0.392). The reliability coefficients were R_{xz} = 0.21, R_{yz} = 0.30. Distances from the Pt atom were, S_I, 2.26; S_{II}, 2.27; NH_{3I}, 2.13 and NH_{3II}, 2.10 KX.

Acknowledgments to M.A. Poray-Koshits.

Card 2/2 There are 1 figure, 1 table and 1 Slavic reference.

ASSOCIATION: Institute of Chemistry, Latvian Ac.Sc. (Institut Khimi AN Latviyskoy SSR)

SUBMITTED: January 18, 1957.

AVAILABLE: Library of Congress

AUTHOR: Bokiy, G.B. and Kukina, G.A. 70-3-13/20

TITLE: Crystal chemistry of complex divalent platinum compounds. (Kristallokhimiya kompleksnykh soyedineniy dvukhvalentnoy platiny (effekt transvliyaniya v kristallicheskikh veshchestvakh)

PERIODICAL: "Kristallografiya" (Crystallography), 1957, Vol.2, No.3, pp. 400 - 407 (U.S.S.R.)

ABSTRACT : During recent years at the Laboratory of Crystal Chemistry, Institute of General and Inorganic Chemistry named after N.S. Kurnakov, Academy of Sciences, USSR, an X-ray structure investigation was carried out on a number of complex compounds which belong to the chloramine series of quadrivalent and divalent platinum. A review of the crystal chemistry of platinum chloramine was made by G.B. Bokiy in his works devoted to the final results of the research.

X-ray structure investigations confirmed the types of geometrical isomers, which were attributed to them owing to classic stereochemic methods. The formulation of the stereochemistry of inorganic compounds was the result of investigations on complex cobalt and platinum compounds.

It is in complex platinum compounds that I.I. Chernyaev found 'trans-directing influence' (1926).

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Crystal chemistry of complex divalent platinum compounds. (Cont.)

In 1951, Bokiy G.B. et al. made the first attempt to obtain the quantitative characteristics of trans-influence by employing the electronographic method in investigating the structure of potassium trichloroamminoplatinites $K[PtNH_3Cl_3]$. The distance obtained along NH_3 - Pt - Cl_I ($Pt - Cl_I$ = 2.32 kX.) proved to be somewhat smaller than the distance along Cl_{II} - Pt - Cl_{II} ($Pt - Cl_{II}$ = 2.35 kX.), which we attributed to the result of the trans-influence existing in the molecule. Further, quadrivalent platinum compounds cis-$[Pt(NH_3)_2Cl_4]$ and the face isomer of $K_2[Pt(NO_2)_3Cl_3]$ were investigated. We failed, however, to obtain the quantitative characteristics of trans-influence; but we succeeded in proving that the nitro group in the quadrivalent platinum compounds possesses a weaker trans-influence than chloride and bromine. This was clearly shown by optical methods.

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After establishing this fact we returned to the investigation on divalent platinum compounds of the series of chloroamine. We also made a study of compounds in which chlorine

Crystal chemistry of complex divalent platinum compounds. (Cont.)

atoms were substituted by bromine and an addendium, possessing the strongest trans-influence, namely the ethylene group.

An X-ray structure investigation on $K[PtNH_3Cl_3].H_2O$ and $K[PtNH_3Br_3].H_2O$ was carried out. The results of goniometric and optical investigations showed that the compounds are isomorphous and orthorhombic.

The dimensions of the unit cell were determined from oscillation photographs and X-ray goniometric diagrams. For $K[PtNH_3Cl_3].H_2O$, a = 20.88 ± 0.04, b = 8.10 ± 0.02, c = 13.55 ± 0.02 kX.; N = 12; for $K[PtNH_3Br_3].H_2O$, a = 21.75 ± 0.04, b = 8.37 ± 0.02, c = 14.42 ± 0.02 kX; N = 12, space group D_{2h}^{14} - Pbna.

The co-ordinates of Pt, Br, K and NH_3 were found by the calculation of projections of inter-atomic functions on plane XY and XZ, and of electron-density projections on corresponding planes. (All of the data were obtained from the reciprocal-lattice photographs with Mo Kα radiation.)

Card 3/7

In contra-distinction to the structure of the anhydrous

Crystal chemistry of complex divalent platinum compounds. (Cont.)

salt, all the $K[PtNH_3Cl_3].H_2O$ complexes are inclined to [illegible] at approximately 26^0.

The threefold period (for $K[PtNH_3Cl_3]$, a = 17.6, b = 8.84, c = 4.19 kX., N = 4) is caused by the presence of water molecules, which displace potassium atoms from the inversion centre. This accounts for the increase of the period along X by approximately 3 kX. Potassium atoms are arranged in trigonal prisms and their co-ordination number is 6. The presence of water molecules in the outer region also influences the intermolecular inter-atomic distances.

At the beginning of 1954, we undertook an investigation on Zeise salts, $K[PtC_2H_4Cl_3].H_2O$ and $K[PtC_2H_4Br_3].H_2O$, to determine Pt - Cl and Pt - Br distances in case ethylene labilizes the chlorine and bromine, and also to find how carbon atoms are arranged in relation to the group $[PtCl_3]$ and $[PtBr_3]$.

The crystals belong to the monoclinic system, as was found by Jorgensen in 1900. Goniometric and optical investigations have shown that $K[PtC_2H_4Cl_3].H_2O$ and $K[PtC_2H_4Br_3].H_2O$ are isomorphous. The unit cells are determined by oscillation

Crystal chemistry of complex divalent platinum compounds. (Cont.)

photographs.

For $K[PtC_2H_4Cl_3].H_2O$, a = 10.85 ± 0.02, b = 8.53 ± 0.02, c = 4.81 ± 0.01 kX., β = 97°, N = 2, for $K[PtC_2H_4Br_3].H_2O$, a = 11.38 ± 0.02, b = 8.78 ± 0.02, c = 5.01 ± 0.01 kX., β = 97°, N = 2, space groups C_2^2 - $P2_1$. The atomic co-ordinates are obtained from projections of inter-atomic functions on XY and XZ and from the projection of electron-density on XZ. At the end of 1954 there was published an article by Wunderlich and Meller on the crystal structure of Zeise salts. The atomic co-ordinates in this article were definitely at odds with the authors' article, but in 1955 Wunderlich and Meller published a paragraph with corrected co-ordinates, the latter being in agreement with the authors' results.

To determine with greater precision the distance in case of an addendum with a strong trans-influence - the ethylene group - the authors investigated an isomorphous compound with bromine and obtained good results. The analysis of the electron-density projection on plane XZ made it possible to determine the carbon atomic co-ordinates and to find that the plane of the ethylene molecule itself is perpendicular to the plane of the

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Crystal chemistry of complex divalent platinum compounds. (Cont.)

group $[PtBr_3]$, whereas carbon atoms are almost symmetrical to platinum atoms.

In this way co-ordinates of all the atoms were obtained and inter-atomic distances were calculated. Two of the bond lengths $Pt - Cl_{II}$ and $Pt - Br_{II}$ are normal (2.26 and 2.42 kX.); the third bond length $Pt - Cl_I$ and $Pt - Br_I$, which is in the trans position to the ethylene molecule, is 2.40 and 2.50 kX. respectively.

