

Isomorphous Interactions Between Zirconium and
Titanium

SOV/20-125-4-56/74

The structure analysis confirmed on the whole the formula of this mineral (according to M. Ya. Kazakova and Ye. I. Semenov, Ref 2): $\text{Na}_8\text{Zr}_3\text{Ti}_3\text{Mn}_2[\text{SiO}_4]_8\text{F}_4$. The most essential change carried out by the authors was the affiliation of a third of Ti to Zr and the removal of each 8th O-atom from the silicon-oxygen radical (which is less visible for the analyst). The two interpretations by Ye. I. Semenov (Ref 2) are from the first dangerous in view of the numbers obtained by a detailed analysis (M. Ye. Kazakova). Ye. I. Semenov is, however, right in the case of Seydoserite in its cation distribution as was confirmed by the X-ray structure analysis of the authors. Only two maxima were determined on the corresponding projection. One of them may be ascribed to the Mn-cation, the other one to the Ti. After the identification of the higher maximum with Mn the authors immediately discovered a mistake in the case of the distances between these two cations and the surrounding O-atoms. This mistake could be corrected only by the exchange of Ti and Mn. It could, however, not be concluded from the height of the Ti-maxima that Zr is contained in them. On the

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contrary, the chemical and radiographic analysis pointed out clearly that a fourth of Zr is replaced by Ti. Thus the assumed isomorphism would be in any case unilateral. After the detection that 1/4 of the Zr-atoms is replaced by Ti in Seydosarite, and correspondingly the half of the Mg-atoms by Mn, not only one, but 2 paradoxes are solved. The Mn which inclines towards high oxidation degrees is transformed from the bivalent state into a trivalent (or ? even tetravalent) one. Correspondingly the tetravalent Ti becomes trivalent (like in the case of pyroxene, Ref 4). The reaction $Ti^{4+} + Mn^{2+} \rightleftharpoons Ti^{3+} + Mn^{3+} (Mn^{4+} ?)$ renders the radius of the Ti^{3+} ($R_1 = 0.83 \text{ \AA}$) immediately comparable to that of Zr^{4+} (0.87 \AA) and to that of Mn^{3+} (0.71 \AA) with that of Mg^{2+} (0.78 \AA). It is not necessary that the reaction is finished, a corresponding tendency is sufficient. These statements are illustrated by other minerals. There are 4

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Soviet references.

ASSOCIATION: Institut kristallografii Akademii nauk SSSR (Institute of
Crystallography of the Academy of Sciences, USSR)

SUBMITTED: January 21, 1959

Card 4/4

3 (8)

AUTHORS:

Mamedov, Kh. S., Klevtsova, R. F.,
Belov, N. V., Academician

SOV/20-126-1-41/62

TITLE:

On the Crystalline Structure of the Tricalcium Silicate Hydrate
TSH = $6\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O} = \text{Ca}_6[\text{Si}_2\text{O}_7](\text{OH})_6 = \text{Ca}_4[\text{Si}_2\text{O}_7](\text{OH})_2 \cdot 2\text{Ca}(\text{OH})_2$ (O kristallicheskoj strukture gidrata trekhkal'tsiyevogo silikata TSH = $6\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O} = \text{Ca}_6[\text{Si}_2\text{O}_7](\text{OH})_6 = \text{Ca}_4[\text{Si}_2\text{O}_7](\text{OH})_2 \cdot 2\text{Ca}(\text{OH})_2$)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1, pp 151-154 (USSR)

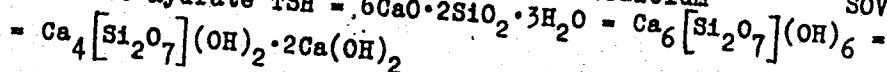
ABSTRACT:

The investigation of the cuspidine structure (Ref 1) became an important step towards further investigations of several Ca-silicates, above all of wollastonite and xonotlite (Ref 3). The main peculiarity of cuspidine and of the investigated structure of tilleyite (Fig 1) was, compared to the Mg(Fe)- and Al-silicates, the rôle which the $[\text{SiO}_4]$ -tetrahedrons play in the latter and which is played by the diorthotic groups $[\text{Si}_2\text{O}_7]$ in the Ca-silicates with respect to geometrical reasons.

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On the Crystalline Structure of the Tricalcium
Silicate Hydrate TSH = $6\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O}$

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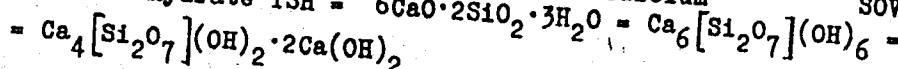


The variety of the motives to which this group belongs in the Ca-silicates is considerably limited by a certain inertia of the diorthotic groups and the existence of only one direction with a dimension of 3.7 Å (height of the group) (Figs 1:1 cursive). Thus a "tilleite band" occurs in both initially mentioned Ca-silicates as a mineralogical radical (Figs 1. 1). Figure 1 shows that a part of the tilleite band consists of 8 octahedra and two $[\text{Si}_2\text{O}_7]$ groups. The 14 O-atoms of the two last groups are, however, not sufficient to counterbalance the cation charges. This is compensated (according to Ref 5) by additional anions F, OH in the cuspidine structure. The latter consists completely of tilleite bands of a most simple formula: $\text{Ca}_8[\text{Si}_2\text{O}_7]_2(\text{F}, \text{OH})_4 = 2\text{Ca}_4[\text{Si}_2\text{O}_7](\text{F}, \text{OH})_2$. The second variant of the two most simple geometrical solutions for such a formula is realized in nature. In this case the members of Ca-octahedra of a tilleite band continue one another in forming somewhat longer 4-membered members.

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On the Crystalline Structure of the Tricalcium
Silicate Hydrate TSH = $6\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O}$

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It seems that the latter strengthen the structure since they lie one behind the other. In the structure of tillite itself the tillite bands are not fused, they are related to one another by additional CO_3 -groups. This demands the introduction of an additional Ca-octahedron as well, so that the formula will be $\text{Ca}_4[\text{Si}_2\text{O}_7]\text{CO}_3 \cdot \text{CaCO}_3$ (Fig 2). In 1958 (Ref 6) new data on the hydrothermal synthesis of the substance mentioned in the title (TSH) were published and a formula suggested. If the formula of the tillite band is reduced from the formula of TSH 2 portlandite molecules $\text{Ca}(\text{OH})_2$ are obtained. It is assumed that these were replaced in the formula to the "side chain" outside the cuspidine nucleus (Table 1). They form a third layer with their 4 OH particles which links the tillite bands (with 2 layers). The additional Ca-octahedra (Fig 3) which replace the CO_3 groups in tillite are placed here as well. The authors draw the conclusion that

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On the Crystalline Structure of the Tricalcium
Silicate Hydrate TSH = $6\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O} = \text{Ca}_6[\text{Si}_2\text{O}_7](\text{OH})_6$ - SOV/20-126-1-41/62
= $\text{Ca}_4[\text{Si}_2\text{O}_7](\text{OH})_2 \cdot 2\text{Ca}(\text{OH})_2$

the TSH structure is pseudohexagonal, similarly to anhydrous tricalcium silicate. The authors of reference 5 are therefore rather wrong when they insist on a true hexagonality of TSH. This is confirmed as well by the thermogram. There are 3 figures, 1 table, and 6 references, 4 of which are Soviet.