As the strong trans-influence of the ethylene molecule is well known, the increase of bond lengths $Pt - Cl_I$ and $Pt - Br_I$ seems quite natural.

Card 6/7 Proceeding from crystal chemistry data it is possible to determine the position of hydrogen atoms. There are two variants of the arrangement of the flat group C_2H_4 in the molecule $[PtC_2H_4Cl_3]$. In the first variant this plane, when continued, passes through the line $Pt - Br_I$; in the second it is pependicular to the line. The difference between the inter-atomic distances obtained for these two variants speaks definitely in

Crystal chemistry of complex divalent platinum compounds. (Cont.)

favour of the second variant.

There are 2 figures and 19 references, 16 of which are Slavic.

ASSOCIATION: Institute of General and Inorganic Chemistry imeni N.S. Kurnakov (Institut Obshchey i Neorganicheskoy Khimii im. N.S. Kurnakova)

SUBMITTED: March 6, 1957

AVAILABLE: Library of Congress

Card 7/7

Bokiy, G.B.

AUTHOR: Bokiy, G.B. and Parpiyev, N.A. 70-5-23/31

TITLE: X-ray Structural Investigation of Crystals of $[Ru(NH_3)_4(NO)(OH)]Cl_2$ (Rentgenostrukturnoye issledovaniye kristallov $[Ru(NH_3)_4(NO)(OH)]Cl_2$)

PERIODICAL: Kristallografiya, 1957, Vol.2, No.5, pp. 691 - 693 (USSR)

ABSTRACT: Crystals of $[Ru(NH_3)_4(NO)(OH)]Cl_2$ when measured by optical goniometry had axial ratios a:b:c of 1.535 : 1 : 0.722 and $\beta = 101^{\circ}15'$. The refractive indices were 1.830, 1.708 and 1.661. The unit cell dimensions determined using a retigraph were $a = 11.48 \pm 0.02$, $b = 7.44 \pm 0.05$ and $c = 10.75 \pm$ $\pm$ 0.02 A. The observed density was 2.112 giving $Z = 4$ and a calculated density of 2.126. The extinctions were characteristic for the space group C2. Intensities were measured from Mo radiation pictures from a retigraph and Cu radiation pictures from a Weissenberg camera by visual comparison with a standard scale. The three Patterson projections on to xOz, xyO and Oyz were constructed, giving the locations of the heavy atoms and the xOz and xyO Fourier syntheses were made with reliability factors of 0.224 and 0.207, respectively. The atomic position parameters were found as follows: Ru (C.250, 0, 0.250);

Card1/2

X-ray Structural Investigation of Crystals of $[Ru(NH_3)_4(NO)(OH)]Cl_2$. 70-5-23/31

Cl_I (0.006, 0.500, 0.365); Cl_{II}(0.375, 0.500, 0.146); $(NH_3)_I$ (0.149, 0.210, 0.126); $(NH_3)_{II}$(0.149, -0.210, 0.126); $(NH_3)_{III}$ (0.349, 0.210, 0.376); $(NH_3)_{IV}$ (0.349, -0.210, 0.376); (OH) (0.375, 0.000, 0.146); N (of NO group) (0.125, 0.000, 0.365); O (of NO) (0.058, -0.093, 0.397). The Ru atom is octahedrally co-ordinated with the 4 (NH_3) groups in a planar configuration and the NO and OH groups in the trans positions. The Ru - N - O bond angle is about 150°. The Cl ions have a co-ordination number of 12, 8 (NH_3) groups being closer than the 4 OH or NO groups.
There are 1 table and 3 references, 1 of which is Slavic.

ASSOCIATION: Moscow State University im. M. V. Lomonosov (Moskovskiy Gosudarstvennyy Universitet im. M. V. Lomonosova)

SUBMITTED: December 4, 1956.

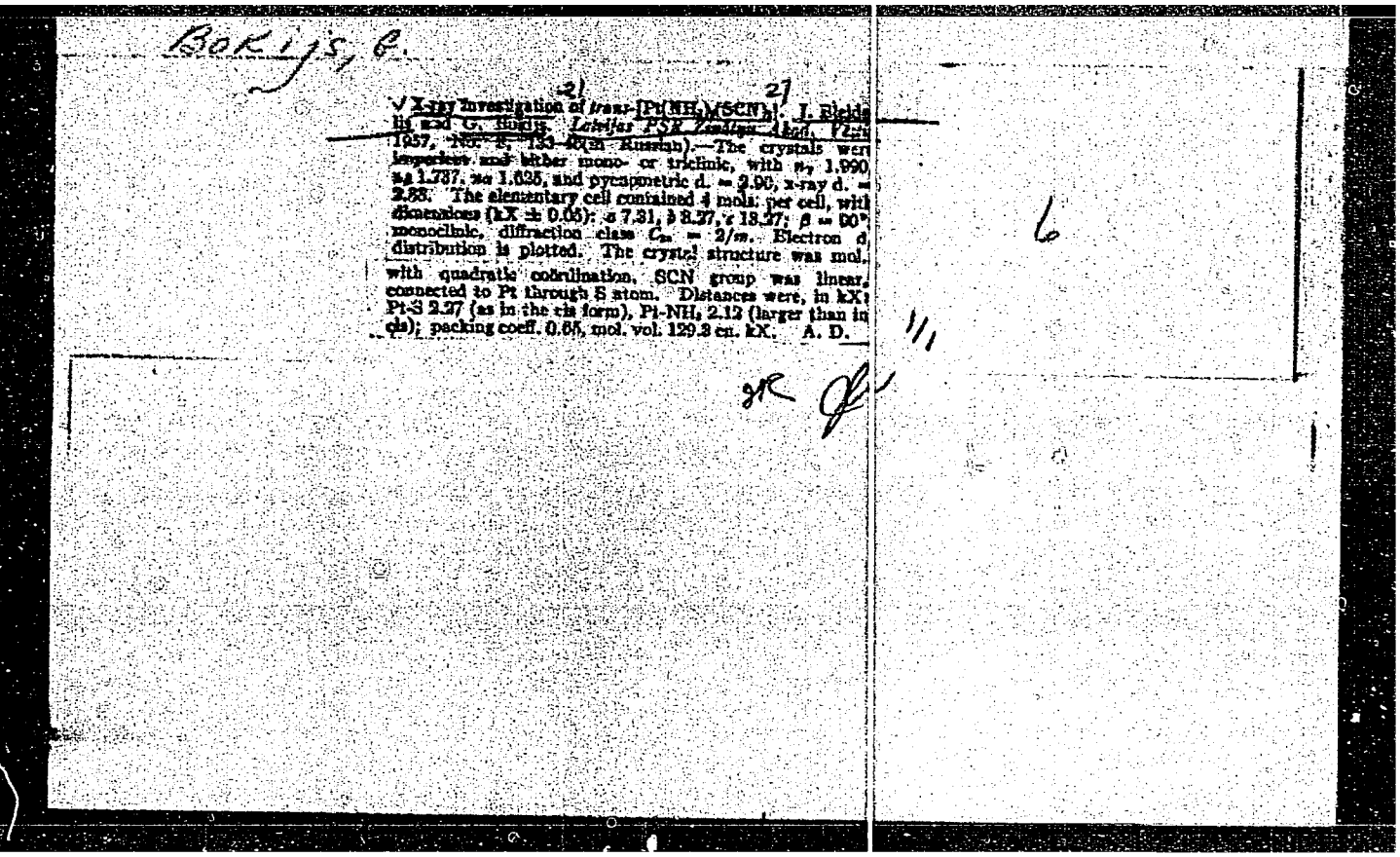
AVAILABLE: Library of Congress.