ASSOCIATION:

Institut khimii Akademii nauk AzerbSSR (Institute of Chemistry of the Academy of Sciences, Azerbaydzhan SSR)
Institut kristallografii Akademii nauk SSSR (Institute of Crystallography of the Academy of Sciences, USSR)

SUBMITTED:

February 26, 1959

Card 4/4

3 (8)

AUTHORS:

Mamedov, Kh. S., Simonov, V. I.,
Belov, N. V., Academician

SOV/20-126-2-42/64

TITLE:

On Wöhlerite-Lovenite and Rinkite Mosandrite Groups
(O gruppakh velerita-lovenita i rinkita-mozandrita)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 2,
pp 379-381 (USSR)

ABSTRACT:

The 2 groups named in the title followed each other in modern text-books (Refs 1, 2) and in mineralogical tables (Ref 3). Despite a somewhat closely-connected type-formula, they differ greatly with respect to their shape and the parameters of the elementary cells. The recently published results of an exhaustive investigation of the Zr,Ti-silicate of Lovozero - the Seydhozerite (Refs 4, 5) change the mineralogical picture considerably. This mineral was placed by its discoverer (Ref 6) into the Wöhlerite-Lovenite group (ZrO_2 -content = 23 %). According to röntgenometrical data it doubtlessly belongs to the Rinkite group. Moreover, this mineral should because of its ideal structure be placed on top of the Seydhozerite-Rinkite-group. The same test of the

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On Wöhlerite-Lovenite and Rinkite Mosandrite Groups SOV/20-126-2-42/64

structure (Figs 4, 5) proved that cuspidine should be placed on top of the Wöhlerite-Lovenite-group. In the essential work on the cuspidine and other purely mineralogical publications much space was devoted to its close structural connection with another Ca-silicate, the tillite. By means of geometrical analysis of this simplest Ca-silicate there was determined an infinite mineralogical radical - the tillite band which all minerals have in common (Fig 1). With the aid of this band such an important compound as tricalciumsilicate-hydrate (Ref 8) is for cement-chemistry, could simply be "put together" and a structural solution could be found. A second interesting result obtained in consequence of the tillite band determination is the aforementioned geometrical (structural) difference between both mineral groups, mentioned in the title. Hence further (rational) combination of both these groups, which are already connected by a common type-formula is necessary. From figures 2-4, one may see that the minerals of the Cuspidine-Wöhlerite-Lovenite group are (at least from the geometrical standpoint) only a polymorphous modification of the mineral group Seydhozerite-Rinkite. Perhaps in this case the term polytypical modification would

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On Wöhlerite-Lovenite and Rinkite Mosandrite Groups

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be more convenient. This modification is characteristically expressed by the projection-surface of the cell which is nearly the same if slight differences in the length of the axis are not taken into account. In real minerals (Table 1) above all the composition changes. There are 4 figures, 1 table, and 8 references, 7 of which are Soviet and 1 German.

ASSOCIATION: Institut khimii Akademii nauk AzerbSSR (Institute for Chemistry of the Academy of Sciences of the Azerbaijan SSR)
Institut kristallografii Akademii nauk SSSR (Institute for Crystallography of the Academy of Sciences, USSR)

SUBMITTED: February 26, 1959

Card 3/3

~~24 (3), 24 (2)~~ 24.7000

66455

AUTHORS: Neronova, N. H., Belov, N. V.,
Academician

SOV/20-129-3-23/70

TITLE: The Symmetry of Ferroelectrics

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 556-557 (USSR)

ABSTRACT: B. A. Tavger (Ref 1) showed a short time ago that the point-symmetry (macrosymmetry) of ferromagnetics is described by the 31st group of the total number of 90 Kheyesh-Shubnikov groups (plus-minus groups, black-and-white groups). The main vector is known to be the most characteristic element of ferroelectrics as well as of ferromagnetics, but in ferromagnetics it is a polar vector, and in the case of ferroelectrics it is an ordinary axial vector. The maximum symmetry of the axial vector is $\frac{\infty}{m} \frac{2'}{m'} \frac{2'}{m'}$, and that of the polar vector is $\frac{\infty}{m'} \frac{2'}{m} \frac{2'}{m}$. These symbols are of the "international" type. The 31st crystallographical group is a subgroup of the two groups of maximum symmetry, and it supplies the required groups. A table contains the ferromagnetic and ferroelectric symmetry groups for the various crystal systems given in

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The Symmetry of Ferroelectrics

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international denotations. In all cases (except in the monoclinar groups) the z-axis was chosen as the direction of the main vector. An interesting survey of all spatial ferromagnetic and ferroelectric groups will be published in the next issue of the periodical "Kristallografiya". There are 1 table and 4 Soviet references.

SUBMITTED:

August 21, 1959

4

Card 2/2

BELOV, N. V. (Moscow)

Neue Blätter aus dem 2 Kapitel der Kristallchemie der Silikate

report submitted for the Symposium on Silicates with 1 & 2 cations,
Berlin, DDR, 7-9 Apr 60

CHUKHROV, F.V., glavnyy red.; BONSHTEDT-KUPILETSKAYA, E.M., doktor
geol.-mineral.nauk, zam.glavnogo red.; BARSANOV, G.P., prof.,
red.; BELOY, N.V., akademik, red.; SHUBENIKOVA, O.M., doktor
geol.-mineral.nauk, red. [deceased]; SHADLON, T.N., red.izd-va;
ZHELENKOVA, Ye.V., tekhn.red.

[Minerals; a handbook] Mineraly; spravochnik. Moskva. Vol.1.
[Native elements. Intermetallic compounds. Carbides, nitrides,
phosphides, arsenides, antimonides, bismuthides, sulfides,
selenides, tellurides] Samorodnye elementy. Intermetallicheskie
soedineniya. Karbidy, nitridy, fosfidy, arsenidy, antimonidy,
vismutidy, sul'fidy, selenidy, telluridy. 1960. 616 p.

(MIRA 13:12)

1. Akademiya nauk SSSR. Institut geologii rudnykh mestorozhdeniy,
petrografii, mineralogii i geokhimii. 2. Chlen-korrespondent
AN SSSR (for Chukhrov).

(Mineralogy--Handbooks, manuals, etc.)

FERSMAN, Aleksandr Yevgen'yevich, akademik; SERDYUCHENKO, D.P., doktor
geol.-mineral.nauk, otv.red.; BELOV, N.V., akademik, red.;
VINOGRADOV, A.P., akademik, red.; SECHERBAKOV, D.I., akademik,
red.; SAUKOV, A.A., red.; SECHERBINA, V.V., doktor geol.-mineral.
nauk, red.; KUN, I.R., red.isd-va; ASTROV, A.V., red.isd-va;
KASHINA, P.S., tekhn.red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad.nauk SSSR.
Vol.6. 1960. 742 p. (MIRA 13:11)

1. Chlen-korrespondent AN SSSR (for Saukov).
(Pegmatites) (Granite)

BELOV, N.V.

Studies in structural mineralogy. Part II. Min.sbor.
no.14:3-33 '60.

(MIRA 15:2)

1. Moskva, Institut kristallografii AN SSSR.
(Mineralogy)

BELOV, N.V.

Second chapter in the crystallochemistry of silicates. Zhur. strukt.
khim. 1 no.1:39-50 Ny-Je '60. (MIRA 138)

1. Institut kristallografii AN SSSR.
(Silicates)

POBEDIMSKAYA, Ye.A.; BELOV, N.V.

Structure of epididymite, $\text{NaBeSi}_3\text{O}_7(\text{OH})$. New form of unbounded silicon-oxygen chains (strings), $[\text{Si}_6\text{O}_{15}]$. Zhur. strukt. khim. 1 no.1:51-63 My-Je '60. (MIRA 13:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Epididymite)

24.7100

78093

SOV/70-5-1-2/30

AUTHOR:

Belov, N. V.

TITLE:

The Problems of Crystal Chemistry of Silicates

PERIODICAL:

Kristallografiya, 1960, Vol 5, Nr 1, pp 15-18 (USSR)

ABSTRACT:

The 7-year plan of the X-ray Laboratory at the Crystallographical Institute (Rentgenostrukturnaya Laboratoriya Instituta Kristallografii) includes the further development of crystal chemistry of silicates as an urgent problem because of its importance for the industries producing refractory alloys, ceramics, glass, cement, etc. Crystal chemistry, particularly that of silicates, was initiated in the USSR in 1935 with the organization of the X-ray Laboratory at the Crystallographical Institute in Moscow; but after a brief period of studies and experiments, interest to the subject cooled-off. Then, in 1953 when new ideas on the structure of silicates became urgently needed to explain some structures inconsistent with the Bragg

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theory, to produce and develop new silicates and refractory alloys for industry, the Crystallographical Institute became very active, and new research centers such as those in Gor'kiy and Baku were organized. A new idea emerged that, contrary to the Bragg theory, the structure of silicates is not determined by the combination of SiO_4 tetrahedra, but by the combination of octahedrally coordinated cations, while chemically inert silicic radicals just adopt the spaces left between, and tetrahedra or their combinations deform themselves to fit into the spaces between well arranged cations. If the latter are small (Mg, Fe, Al), octahedra edges are of about the same length as the edges of SiO_4 tetrahedra. Larger cations (Zr, Ti, Nb, Ta, Mn), on the other hand, form octahedra whose edges are too long for SiO_4 and, consequently, Si_2O_7 fills in the remaining spaces forming double rings, double chains, etc. Thus, atomic radii of cations determine two principally different types of structures, of which

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The Problems of Crystal Chemistry of Silicates

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those formed by small cations are subject to Bragg's theory, while the others, with Si_2O_7 combinations, give rise to a new chapter in the crystal chemistry of silicates. There are also combinations of the two principal types. Since refractory and other properties of silicates are direct functions of their structure, new concepts on crystal structure are important and will be developed still further.

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24.7100

78110

SOV/70-5-1-19/30

AUTHORS:

Belov, N. V., Tarkhova, T. N.

TITLE:

Cayley Squares for Cubic Point Groups. Brief Communications

PERIODICAL:

Kristallografiya, 1960, Vol 5, Nr 1, pp 129-134 (USSR)

ABSTRACT:

The Cayley squares for point groups 432 and $m\bar{3}$ of cubic system are compiled in a four-page table to assist theoreticians in crystallography; also simplified designations for symmetry operations used in the table are explained. A reference is made to a letter by E. Tavora (Brazil) stating that he was the first who emphasized great significance of Cayley squares in crystallography. The figures for point group $\bar{4}3m$ can easily be obtained from the table for 432 by substituting $\bar{4}$ and m for 4 and 2 , respectively. Similarly, point groups $m\bar{3}$ and 23 differ only because of the occurrence of two-fold rotor in the latter instead of the rotary inverter

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Cayley Squares for Cubic Point
Groups. Brief Communications

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of the former; consequently, the Cayley squares for the
the latter can be derived from those of the former
by substituting 2 for m ($\bar{2}$). The relationship
between the groups concerned is illustrated in Fig. 1.
In any event, a rotary inverter and rotor occupy
identical positions. Cubic crystals can have
neither six-fold rotor nor rotary inverter. There
is 1 figure; and 1 table.

ASSOCIATION:

Gor'kiy State University imeni N. I. Lobachevskiy
(Gor'kovskiy gosudarstvennyy universitet imeni
N. I. Lobachevskogo)

SUBMITTED:

September 11, 1959

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Cayley Squares for Cubic Point
Groups. Brief Communications

78110
SOV/70-5-1-19/30

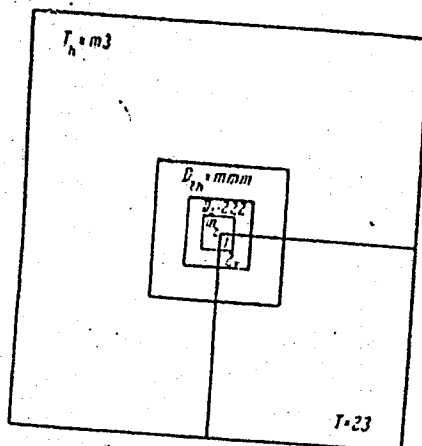


Fig. 1.

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PLYUKHIN, V.V.; BELOV, N.V.

Determination of the structure of lovoserite from the cross sections
of the three-dimensional Paterson function. Kristallografiia 5 no.2:
200-214 Mr-Apr '60. (MIRA 13:9)

1. Institut kristallografii AN SSSR.
(Lovoserite)

RUMANOVA, I.M.; BELOV, N.V.

False symmetry in the structure of lawsonite. Kristallografiia 5
no.2:215-217 Mr-Apr '60. (MIRA 13:9)

1. Institut kristallografi AN SSSR.
(Lawsonite)

S/070/60/005/003/022/024/XX
E132/E460

AUTHOR: Belov, N.V.