Card 2/2

Bokiy, G.B.

PAFRIYEV, N.A.; BOKIY, G.B.

X-ray analysis of ammonium tetrachlorohydroxynitrosoruthenate crystals. Zhur. neorg. khim. 2 no.8:1972-1974 Ag '57. (MIRA 11:3)
(Ammonium compounds--Spectra)



Bokiy, G.

X-ray investigation of *trans*-$[Pt(NH_3)_2(SCN)_2]$. I. Fields and G. Bokiy. *Latvijas PSR Zinatnu Akad. Vestis* 1957, No. 8, 133-40(in Russian).—The crystals were lenticular and either mono- or triclinic, with n_g 1.990, n_m 1.737, n_p 1.635, and pycnometric d. = 2.90, x-ray d. = 2.85. The elementary cell contained 4 mols. per cell, with dimensions (kX ± 0.05): a 7.31, b 8.27, c 18.27; β = 90°; monoclinic, diffraction class C_{2h} = $2/m$. Electron d. distribution is plotted. The crystal structure was mol. with quadratic coördination. SCN group was linear, connected to Pt through S atom. Distances were, in kX: Pt-S 2.37 (as in the cis form), Pt-NH_3 2.12 (larger than in cis); packing coeff. 0.65, mol. vol. 129.2 cm. kX. A. D.

BOKIY, G.B.; SHATALOV, Ye.T.

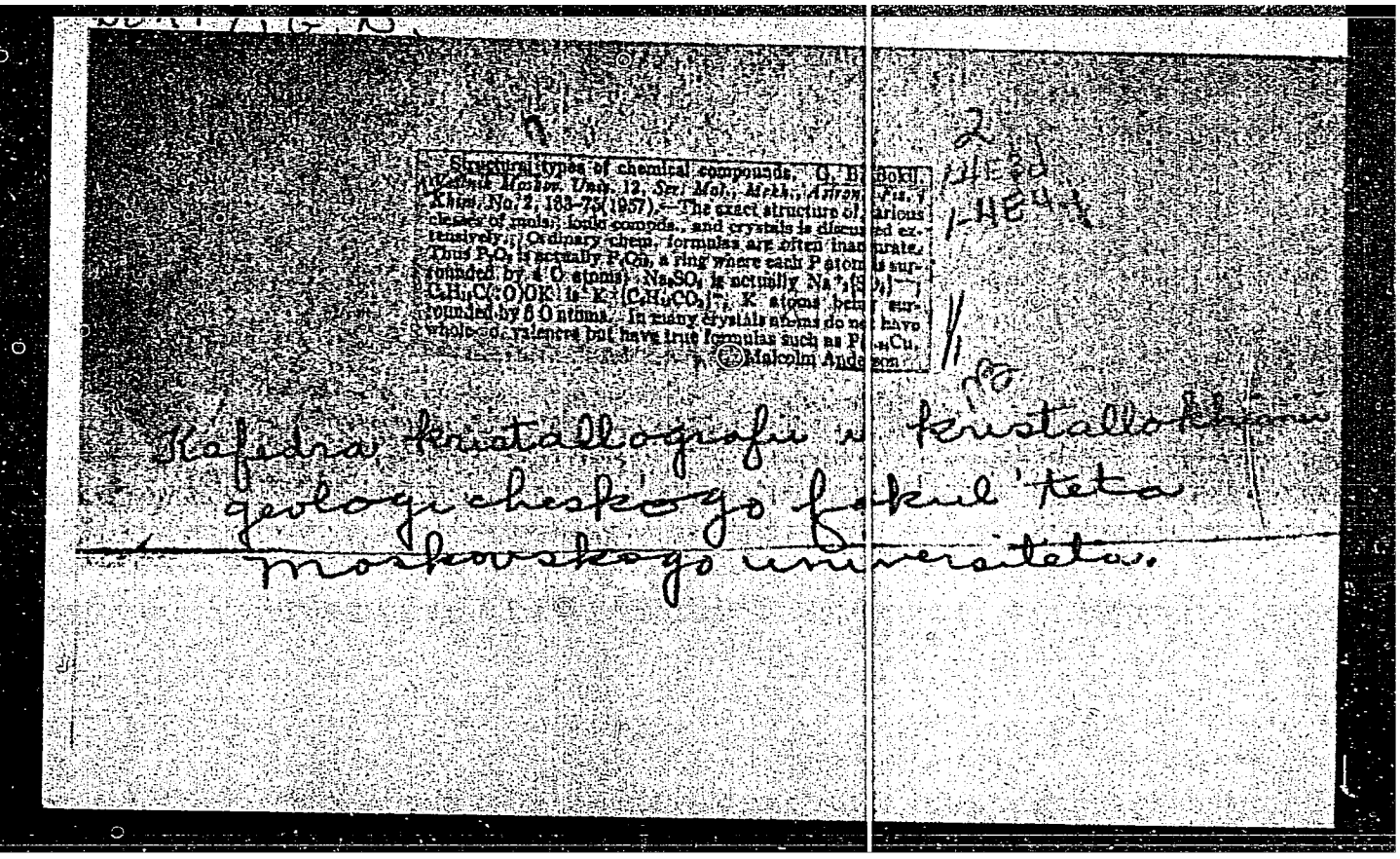
Geological excursion to the silver and lead ore deposits of Mexico. Vest. Mosk. un. Ser. biol., pochv., geol., geog. 12 no.1:47-55 '57. (Mexico--Silver ores) (Mexico--Lead ores) (MLRA 10:11)

Bokiy, G. B.

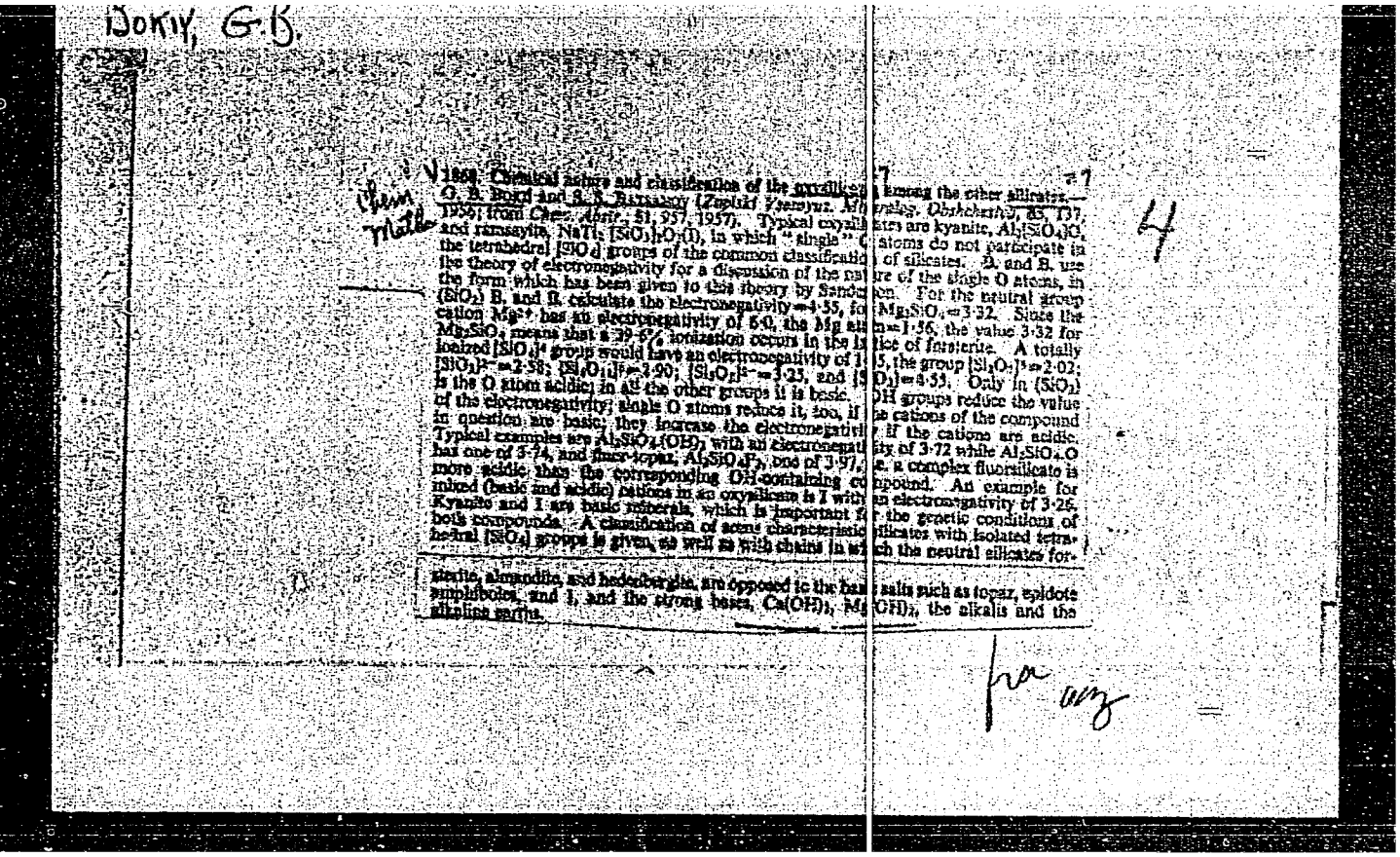
BATSANOV, S.S.; BOKIY, G.B.

Crystallographic and optical determination of the structure of platinum complex compounds. Vest.Mosk.un.Ser.mat.mekh., astron., fiz., khim. 12 no.2:3-14 '57. (MIRA 10:12)

1.Kafedra kristallografii i kristallokhimii geologicheskogo fakul'teta Moskovskogo universiteta.
(Platinum compounds)



Kafedra kristallografii i kristallokhimii
geologicheskogo fakul'teta
Moskovskogo universiteta.



Dokiy, G.B.

Chem Matter

4

1960. Chemical nature and classification of the oxysilicates. G. B. Bokii and S. A. Kazanskiy (*Zaphiski Vsesoyuz. Mineralog. Obshchestva*, 85, 137, 1956; from *Chem. Abstr.*, 51, 957, 1957). Typical oxysilicates are kyanite, $Al_2[SiO_4]O$, and ramsayite, $Na_2Ti_2[SiO_4]_2O_2$ (I), in which "single" O atoms do not participate in the tetrahedral $[SiO_4]$ groups of the common classification of silicates. B. and B. use the theory of electronegativity for a discussion of the nature of the single O atoms, in the form which has been given to this theory by Sanderson. For the neutral group (SiO_2) B. and B. calculate the electronegativity = 4·55, for Mg_2SiO_4 = 3·32. Since the cation Mg^{++} has an electronegativity of 6·0, the Mg atom = 1·56, the value 3·32 for Mg_2SiO_4 means that a 39·5% ionization occurs in the lattice of forsterite. A totally isolated $[SiO_4]^{4-}$ group would have an electronegativity of 1[illegible]5, the group $[Si_2O_7]^{6-}$ = 2·02; $[SiO_3]^{2-}$ = 2·58; $[Si_4O_{11}]^{6-}$ = 2·90; $[Si_2O_5]^{2-}$ = 3·25, and [S[illegible]O$_3$] = 4·55. Only in (SiO_2) is the O atom acidic; in all the other groups it is basic. OH groups reduce the value of the electronegativity; single O atoms reduce it, too, if the cations of the compound in question are basic; they increase the electronegativity if the cations are acidic. Typical examples are $Al_2SiO_4(OH)_2$ with an electronegativity of 3·72 while Al_2SiO_4O has one of 3·74, and finer-topaz, $Al_2SiO_4F_2$, one of 3·97, i.e. a complex fluorsilicate is more acidic than the corresponding OH-containing compound. An example for mixed (basic and acidic) cations in an oxysilicate is I with an electronegativity of 3·26. Kyanite and I are basic minerals, which is important for the genetic conditions of both compounds. A classification of acens characteristic [illegible]silicates with isolated tetrahedral $[SiO_4]$ groups is given, as well as with chains [illegible]ch the neutral silicates for-

[illegible]nesite, almandite, and hedenbergite, are opposed to the basic salts such as topaz, epidote amphiboles, and I, and the strong bases, $Ca(OH)_2$, $Mg(OH)_2$, the alkalis and the alkaline earths.

fra wg

BOKIY, G.B.; BATSANOV, S.S.

Refractometric determination of silicate structure. Zap. Vses. min. ob-va 86 no.4:421 '57. (MIRA 11:1)
(Silicates) (Refractometry)

BOKIY, G.B.; PLUSNINA, I.I.

Infrared absorption spectra of cyclosilicates in the wave length interval; determination of silicate structure by their infrared spectra. Nauch. dokl. vys. shkoly; geol.-geog. nauki no.3:116-122 '58. (MIRA 12:1)

1.Moskovskiy universitet, geologicheskiy fakul'tet, kafedra kristallografii.
(Silicates--Spectra) (Spectrum, Infrared)

BELOV, N.V.; BELYAYEV, L.M.; BOKIY, G.B.; BRONNIKOVA, Ye.G.; VAYNSHTEYN, B.K.; ZHDANOV, G.S.; IVERONOVA, V.I.; KITAYGORODSKIY, A.I.; PINSKER, Z.G.

Fourth International Congress of Crystallographers. Kristallografiia 3 no.2:250-260 '58. (MIRA 11:6)
(Crystallography—Congresses)

SOV/70-3-6-20/25

AUTHORS: Plyusnina, I.I. and Bokiy, G.I.