TITLE: The Crystal Structure of Baddeleyite (Monoclinic ²¹ZrO₂)

PERIODICAL: Kristallografiya, 1960, Vol.5, No.3, pp.460-461

TEXT: The high temperature modification of ZrO₂ is cubic and has the CaF₂ structure with a Zr coordination number of 8. The coordination polyhedron is a cube. At room temperature this structure is unstable and goes over to a monoclinic form with dimensions very similar to those of the cubic form but with $\beta = 100^\circ$. The structure of this form was originally proposed by K.Lonsdale but has now been worked out in detail by McCullough and Trueblood (Acta Cryst. 12, 507, 1959). It is shown that the coordination number of the Zr is lowered to 7 and the way in which this happens is particularly neat. The structure of baddeleyite can be considered as consisting of distorted square nets of oxygen ions alternating with oxygen nets made up of squares and triangles. The Zr ion touches 4 ions of the all square sheet and either 3 ions or 4 ions of the mixed sheet according to the way it is displaced in its own plane. The particular placing of the sheet thus gives either the 8-coordination of the high temperature form or the Card 1/-

S/070/60/005/003/022/024/XX
E132/E460

The Crystal Structure of Baddeleyite (Monoclinic ZrO_2)
7-coordination of the baddeleyite. The two possible directions in which the displacement can take place explain the almost inevitable twinning observed in baddeleyite. Pauling's rules are satisfied. There are 3 figures and 8 references: 5 Soviet, 2 English and 1 German. ✓

ASSOCIATION: Institute of Crystallography AS USSR
(Institute of Crystallography AS USSR)

SUBMITTED: March 5, 1960

Card 2/2

S/070/60/005/004/002/012
E132/E360

AUTHORS: Indenbom, V.L., Belov, N.V. and Neronova, N.N.

TITLE: The Point Groups of Colour Symmetry (Coloured
Classes)

PERIODICAL: Kristallografiya, 1960, Vol. 5, No. 4,
pp 497 - 500 + 1 plate

TEXT: The concept of colour symmetry is applicable not only to plane and space groups but also to the point groups. For two colours there will be 58 (magnetic) classes. The coloured point groups have been derived before (O. Wittke and J. Garrido, Bull. Soc. franc. miner.cristall., 223-30, 1959) but in this case are lost among the 211 ways of colouring polyhedra which the authors described. All the 18 multicoloured classes are listed and illustrated by coloured figures. The ordinary 32 point groups have, in all, 18 pairs of complex conjugate one-dimensional representations. These are listed and each is shown to correspond to a colour group. In the notation primes indicate the coloured element. The parent group is given first:

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E132/E360

The Point Groups of Colour Symmetry (Coloured Classes)

4-colour groups - C_4 gives $4'$; S_4 , $4'$; C_{4h} , $4'/m$ and $4'/m'$;

3-colour groups - C_3 gives $3'$; C_6 , $3'.2$; S_6 , $3'.i$ and $3'.i'$;

C_{6h} gives $3'.2/m$ and $3'.2/m'$; T , $2.3'$; T_h , $m3'$;
 C_{3h} , $3'/m$ and $3'/m'$;

6-colour groups - C_6 gives $3'.2'$; C_{6h} , $3'.2'/m$;
 $3'.2'/m'$; T_h , $m'3'$.

There are 7 tables and 6 references: 5 Soviet and 1 French.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography of the AS SSSR)

SUBMITTED: February 3, 1960

Card 2/2

KLEVTSOVA, R.F.; ~~BELOV~~ N.Y.

Crystal structure of spurrite. Kristallografiia 5 no.5:689-
697 S-O '60. (MIRA 13:10)

1. Institut kristallografii AN SSSR i Institut neorganicheskoy
khimii Sibirskogo otdeleniya AN SSSR.
(Spurrite)

BELOV, N.V., akademik

Berlin symposium on silicates with monovalent and divalent cations.
Zhur. VKHO 5 no.6:686-688 '60. (MIRA 13:12)
(Silicates)

BAKAKIN, V.V.; BELOV, N.V.

Crystal structure of paracelsian. Kristallografiia 5 no.6:854-
868 N-D '60. (MIRA 13:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR.

(Celsian)

BELOV, N.Y.; TAMBELLINI, V.P.

Opening-up of dense layers of low permeability by means of powerful blasting charges. Gaz.prom. 5 no.9:6-12 S '60.

(Oil wells)

(Blasting) (MIRA 13:9)

BELOV, N.V.

Crystallochemical principles underlying the discussion of the iso-
morphous state of boron in silicates. Geokhimiia no.6:551-556 '60.
(Boron) (Silicates) (Isomorphism) (MIRA 13:10)

BELOV, N.V.; PRIKHOD'KO, N. Ye.; SIMONOV, V.I.; FLORINSKAYA, V.A.;
MCHEDLOV-PETROSYAN, O.P.

Symposium on the study of silicates of monovalent and divalent cations. Zhur. prikl. khim. 33 no.11:2598-2600 N '60.
(MIRA 14:4)
(Silicates—Congresses)

SERDYUCHENKO, D.P.; BELOV, N.V.

Concerning the so-called "sulunite." Zap. Vses. min. ob-va 89 no.3:
367-368 '60.

(Chlorites)

(MIRA 13:8)

80086

S/020/60/131/06/27/071

B014/B007

5.2620

AUTHORS: Malinovskiy, T. I., Samus', I. D., Belov, N. V., Academician

TITLE: The Crystalline Structure of the Cobalt Rhodanopentammine Nitrate
 $[\text{Co}(\text{NH}_3)_5\text{NCS}](\text{NO}_3)_2$

PERIODICAL: Doklady Akademii nauk SSSR; 1960, Vol. 131, No. 6, pp. 1327 - 1329

TEXT: The crystals investigated were bred by the method developed by A. Werner and H. Mueller (Ref. 1). Laue diffraction patterns were made. The crystals were found to belong to the cubic class; the length of the elementary cube is given as $10.73 \pm 0.02 \text{ \AA}$. The pycnometrically determined density is 1.766. It is found that the Co atom is in the center of the cubic nucleus, that the Co- and S atoms are distributed in the rock salt like the Na- and Cl atoms, and that the NH_3 groups are octahedrally distributed round four Co atoms. The further structure of the lattice is described in detail, the Patterson projection (Fig. 1) being used for the clarification of the position of individual atoms and atomic groups. There are 1 figure and 5 references, 4 of which are Soviet.

ASSOCIATION: Moldavskiy filial Akademii nauk SSSR (Moldavian Branch of the

Card 1/2

The Crystalline Structure of the Cobalt Rhodanopentammine Nitrate $[\text{Co}(\text{NH}_3)_5\text{NCS}](\text{NO}_3)_2$

80086

S/020/60/131/06/27/071
B014/B007

Academy of Sciences, USSR). Institut kristallografii Akademii nauk
SSSR (Institute of Crystallography of the Academy of Sciences, USSR)

SUBMITTED: January 26, 1960

Card 2/2

S/020/60/135/003/021/039
B019/B077

AUTHORS: Bakakin, V. V., and Belov, N. V., Academician

TITLE: The Crystal Structure of Hurlbutite

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 3, pp. 587-590

TEXT: In earlier papers, the authors presented the results of X-ray diffraction studies with $\text{CaBe}_2\text{P}_2\text{O}_8$ and compared them with data of $\text{CaB}_2\text{Si}_2\text{O}_8$. Since they lacked exact data of the x-coordinate, it was not possible to determine the structure of hurlbutite, which is the task of this paper. In Table 1 39 coordinates of the 13 basic atoms of the hurlbutite are given. The spacings of the P and O atoms are between 1.55 and 1.60 Å, those of the Be and O atoms between 1.57 and 1.61 Å, and the O-O summits of the PO_4 and BeO_4 tetrahedrons are between 2.50 and 2.66 Å or between 2.51 and 2.72 Å. The seven Ca-O spacings are between 2.42 and 2.52 Å. It can be seen that the dimensions for the PO_4 and the BeO_4 tetrahedrons are very similar and are found between the dimensions of the SiO_4 and BO_4 .