TITLE: Infra-red Reflection Spectra for Ring Silicates in the Wavelength Interval 7 - 15 μ (Infrakrasnyye spektry otrazheniya kol'tsevykh silikatov v intervale dlin voln 7 - 15 μ)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 6, pp 752 - 756 (USSR)

ABSTRACT: Infra-red reflection spectra were measured in the range 7 - 15 μ for slices parallel and perpendicular to the main symmetry axis for single crystals of the minerals: eudialite, catapleite, cordierite, dioptase, vorobevite, beryl, aquamarine and tourmaline. (Most of these are reproduced.) Qualitative discussion of the features of the spectra follows. Catapleite and eudialite are compared. For catapleite, cut perpendicular to the optic axis, the first main band of the spectrum is a doublet and for the slice cut parallel to the optic axis a weakly characterised doublet. For eudialite the similar band for the slice perpendicular to the optic axis is a doublet, but for the slice parallel to the optic axis it is a triplet. The second main band in the region of 13-14 μ in both catapleite and eudialite for the slices perpendicular to the optic axis is almost

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Infra-red Reflection Spectra for Ring Silicates in the Wavelength Interval 7 - 15 μ

twice as intense as for the slices parallel to the optic axis but its position (wavelength) is the same in both cases. Similar kinds of observations are made for the other minerals but no structural or other conclusions are drawn. There are 4 figures, 1 table and 7 references, 3 of which are Soviet and 4 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: August 29, 1958

30(7)

AUTHOR: Bokiy, G. B., Corresponding Member, AS USSR

SOV/30-58-11-31/48

TITLE: Soviet Scientists on the Exposition (Sovetskiye uchenyye o vystavke)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 11, pp 108-109 (USSR)

ABSTRACT: The author's particular field of interest, the chemistry of crystals, was given rather little attention in the national pavilions. He mentions the large-scale model of the crystal structure of vitamin B 12 which was exhibited in the British pavilion. It was built by the British Academician Dorotti Khochkin who is well-known and respected in the USSR from some lectures held there. In the Palace of Sciences all chemical disciplines were grouped together in the Section "The Molecule". Problems of chain reaction were also shown here which were dealt with by the work of Nobel prize winner N. N. Semenov, Academician, and his school. The article goes on to mention the unique apparatus displayed in connection with the work on catalysis done by A. A. Baladin, Academician, S. Z. Roginskiy, Corresponding Member, AS USSR, Professor

Card 1/2

Soviet Scientists on the Exposition

SOV/30-58-11-31/48

N. I. Kobozev and others. In the section "The Crystal" the models of crystals were exhibited the structures of which had been determined by N. V. Belov, Academician and his school. Furthermore the big horizontal electron defraction pattern of the Institut kristallografii Akademii nauk SSSR (Institute of Crystallography, AS USSR) type is mentioned which was exhibited in this section. The author winds up by saying that the Soviet exhibits would have been much more impressive if the crystals of the artificial piezo-electric quartz produced by Soviet scientists had also been displayed. There is 1 figure.

Card 2/2

BOKIY, G.B.; BATSANOV, S.S.

Effect of the degree of ionization on bond energy. Zap. Vses. min. ob-va 87 no.2:223-224 '58. (MIRA 11:9)

1. Deystvitel'nyy chlen Vsesoyuznogo mineralogicheskogo obshchestva (for Bokiy).
(Chemical bonds) (Ionization)

BOKIY, G., (Moscow)

(probably Georgiy Borosovich BOKIY)
"The Importance of Crystal Chemical Investigation for Coordination Chemistry"
paper presented
paper submitted for the Symposium on Chemistry of Coordination Compounds, Allahabad, India, 7-8 Feb 1959.

BOKIY, G.B.; ATOVMYAN, L.O.; AN_PU, VAN; KUKINA, GALINA ALEKSANDROVNA; KHODASHOVA, L.T.S.

"New Data on the Crystall Chemistry of Complex Compounds of Ruthenium, Osmium and Platin"

a report presented at Symposium of the International Union of Crystallography Lenningrad 21-27 May 1959

SO: B 3,135, 471 28 July 1959

GEORGIY BORISOVICH BOKIY

NIKOLAY VASILYEVICH BELOV; GEORGIY BORISOVICH BOKIY; ILLARION ILLARIONOVICH SHAFRANOVSKIY

"IN MEMORIUM OF S.S. [illegible]"

A Report presented at Symposium of the International Union of Crystallography Leningrad, 21-27 May 1959

SO; B,3135,471 26 July 1959

5(4)

AUTHORS: Bokiy, G. B., Sokol, V. I.

SOV/78-4-1-15/48

TITLE: The Determination of the Structure f Complex Compounds of Bivalent Palladium by a Crystallo-optical Method (Opredeleniye stroyeniya kompleksnykh soyedineniy dvukhvalentnogo palladiya kristalloopticheskim metodom)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 1, pp 74-78 (USSR)

ABSTRACT: The connection of the crystallo-optical properties with the inner structure of the bivalent palladium complexes was investigated. For the first time the dispersion of the refraction index of bivalent palladium complex compounds was measured. From the data on the dispersion of the refraction index and the density the molecular and coordinative refraction for λ_∞ was calculated and is shown in table 2. The method of determining the geometrical structure of the trans-compounds $Pd(NH_3)_2Cl_2$ and $Pd(NH_3)_2(NO_2)_2$ was investigated by the coordinative refraction. The geometrical structure of the compound $[Pd(NH_3)_4][Pd(NO_2)_2Cl_2]$, as yet unknown, was also de-

Card 1/2

The Determination of the Structure of Complex Compounds of Bivalent Palladium by a Crystallo-optical Method

termined by coordinative refraction. The comparison of the coordinative refractions of bivalent and tetravalent platinum with palladium is shown in table 6. In complex palladium compounds the amine group is connected less steadily to palladium than the nitrito grop. The complex compounds of bivalent palladium, which contain nitrito groups as addendum, are similar to the complex compounds of bivalent platinum. The trans-effect in bivalent platinum complex compounds is as strong as in bivalent palladium complex compounds. There are 7 tables and 6 references, 3 of which are Soviet.

SUBMITTED: October 2, 1957

5(2) 05855

AUTHORS: Parpiyev, N.A., Bokiy, G.B. SOV/78-4-11-8/50

TITLE: The Structure of the Crystals of Hydroxo-nitroso-tetramine Ruthenium Chloride

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2452-2459 (USSR)

ABSTRACT: The compound $[Ru(NO)(OH)(NH_3)_4]Cl_2$ was supplied by V.I. Goremykin. The resultant goniometric values of the monocrystals are listed in table 1. The compound is diamagnetic, and its magnetic susceptibility was determined by V.I. Belova at the Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N.S. Kurnakov of the Academy of Sciences, USSR). The piezoelectric effect of the crystals was measured by V.A. Koptsik at the fizicheskiy fakul'tet MGU (Physical Department of Moscow State University). The lattice constants were determined by X-ray analysis. The crystals belong to the space group C2. For the X-ray analysis, the authors took radiographs of the zero-contour line with the help of a KFOR camera with molybdenum radiation