Card 1/2

The Crystal Structure of Hurlbutite

S/020/60/135/003/021/039
B019/B077

tetrahedrons. The similarity between hurlbutite and the feldspars is mentioned especially that of $\text{CaAl}_2\text{Si}_2\text{O}_8$ and it is found that the structure of hurlbutite is a key to decode the structure of the paracelsian ($\delta\text{-BaAl}_2\text{Si}_2\text{O}_8$). There are only preliminary data given for the paracelsian, a detailed research is announced. There are 3 figures, 2 tables, and 3 Soviet references.

SUBMITTED: August 15, 1960

	x	y	z		x	y	z
Ca	0,388	0,085	0,753	O ₈	0,121	0,367	0,438
Be ₁	0,059	0,196	0,435	O ₁	0,126	0,364	0,055
Be ₂	0,285	0,421	0,933	O ₂	0,412	0,308	0,565
P ₁	0,264	0,418	0,560	O ₃	0,415	0,309	0,931
P ₂	0,050	0,197	0,060	O ₇	0,006	0,150	0,247
O ₁	0,188	0,083	0,508	O ₂	0,184	0,421	0,745
O ₇	0,189	0,085	0,993				

Card 2/2

BELOV, Nikolay Vasil'yevich; DRAGUNOV, E.S., red. izd-va; POLYAKOVA, T.V.,
tekhn. red.

[Crystal chemistry of silicates with large cations] Kristallo-
khimiia silikatov s krupnymi kationami. Moskva, Izd-vo Akad.
nauk SSSR, 1961. 66 p. (Chteniia im. V.I.Vernadskogo, no.2)

(MIRA 15:1)

(Silicates) (Crystallography)

ZHDANOV, German Stepanovich; BELOV, N.V., akad., retsenzents; ARKHAROV, V.I.,
prof., retsenzents; BELOV, K.F., prof., retsenzents; ZAKHAROVA, M.I.,
prof., retsenzents; GOL'DENBERG, G.S., red.; GEORGIYEVA, G.I., tekhn.
red.

[Solid-state physics] Fizika tverdogo tela. Moskva, Izd-vo Mosk.
univ., 1961. 500 p. (MIRA 14:6)
(Solids)

13 EL00, N.V.

ALIKHAYEV, R. A., Institute for Physical Problems, Academy of Sciences USSR, Moscow - "Neutronographic study of NiCO₃" (Section J-2)

BELOW, M. V., Associate Director, Institute of Crystallography, Academy of Sciences USSR, Moscow - "Magnetic (ferromagnetic) space group symmetry" (C-6)

BELOW, M. V., KHEIDOVA, E. M., Both Institute of Crystallography, Academy of Sciences USSR, Moscow, DOBMAN, J. D. E., Johns Hopkins University, Baltimore, Md., and DORRAN, G. M., Geophysical Laboratory, Carnegie Institution, Washington, D. C. - "Tables of magnetic space groups, II. Special positions" (C-6)

BYROV, S. A., Institute for Physical Problems, Academy of Sciences USSR, Moscow - "Antiferromagnetic resonance in carbonates of transition elements" (sic) (M-16)

KROVITZ-KRAVITZ, A. S., ALKHAJEV, S. G., and KUDASHOV, O. V. - "Paramagnetic effect in antiferromagnets" (M-16)

KUDASHOV, O. V., Head, Magnetism Laboratory, Moscow State University - (1) "Thin films of very low magnetic anisotropy" (M-16); (2) "On the connection between the spontaneous magnetization of current carrying and the ferromagnetic effect in ferromagnetic thin films" (M-16); (3) "On the connection between the spontaneous magnetization and magnetic anisotropy in thin films" (M-16)

LOBACHEV, B. and VAKHREYEV, B. - "Institute of Crystallography, Moscow - "Neutron diffraction study of thionine CO (M-16)"

LYAZHENKO, B. G., Central Scientific Research Institute of Metallurgy, Moscow - "The problem of the influence of spontaneous magnetization on crystal structure and phase state of alloys" (M-8)

LYAZHENKO, B. G., LITVIN, D. P., YUKEL, I. M., AND, I. G. - "Central Scientific Research Institute of Metallurgy, Moscow - "Neutron diffraction investigation of order-disorder in the alloys 'Ferrous-nickel and ferrous-cobalt' (J-1)

LYAZHENKO, B. G., LYAZHENKO, V. S., ZEMALY, G. S., and LYAZHENKO, V. S., Scientific Research Institute of Crystallography, Moscow - "Neutron diffraction study of the structure of solid hydrogen and deuterium" (C-8)

LYAZHENKO, V. S., Institute of Crystallography, Academy of Sciences USSR, Moscow - "Results and progress of electron diffraction analysis" (C-11)

LYAZHENKO, V. S., Scientific Research Institute of Metallurgy, Moscow - "Magnetic scattering in alloys of Ni-Fe-Co alloys" (M-5)

LYAZHENKO, V. S., Scientific Research Institute of Metallurgy, Moscow - "Some problems of the neutron diffraction study of the structure of the high coercive materials" (M-17)

LYAZHENKO, V. S., Institute of Crystallography, Moscow - "Investigation of the structure of ferro and antiferromagnets" (M-11)

LYAZHENKO, V. S., Institute of Crystallography, Academy of Sciences USSR - "Development of electron diffraction method" (C-11)

LYAZHENKO, V. S., KHEIDOVA, E. M., KHEIDOVA, E. M., and KHEIDOVA, E. M., Institute of Crystallography, Moscow - "Atomic and magnetic structures of magnetic ferrite" (J-2)

LYAZHENKO, V. S., Institute of the Physics of Metals, Academy of Sciences USSR, Sverdlovsk. A member of the IUPAP Commission on Magnetism. See paragraph 1 of Comment for a complete listing of members of the Commission. "Some investigations of Soviet physics on the theory of ferromagnetism for the last years" (Invited paper. Section M-11)

paper to be submitted for the IUPAP Intl. Conference on Magnetism and Crystallography, Kyoto, Japan, 25-30 Sep 1961

BELOV, N.V.