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The Structure of the Crystals of Hydroxo-nitroso-tetramine Ruthenium Chloride

and an RGNS camera with Cu radiation. Table 2 contains experimental and calculated values. In order to find the general feature of the structure, projections of the interatomic function were drawn on the surfaces (010) and (100) as well as the projection of the electron density on these two surfaces (Figs 1,2,4,5). The structure of the ruthenium compound under investigation is compared in figure 3 with that of potassium chloroplatinate. Figure 6 shows the distribution of the atoms of hydroxo-nitroso-tetrammine ruthenium chloride within the elementary cell. The structure is based on the octahedral complex cation $[Ru(NO)(OH).(NH_3)_4]^{2+}$ and the chlorine anion. In the complex ion the Ru atom is placed in the center of the octahedron whose four corners lying in one plane are occupied by NH_3 groups, while the two other corners in trans-position are occupied by the groups NO and OH. This trans-position of the NO and OH group is characteristic of all complex compounds of Ru investigated so far, which has never been pointed out before. The interatomic distances in the complex ion are: Ru - N (from NH_3) = 2.23 Å,

The Structure of the Crystals of Hydroxo-nitroso-tetramine Ruthenium Chloride

Ru - N (from NO) = 2.07 Å, Ru - O (from OH) = 1.98 Å. Accordingly, the linkage of Ru to NO and OH is closer than that to NH_3. The atoms Ru, N and O do not lie in a straight, but form an angle: Ru - N - O ≈ 150°. The interatomic distances of neighboring complexes are in good agreement with the intermolecular distances calculated from the Van der Waals atomic radii. There are 6 figures, 3 tables, and 8 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov) Institut khimii Akademii nauk Uzbekskoy SSR (Chemical Institute of the Academy of Sciences of the Uzbek SSR)

SUBMITTED: July 20, 1958

24(2)

AUTHORS: Bokiy, G. B., Corresponding Member, AS USSR, Atovmyan, L. O., Khodasheva, T. S.

SOV/20-128-1-20/58

TITLE: On Some Special Crystallochemical Features of the Complex Compounds of Ruthenium and Osmium

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 1, pp 78-80 (USSR)

ABSTRACT: The afore-mentioned compounds have been only little investigated from the crystallochemical standpoint. These elements contain several stable groupings of the metal with light atoms, i.e. primarily with oxygen and nitrogen. The metal - hydrogen bond may differ according to the nature and number of the other atoms linked up to nitrogen: Me - NH_3, Me - NO_2, Me - NO, Me - N.

A similar series may be obtained for oxygen-containing compounds: Me - OH_2, Me - OH, Me - O. There is a certain similarity between these series, which the authors believe to be very important for the chemistry of these compounds. This fact has hitherto been to much neglected. The solid bond Ru - NO is a specific property of the complex compounds of ruthenium. The authors first point out some facts known from previous articles.

On Some Special Crystallochemical Features of the Complex Compounds of Ruthenium and Osmium

SOV/20-128-1-20/58

New data is then given on the structure of the complex compounds of ruthenium and osmium, which contain NO, N, H_2O, and Cl as components. The compounds $K_2[RuNOCl_5]$ and $K_2[RuCl_5H_2O]$ exhibit the same structure and belong to the deformed structure of the type K_2PtCl_6. The structure of $K_2[RuNOCl_5]$ was investigated more in detail. The bond Ru - N - O is linear, and the distances Ru - N and N - O amount to 1.70 Å and 1.25 Å . This is also confirmed by the following concept: $Me \equiv {}^{+}N - {}^{-}O$. Investigation of the Ru - NO bond is continued with the compound $K_2[RuNO(OH)(NO_2)_4]$ .. The osmium compounds $K_2Os_5NCl_5$ and $KOsNBr_4.2H_2O$ exhibit the same structure though their chemical formulas differ. These compounds are interesting because of the particular features of the sixth component, i.e. of nitrogen. In the structures of $K_2[OsNCl_5]$ and $K[OsNBr_4H_2O]H_2O$ the distance Os - N ... 1.60 is distinctly

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shorter than the sum of covalent radii (1.35 +0.55 = 1.90). The chlorine atom (which is in trans-position to the nitrogen atom) has a shortened distance on the coordinate N - Os - Cl (~2.1 Å). All this indicates the possible existence of a linear group which is similar to O - Os - O. The above series Me - N and Me - O are very similar in Ru- and Os compounds because the distances Me - N and Me - O are shortened in both cases. The authors then report briefly on the final members of the series of nitrogen-containing compounds. The assumption of linear groups in Os permits a new interpretation of the structure of the series of complex compounds. The authors believe that a compound of the composition $K_2OsO_4 \cdot 2H_2O$ contains the osmyl group $K_2[OsO_2(OH)_4]$. They began to analyze the structure of this group. Complex compounds similar to those investigated here are also found in Ru and some other metals. In many cases investigated in this article the one coordinate of the octahedral complex differs greatly from the two other coordinates. This assumption will be checked by several examples. There are 2 tables and 14 references, 5 of which are Soviet.

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On Some Special Crystallochemical Features of the Complex Compounds of Ruthenium and Osmium SOV/20-128-1-20/58

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences, USSR)

SUBMITTED: June 12, 1959

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A005/A001

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 21, p. 19, # 83741

AUTHORS: Bokiy, G. B., Khodashova, T. S.

TITLE: Crystallochemistry of Indium

PERIODICAL: Mineralog. sb. L'vovsk. geol. o-vo pri un-te, 1959, No. 13, pp. 53-64 (English summary)

TEXT: The authors review the crystallochemistry of the In-compounds. The peculiarities of the metallic In-structure, its intermetallic and inorganic compounds are shown, as well as some regularities of its geochemical behavior. The affinity of In is pointed out to form covalence bonds with low coordination numbers in intermetallic compounds. For inorganic compounds of In(3+) with oxygen and halogens the coordination number 6 (octahedron) is characteristic, with the elements of the Vb- and VIb-subgroups the coordination number 4 (tetrahedron). The affinity to the formation of tetrahedral covalence bonds with elements of the VIb-subgroup increases with the transition from above downwards within the subgroup. By analyzing the compound structures of In with formal valence (2+) it is

shown that actually either In-In bonds take place or simultaneously In (3+) and In^{+} are present. For In^{+} the coordination numbers 7 and 8 are characteristic. In geochemical respect, great similarity is observed between In and Zn (in sulfide minerals) as well as between In and Sn (in compounds containing oxygen). That is obviously dependent on the crystallochemical properties of In in the compound groups mentioned. The specific crystallochemical analogy between In and Hg is also pointed out.

T. Khodashova

Translator's note: This is the full translation of the original Russian abstract.

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PHASE I BOOK EXPLOITATION SOV/4253

Bokiy, Georgiy Borisovich

Kristallokhimiya (Crystallochemistry) 2d ed. [Moscow] Izd-vo Mosk. Univ., 1960. 356 p. Errata slip inserted. 8,000 copies printed.

Ed.: Ye. M. Romanova; Ed. of Publishing House: S.F. Kondrashkova; Tech. Ed.: M.S. Yermakov.

PURPOSE: This textbook is intended for students of higher educational institutions.