Studies in structural mineralogy. Report No.12: Min. sbor.
no.15:5-44 '61. (MIRA 15:6)

1. Institut kristallografii AN SSSR, Moskva.
(Mineralogy)

KLEBER, V.; BELOV, N.V.

Morphological aspect of hopenite. Kristallografiia 6 no.6:825-
827 N-D '61. (MIRA 14:12)

1. Mineralogo-petrograficheskiy institut i Muzey Gumbol'dtovskogo
universiteta, Berlin i Institut kristallografii AN SSSR, Moskva.
(Minerals)
(Crystallography)

PLYUKHIN, V.V.; BELOV, N.V.

Crystalline structure of rubidium di(meta)fluoberyllate
 RbBe_2F_5 and its model relations to laminated silicates
with $[\text{Si}_2\text{O}_5]$ radical. Kristallografiia 6 no.6:847-858 N-D
161. (MIRA 14:12)

1. Institut kristallografi AN SSSR.
(Rubidium beryllium fluoride)
(Silicon oxides)
(Crystallography)

VOLODINA, G.F.; RUMANOVA, I.M.; BELOV, N.V.

Crystalline structure of praseodymium nitrate hexahydrate
 $\text{Pr}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$. Kristallografiia 6 no.6:919-922 N-D '61.
(MIRA 14:12)

1. Institut kristallografii AN SSSR.
(Praseodymium nitrate)
(Crystallography)

BELOV, N.V., akademik; VAYNSHTEYN, B.K., doktor fiz.-matem.nauk

Tendencies in the development of modern crystallography;
results of the Fifth International Congress on Crystal-
lography. Vest. AN SSSR 31 no.4:99-104 Ap '61.

(MIRA 14:4)

(Crystallography—Congresses)

BELOV, N.V.

Position of quartz in the system of natural and synthetic
silicates. Zap. Vses. min.ob-va 90 no.2:168-171 '61. (MIRA 14:9)
(Quartz) (Silicates)

BELOV, N.V.

Friedel's theorem. Zap.Vses.min.ob-va 90 no.3:257-259 '61.

(MIRA 14:10)

(Crystal lattices)

POBEDIMSKAYA, Ye. A.; BELOV, N.V., akademik

Crystalline structure of eudidymite ($\text{NaBeSi}_3\text{O}_7\text{OH}$). Dokl. AN SSSR 136
no.6:1448-1450 F '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova.
(Eudidymite)

YAMZIN, I.I.; NOZIK, Yu.Z.; BELOV, N.V., akademik

Neutron diffraction study of the cubic modification of PbF_2 . Dokl.
AN SSSR 138 no.1:110-111 My-Je '61. (MIRA 14:4)

1. Institut kristallografii AN SSSR.
(Lead fluoride)

SOLOV'YEVA, L.P.; BELOV, N.V., akademik

Crystalline structure of bertrandite $\text{Be}_4\text{Si}_2\text{O}_7(\text{OH})_2$. Dokl. AN SSSR
140 no.3:685-688 S '61. (MIRA 14:9)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Bertrandite)

189200

29117
S/020/61/140/005/013/022
B125/B138

AUTHORS: Ilyukhin, V. V., and Belov, N. V., Academician

TITLE: Crystal structure of rubidium-di(meta)-fluoberyllate RbBe_2F_5

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1066-1069

TEXT: Most of the publications on fluoberyllate systems have been issued by the Moscow laboratory of A. V. Novoselova (Usp. khim., 28, 33 (1959)) and the Leningrad laboratory of N. A. Toropov and R. G. Grebenshchikov (ZhNKh, 6, 4, 920 (1961), ZhNKh, 1, 12, 2686 (1956), ZhNKh, 1, 7, 1619 (1956), DAN, 114, 316 (1957)). Grebenshchikov Toropov also supplied the monocrystalline RbBe_2F_5 plates for the study here described. The

crystals are biaxial, have the low refractive index (1.332) characteristic of fluoberyllates, and a very low birefringence (≈ 0). They have perfect cleavage along plane (001). The crystals have specific gravity 2.809, are only slightly hygroscopic, and are subject to polymorphous transformations during heating. The crystals are triclinic, and one cell has the parameters $a = 7.98 \text{ \AA}$, $b = 4.69 \text{ \AA}$, $c = 6.12 \text{ \AA}$, $\alpha = 89^\circ 40'$, $\beta = 91^\circ$, $\gamma = 90^\circ 27'$ ($a:b \sim \sqrt{3}$). Reduction to the standard cell with three obtuse angles gives

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Crystal structure of...

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S/020/61/140/005/013/022
B125/B138

$a = 4.69 \text{ \AA}$, $b = 4.61 \text{ \AA}$, $c = 6.12 \text{ \AA}$, $\alpha = 90^\circ 27'$, $\beta = 90^\circ 20'$, $\gamma = 120^\circ 48'$,
 $a \approx b$, $\alpha \approx \beta \approx 90^\circ$, $\gamma \approx 120^\circ$, i.e., the pseudoorthohexagonal cell is replaced
by a pseudohexagonal primitive cell. The presence of piezoelectric effect,
together with statistical analysis of the structural factors, rules out
all symmetry groups except $P1$. The peaks of the Patterson syntheses
 $p(xz)$ and $p(yz)$ are indistinct. Table 1 shows the coordinates of the
seven basal atoms (21 parameters) for the $C1$ cell. In the indisputable
 BeF_4 tetrahedrons, the interatomic distances lie within the limits
 $\text{Be-F} = 1.43 - 1.48 \text{ \AA}$, $\text{F-F} = 2.33 - 2.41 \text{ \AA}$. In the RbF_6 octahedrons, the
 Rb-F distances remain within the limits $2.82 - 3.08 \text{ \AA}$. The principal
structure of Rb difluoberyllate is, in the authors' opinion, a close-
packed brucite (phlogopite) layer of Rb octahedrons, oriented parallel
to (001). A hexagonal-patterned network of fluoberyllate tetrahedrons
extends between the layers of Rb octahedrons. In the fluoberyllate analog,
the di(meta) silicate model, there are no layers consisting of empty
polyhedrons. The layer of tetrahedrons oriented in two directions along
the pseudohexagonal axis may be conveniently called "one-and-a-half-
storied". The fluoberyllate network characteristic of RbBe_2F_5 has the
same projection as all known silicic acid networks of the pseudohexagonal

Card 2/4

Crystal structure of...

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S/020/61/140/005/013/022
B125/B138

type. There are 4 figures, 1 table, and 16 references: 13 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: Intern. Tables for X-Ray Crystallogr. 1, 1952, p. 530; G. A. Sim, Acta Crystallogr., 11, 123 (1958); R. M. Douglass, Am. Miner., 43, 517 (1958).

SUBMITTED: , July 14, 1961

Table. Coordinates of basal atoms (in hundredth parts of the cell axes) in the structure of RbBe_2F_5 .