COVERAGE: This is the second edition of the text published under the title Vvedeniye v kristallokhimiyu (Introduction to Crystal Chemistry) by the Moscow State University in 1954. The present text consists of four parts and contains material on geometric crystallography, geometric theory of crystal structure, basic conceptions of crystal chemistry and crystal chemistry of the more important classes of compounds. The first and second parts were entirely rewritten, the third part is the same as in the first

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edition, and the fourth part contains partly new material. The author thanks Ye.M. Romanova for helping to prepare the manuscript for publication. There are 19 rererences: 12 Soviet, 4 English, and 3 German.

TABLE OF CONTENTS:

PORAY-KOSHITS, Mikhail Aleksandrovich; BOKIY, G.B., red.; KONDRASHKOVA, S.F., red.; YERMAKOV, M.S., tekhn.red.

[Practical course of X-ray diffraction study of crystal structures] Prakticheskii kurs rentgenostrukturnogo analiza. Moskva, Izd-vo Mosk.univ. Vol.2. 1960. 631 p. (MIRA 13:5)

1. Chlen-korrespondent AN SSSR (for Bokiy).
(X-RAY CRYSTALLOGRAPHY)

BOKIY, G. B., PORAY-KOSHITS, M. A.

[redacted]. "The Crystal Chemistry of Complex Compounds of Metals of Group VIII."

Acad. of Sciences, USSR.

paper submitted for 5th Gen. Assembly, Symposium on Lattice Defects, Intl. Union of Crystallography, Cambridge U.K. Aug 1960.

BOKIY, G.B.

Complex compounds having multiple bonds in the inner coordination sphere. Zhur. strukt. khim. 1 no.1:72-79 My-Je '60.
(MIRA 13:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Complex compounds)

KHODASHOVA, T.S.; BOKIY, G.B.

Structure of potassiym nitrosopentachlororuthenate. Zhur. struk. khim. 1 no.2:151-158 Jl-Ag '60. (MIRA 13:9)

1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova AN SSSR.
(Potassium compounds) (Ruthenium compounds)

ATOVMYAN, L.O.; BOKIY, G.B.

Structure of K_2OsNCl_5 and $K[OsNBr_4H_2O]$ H_2O. Zhur. strukt. khim. 1 no. 4:501-503 N-D '60. (MIRA 14:2)

1. Institut obshchey i neorganicheskoy khimii AN SSSR imeni N.S. Kurnakova i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Osmium compounds)

BOKIY, G.B.; PORAY-KOSHITS, M.A.

Crystallography of complex compounds of metals of group 8. Kristallografiia 5 no.4:605-619 Jl-Ag '60. (MIRA 13:9)

1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova.
(Complex compounds)

BOKIY, G.B.; KUKINA, G.A.

Structure of platinum cis-ethyleneammine dibromide crystals. Dokl. AN SSSR 135 no.4:840-842 '60. (MIRA 13:11)

1. Institut obshchey i neorganicheskoy khimii AN SSSR.
2. Chlen-korrespondent AN SSSR (for Bokiy).
(Platinum compounds)

BOKIY, G.B.; SMIRNOVA, N.L.

Crystallochemistry of arsenides, stibnides, and bismuthides.
Vest. mosk. un. Ser. 4: Geol. 15 no. 5:22-37 S-O '60.
(MIRA 13:12)

1. Kafedra kristallografii i kristallokhimii Moskovskogo universiteta.
(Arsenic compounds) (Stibnide compounds)
(Bismuth compounds)

SHAFRANOVSKIY, Ilarion Ilarionovich; BOKIY, G.B., red.; POPOV, G.M., red.; FEDOTOVA, A.I., red.izd-va; GUROVA, O.A., tekhn. red.

[Mineral crystals; curve-faced skeleton, and granular forms] Kristally mineralov; krivogrannye, skeletnye i zernistye formy. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geol.i okhrane nedr, 1961. 331 p. (MIRA 15:1)
(Crystallography)

BOKIY, G.B.; VUL'F, B.K.; SMIKHOVA, N.B.

Crystal structures of ternary metallic compounds. Zhur. strukt. khim. 2 no. 1:74-111 Ja F '61. (MIRA 14:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk, Voyenno-vozdushnaya inahenernaya akademiya im. N.Ye. Zhukovskogo i Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

(Metal crystals) (Alloys)

BOKIY, G.B.; ATOVMYAN, L.O.

Covalent atomic radii in multiple bonds. Zhur.strukt.khim. 2 no.3:308-311 My-Je '61. (MIRA 15:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk i Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova, AN SSSR.

(Chemical bonds)

BOKIY, G.B.; ROMANOVA, Ye.M.

Polyhedra in the structures of complex sulfoarsenides.
Kristallografiia 6 no.6:869-871 N-D '61. (MIRA 14:12)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Crystallography)
(Arsenic compounds)

S/078/61/006/008/002/018
B121/B203

AUTHORS: Bokiy, G. B., Tsurinov, G. G., Sokol, V. I., Kolodyazhnyy, V. Z.

TITLE: Immersion liquids for crystallo-optical studies at low temperatures (-100°C)

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 8, 1961, 1754-1758

TEXT: This study concerns the determination of optical constants of crystals in wide temperature ranges from +250 to -100°C using the immersion method by means of a thermostat installed in a ГС-10 (GS-10) goniometer. The method worked out permits a determination of refractive indices at temperatures to -150°C with an accuracy of 0.5°C. The temperature constance was controled with an ЭПВ-01 (EPV-01) or МРЩПр-54 (MRShchPr-54) electron potentiometer. Several immersion liquids with refractive indices of 1.378 - 1.705 were used for determining the refractive indices of crystals at a temperature below -100°C. The refractive index of crystals is calculated from the formula: $N = \frac{\sin(\frac{A+f}{2})}{\sin\frac{A}{2}}$, where N is the refractive

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index and A the prismatic angle. The dependence of refractive indices on the temperature of the respective liquids is expressed by a line whose angle of inclination depends on the refractive indices of the liquids. There are 2 figures, 1 table, and 12 references: 1 Soviet-bloc and 11 non-Soviet-bloc. The two most recent references to English-language publications read as follows: Ref. 7: R. Meysowitz, Amer. miner. 37, 853 (1952); Ref. 8: R. Meysowitz, Amer. min. 40, 398 (1955).

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: July 19, 1960

BOKIY, G.B.

Crystallochemical factors determining the behavior of water in frozen clay soils. Vest.Moks. un. Ser. 4: Geol. 16 no.1:15-21 Ja-F '61. (MIRA 14:3)

1. Kafedra kristallografii i kristallokhimii Moskovskogo universiteta.

(Frozen ground)
(Clay)

BOKIY, G.B.; ZAGAL'SKAYA, Yu.G.; POBEDIMSKAYA, Ye.A.

Crystallochemistry of sulfides. Report No.3: Sulfur, selenium, and tellurium of the AX_2 type. Vest.Mosk.un.Ser. 4: Geol. 16 no.3:18-33 My-Je '61. (MIRA 14:6)

1. Kafedra kristallografii i kristallokhimii Moskovskogo universiteta.
(Sulfur) (Selenium) (Tellurium)

GAYUI, Rene Zhyust [Hauy, Rene-Just]; SHAFRANOVSKIY, I.I., prof.; ZABOTKINA, O.S.[translator]; STRATANOVSKIY, G.A.[translator]; SHUBNIKOV, A.V., akademik, red.; BOKIY, G.B., red.; PETROVSKIY, I.G., akademik, red.; ANDREYEV, N.N., akademik, red.; KAZANSKIY, B.A., akademik, red.; YUDIN, P.F., akademik, red.; DELONE, B.N., red.; SAMARIN, A.M., red.; ZUBOV, V.P., prof., red; LEBEDEV, D.M., prof., red.; FIGUROVSKIY, N.A., prof., red.; KUZNETSOV, I.V., kand. filos. nauk, red.; OZNOBISHIN, D.V., kand. istor. nauk, red.; SUSHKOVA, T.I., red. izd-va; SMIRNOVA, A.V., tekhn. red.

[Structure of crystals; selected works] Struktura kristallov; izbrannye trudy. Sostavlenie, stat'ia i primechaniia I.I. Shafranovskogo. Redaktsiia A.V.Shubnikova i G.B.Bokiia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 175 p. Translated from the French. (MIRA 15:3)
1. Chlen-korrespondent Akademii nauk SSSR (for Bokiy, Delone, Samarin).

(Crystallography)

BOKIY, G.B.; ARKHIPENKO, D.K.

Oxonium ion in vermiculite. Zhur.strukt.khim. 3 no.6:697-702 '62. (MIRA 15:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR i Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Vermiculite—Spectra) (Oxonium compounds)

BATSANOV, S.S.; BOKIY, G.B.

Possibility of studying the hydrogen bond in hydroxides according to the interatomic distances. Zhur.strukt.khim. 3 no.6:716-718 '62. (MIRA 15:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

(Hydrogen bonding) (Hydroxides)

ATOVMYAN, L.O.; BOKIY, G.B.

Structure of the $NH_4Na[MoO_3C_2O_4] \cdot H_2O$ complex and its place in the classification of molybdenum compounds. Dokl. AN SSSR 143 no.2:342-344 Mr '62. (MIRA 15:3)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova AN SSSR. 2. Chlen-korrespondent AN SSSR (for Bokiy).
(Molybdenum compounds)

KRAVCHENKO, V.B.; BOKIY, G.B.

Crystalline structure of searlesite $NaBSi_2O_5(OH)_2$. Dokl. AN SSSR 143 no.3:690-692 Mr '62. (MIRA 15:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Bokiy).
(Searlesite)

BOKIY, Georgiy B.

"Crystal chemistry of complex compounds."

report to be submitted for the Sixth General Assembly and Intl. Congress of the Intl. Union of Crystallography (IUCr), Rome, Italy, 9-18 Sep 1963

Moscow State Univ, USSR

SHAFRANOVSKIY, Ilarion Ilarionovich; BOKIY, G.B., otv. red.;
SEMENOVA, Ye.A., red.izd-va; ZAMARAYEVA, R.A., tekhn. red.

Evgraf Stepanovich Fedorov. Moskva, Izd-vo Akad. nauk SSSR, 1963. 282 p. (MIRA 16:7)

1. Chlen-korrespondent AN SSSR (for Bokiy).
(Fedorov, Evgraf Stapanovich, 1853-1919)

KRAVCHENKO, V.B.; BOKIY, G.B.

Some physical properties of natural and artificial diamonds and their dependence on the atomic structure. Trudy IAFAN AN SSSR Ser. geol. no.9:178-186 '63. (MIRA 16:12)

BOKIY, G.B.; BATSANOV, S.S.

Structural aspect of transeffect. Zhur.strukt.khim. 4 no.1:80-84 Ja-F '63. (MIRA 16:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Complex compounds) (Refractometry)

ATOVMYAN, L.O.; BOKIY, G.B.

Structure of the crystals $NaNH_4[MoO_3C_2O_4] \cdot 2H_2O$. Zhur.strukt.khim. 4 no.4:576-583 Jl-Ag '63. (MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR, Moskva i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.
(Molybdenum compounds) (X-ray crystallography)

BOKIY, G.B.; SMIRNOVA, N.L.

Systematics of structural types. Part 1. Zhur.strukt.khim. 4 no.5:744-756 S-O '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

BOKIY, G.B.; BERSUKER, I.B.

Reason for the low trans-activity of the nitro group in octahedral complexes of tetravalent platinum. Zhur.strukt.khim. 4 no.6: 934-936 N-D '63. (MIRA 17:4)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR i Institut khimii AN Moldavskoy SSR.

BOKIY, G.B.

Development of N.S.Kurnakov's concepts in modern crystal chemistry ("Kurnakov lectures," Dec.6, 1962). Zhur.neorg.khim. 8 no.5:1033-1040 My '63. (MIRA 16:5)

(Crystallography)

BOKIY, G.B.; SOKOL, V.I.

Method of determination of the density of crystalline compounds stable at low temperature. Zhur.neorg.khim. 8 no.5:1041-1044 My '63. (MIRA 16:5)
(Crystals--Density) (Liquids--Density)

BOKIY, G.B.; KACHALOV, A.I.

Crystalline forms of astrakhanite. Vest.Mosk.un.Ser. 4:Geol. 18 no.2:58-60 Mr-Ap '63. (MIRA 16:5)

1. Kafedra kristallografii i kristallokhimii Moskovskogo universiteta.

(Bloedite)

BOKIY, Georgiy Borisovich; PORAY-KOSHITS, Mikhail Aleksandrovich; BELOV, N.V., akademik, red.; DOLIVO-DOBROVOL'SKAYA, Ye.M., red.

[X-ray structural analysis] Rentgenostrukturnyi analiz. Moskva, Izd-vo Mosk. univ. Vol.1. Izd.2. 1964. 488 p. (MIRA 17:12)

ACCESSION NR: AP4019270 S/0192/64/005/001/0064/0069

AUTHORS: Venglovski, S.; Bokiy, G.B.; Pobedimskaya, Ye. A.

TITLE: Crystal structure of titanium diarsenide $TiAs_2$

SOURCE: Zhurnal Strukturnoy khimii, v. 5, no. 1, 1964, 64-69

TOPIC TAGS: titanium diarsenide, crystal structure, x ray analysis, Paterson function, electronic density, titanium

ABSTRACT: X-ray analysis of $TiAs_2$ was conducted in order to determine its crystal structure. It crystallizes into a new structure type. The rhombic cell is a 13.27, b 8.96, c 3.50 A, N 8. All atoms hold the position 4 g of the spatial group $D_{2h}^{13} - Pnnm$. The schematic of atom grouping on the plane xy and the spatial drawing of $TiAs_2$ structure are given in Figure 2 and 3. Determination and specification of coordinates of atoms was made according to projections of the Paterson function and electronic density. Final distribution is given in enclosed figure 1. Orig. art. has: 3

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ACCESSION NR: AP4019270

figures, 1 table.

ASSOCIATION: Institut fizicheskoy khimii (Institute of Physical Chemistry); Polskoy Akademii nauk, Warsaw (Polish Academy of Sciences); Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University)

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