ATOMS	x	y	z	ATOMS	x	y	z
Rb	0	0	0	F ₄	25,0	33,4	52,5
F ₁	16,7	49,4	17,5	F ₅	31,9	00,4	80,0
F ₂	-2,5	49,5	47,0	Be ₁	15,0	54,5	41,3
F ₃	20,0	83,4	46,7	Be ₂	31,0	5,0	56,3

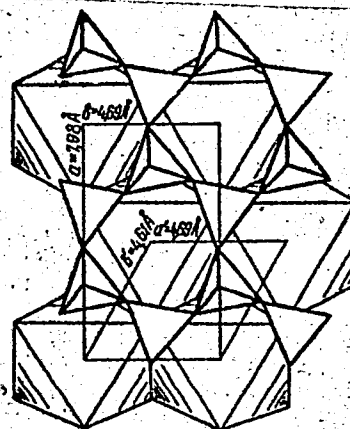
Card 3/4

Crystal structure of...

Fig. 1. The crystal structure (plan view) of Rb-di(meta)-fluoberyllate with alternating layers (brucite type) of Rb octahedrons and pseudohexagonal lattices $[\text{Be}_2\text{F}_5]_{\infty, \infty}$. A

pseudoorthohexagonal cell and a pseudohexagonal primitive cell are separately drawn.

29117
S/020/61/140/005/013/022
B125/B138



Card 4/4

FERSMAN, Aleksandr Yevgen'yevich, akademik; MAMUROVSKIY, A.A. [deceased], otv. red.; BELOV, N.V., akademik, red.; VINOGRADOV, A.P., akademik, red.; SHCHERBAKOV, D.I., akademik, red.; SAUKOV, A.A., red.; SHCHERBINA, V.V., doktor geol.-min. nauk, red.; POPOVA, T.S., red. izd-va; POPOVA, S.T., red.; PRUSAKOVA, T.A., tekhn. red.; GUSEVA, A.P., tekhn. red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad. nauk SSSR. Vol. 7. 1962. 592 p. (MIRA 15:10)

1. Chlen-korrespondent Akademii nauk SSSR (for Saukov).
2. Chlen-korrespondent Akademii stroitel'stva i arkhitektury SSSR (for Mamurovskiy).

(Precious stones)

BELOV, N.V., akademik, red.; GORSHKOV, A.M., nauchnyy red.; TYUTYUNIK, M.S., red.izd-va; SHEVCHENKO, T.N., tekhn. red.

[Checking, controlling, and improving techniques in the production of building materials] Kontrol', regulirovanie i sovershenstvovanie tekhnologii v proizvodstva stroitel'nykh materialov. Pod red. N.V.Belova. Moskva, Gosstroizdat, 1962. 158 p.
(MIRA 16:3)

1. Akademiya nauk SSSR. Komitet molodykh spetsialistov na obshchestvennykh nachalakh.

(Building materials industry)

BELOV, N.V.; ORGANOVA, N.I.

Crystallochemistry and mineralogy of the "lomonosovit" group
in the light of the crystalline structure of "lomonosovit"
[with summary in English]. Geokhimiia no.1:6-14 '62. (MIRA 15:2)
(Minerals)(Crystallography)

BAKAKIN, V.V.; BELOV, N.V.

Crystallochemistry of beryl. Geokhimiia no.5:420-433 '62.

(MIRA 15:7)

(Beryl crystals—Analysis)

BELOV, N.V.

Notes on structural mineralogy. Report No.13. Min. sbor. no.16;
14-44 '62. (MIRA 16:10)

1. Institut kristallografii AN SSSR, Moskva.
(Mineralogical chemistry)

BELOV, N.V.

Unusual forms of water inclusions in minerals. Trudy IGEM
no.70:5-8 '62. (MIRA 15:9)
(Thermal analysis)

36136

S/070/62/007/002/001/022

E132/E160

24,7/00

AUTHORS: Shuvalov, L.A., and Belov, N.V.

TITLE: The symmetry of crystals in which ferromagnetic and ferroelectric properties occur simultaneously

PERIODICAL: Kristallografiya, v.7, no.2, 1962, 192-194

TEXT: There are 90 black and white point groups of which 31 permit the occurrence of a magnetic polarisation M and a different 31 permit electric polarisation P . There are 10 groups common to the two categories, namely: $62'2'$; 6 ; $32'$; 3 ; $42'2'$; 4 ; $22'2'$; 2 ; $2'$; 1 . These are subgroups of $\infty 2'2'$. There are 3 further groups: $\infty m'2'$; m ; and m' , where the vectors \underline{M} and \underline{P} are constrained to be perpendicular. In all of the 10 groups mentioned first, except $2'$ and 1 where M and P may make any angle with each other, M and P must be parallel. The 101 space groups corresponding to these 13 point groups have been listed (Ref.4: N.N. Neronova, N.V. Belov, Kristallografiya, v.4, 1959, 807-812). The above has assumed that M and P belong to the same antisymmetry group, which is not necessarily the case. The relevant groups of double
Card 1/2

The symmetry of crystals in which ... S/070/62/007/002/001/022
E132/E160

antisymmetry are developed.
There are no figures or tables.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography, AS USSR)

SUBMITTED: December 20, 1961

Card 2/2

SMIRNOVA, N.L.; BELOV, N.V.

On two large groups of structural types corresponding to the formulae.
AX₂. Kristallografiia 7 no.5:671-679 S-O 162. (MIRA 15:12)

1. Institut kristallografii AN SSSR i Moskovskiy gosudarstvennyy
universitet imeni Lomonosova.
(Crystallography)

BELOV, N.V.; KUNTSEVICH, T.S.; NERONOVA, N.N.

Shubnikov groups (of antisymmetry) for infinite bilateral bands.

Kristallografiia 7 no.5:805-808 S-O '62.

(MIRA 15:12)

1. Institut kristallografi AN SSSR.
(Crystallography)

SMIRNOVA, N.L.; BELOV, N.V.

Structures from Thomson cubes with alternate bipyramidal nets having a cubic or diamond-type symmetry. Kristallografiia 7 no.6:826-834 N-D '62.
(MIRA 16:4)

1. Institut kristallografi AN SSSR i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Crystallography)

S/070/62/007/006/016/020
E132/E435

AUTHORS: Kuz'minov, Yu.S., Yamzin, I.I., Belov, N.V.

TITLE: The magnetic structure of yttrium ferrite

PERIODICAL: Kristallografiya, v.7, no.6, 1962, 946-948

TEXT: Neutron diffraction examinations were made of polycrystalline specimens of $Y_3Fe_5O_{12}$ at room temperature and at 300°C , which is above the Curie temperature. Very good agreement was obtained between the observed and calculated intensities. The nuclear contribution was calculated from the structure of S.Geller and M.A.Gillio (J. Phys. and Chem. Soc., v.3, 1/2, 1957). The magnetic contribution was calculated from Neel's model in which the spins of the Fe^{+++} ions occupying the octahedral positions (a) are antiparallel to the spins of the Fe^{+++} ions in the tetrahedral (d) positions. The ions in (a) positions were ascribed a room-temperature magnetic moment of $\mu_a = 4.60 \mu_B$ and the ions in (d) positions - $\mu_d = 4.16 \mu_B$. It was assumed that at 0°K the moment of the Fe^{+++} ions was $5 \mu_B$. The parameters assumed were: (in the space group $Ia\bar{3}d$)
O in general positions with $(x,y,z) = (-0.0247, 0.0572, 0.1492)$;
Card 1/2

The magnetic structure ...

S/070/62/007/006/016/020
E132/E435

Y in 24(c) positions. There are 2 figures and 1 table.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography AS USSR)

SUBMITTED: June 8, 1962

Card 2/2

S/070/62/007/006/017/020
E073/E335

AUTHORS: Kuz'minov, Yu.S., Yamzin, I.I., Mal'tsev, Ye.I. and
Belov, N.V.

TITLE: Determination of the amplitude of Raman scattering of
thermal neutrons on yttrium nuclei

PERIODICAL: Kristallografiya, v. 7, no. 6, 1962, 948 - 949

TEXT: The atlas of Hughes on neutron cross-section gives the
value $\sigma = (8.0 \pm 0.3) \times 10^{-24} \text{ cm}^2$. It can be calculated from this
value that $b_Y = 0.8 \times 10^{-12} \text{ cm}$. There was some doubt about
this value since the references given by Hughes did not contain
information on the scattering of neutrons on yttrium. The authors
of this paper determined b_Y from the measured intensity of
neutron diffraction on polycrystalline yttrium oxide, using a 15-mm
diameter, 70 mm high specimen pressed from powder of a grain size
between 1 and 5 μ . The value of b_Y was determined from tabulated
values of $b_0 = 0.58 \times 10^{-12} \text{ cm}^2$ and the structural model of
Card 1/2

Determination of

S/070/62/007/006/017/020
EO75/E335

yttrium oxide, as published by W. Zachariassen (Norsk. geol. tidsskr. 9, 310 - 316, 1926; Struct. Rept., 16, 218, 1952). The average of three measurements of the amplitude of the Raman scattering was

$b_y = (+0.816 \pm 0.07) \times 10^{-12}$ cm. There is 1 figure. ✓

ASSOCIATIONS: Institut kristallografi AN SSSR (Institute of Crystallography of the AS USSR)
Fiziko-tekhnicheskiy institut AN SSSR (Physico-technical Institute of the AS USSR)

SUBMITTED: June 8, 1962

Card 2/2

BELOV, N.V.

Seventy-five years of the study of space symmetry groups. Zap.
Vses. min. ob-va 91 no.1:3-13 '62. (MIRA 15:3)
(Crystallography)

BELOV, N. V.; SHAFRANOVSKIY, I. I.

Role of E. S. Fedorov in the prehistory of X-ray structural crystallography; 50th anniversary of the discovery of X-ray diffraction in crystals. Zap. Vses. min. ob-va 91 no.4: 465-471 '62. (MIRA 15:10)

(X-ray crystallography)

ASHIROV, A.; RUMANOVA, I.M.; BELOV, N.V., akademik

Crystalline structure of lesserite $[\text{Mg}(\text{B}_3\text{O}_3(\text{OH})_5)_2] \cdot 5\text{H}_2\text{O}$.
Dokl. AN SSSR 143 no.2:331-334 Mr '62. (NIRA 15:3)

1. Institut kristallografii AN SSSR
(Crvstallography)
(Minerals) ~

STISHOV, S.M.; BELOV, N.V., akademik

Crystalline structure of a new dense silica (SiO_2) modification.
Dokl. AN SSSR 143 no.4:951-954 Ap '62. (MIRA 15:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i
Institut fiziki vysokikh davleniy AN SSSR.
(Silica)

SHIBAYEVA, R.P.; BELOV, N.V., akademik

Crystalline structure of rosenbuschite $(Ca,Na)_3(Zr,Ti)[Si_2O_7]$
(O,F)₂. Dokl. AN SSSR 143 no.6:1428-1431 Ap '62. (MIRA 15:4)
(Minerals)

ABRASHEV, K.K.; BELOV, N.V., akademik

Crystalline structure of barilite ($\text{BaBe}_2\text{Si}_2\text{O}_7$). Dokl. AN SSSR 144
no.3:636-638 My '62. (MIRA 15:5)
(Minerals) (Crystallography)

SHIBAYEVA, R.P.; BELOV, N.V., akademik

Crystalline structure of wöhlerite $\text{Ca}_2\text{Na}(\text{Zr}, \text{Nb}) [\text{Si}_2\text{O}_7](\text{O}, \text{F})_2$.
Dokl. AN SSSR 146 no.4:897-900 0 '62. (MIRA 15:11)

1. Institut kristallografii AN SSSR.
(Wöhlerite)

RUDNEVA, A.V.; NIKITIN, A.V.; ~~BELOV, N.V.~~, akademik

Cefluorosil Ce-britholite. Dokl. AN SSSR 146 no.5:1182-1183 0 '62.
(MIRA 15:10)

(Britholite)

NIKITIN, A.V.; BELOV, N.V., akademik

Crystal structure of batisite $\text{Na}_2\text{BaTi}_2\text{Si}_4\text{O}_{14} = \text{Na}_2\text{BaTi}_2\text{O}_2[\text{Si}_4\text{O}_{12}]$.
Dokl. AN SSSR 146 no.6:1401-1403 0 '62. (MIRA 15:10)
(Batisite)

BORISOV, S.V.; BELOV, N.V., akademik

Crystalline structure of simpsonite $\text{Al}_4\text{Ta}_3\text{O}_{13}(\text{F}, \text{OH})$. Dokl.
AN SSSR 147 no.3:683-686 N '62. (MIRA 15:12)
(Simpsonite)

ASHIROV, A.; RUMANOVA, I.M.; BELOV, N.V., akademik

Crystalline structure of hydroboracite $\text{CaMgB}_6\text{O}_{11} \cdot 6\text{H}_2\text{O} =$
 $\text{CaMg}[\text{B}_3\text{O}_4(\text{OH})_3]_2 \cdot 3\text{H}_2\text{O}$. Dokl. AN SSSR 147 no. 5:1079-1082
D '62. (MIRA 16:2)

(Hydroboracite crystals)

BELOV, N. V.

"A new inventory of silicate and related radicals infinite in one dimension."

report submitted for 6th Gen Assembly, Intl Union of Crystallography, Rome,
9 Sep 63.

Inst of Crystallography, AS USSR, Moscow.

BAKAKIN, V. V.; BELOV, V. V.; PLYUSNINA, I. I.

"The crystal chemistry and infra-red spectra of beryl."

report submitted for 6th Gen Assembly, Intl Union of Crystallography, Rome,
9 Sep 63.

Inst Crystallography, AS USSR, Moscow.

N. V. BELOV (USSR)

"The principal magmatic process in the light of crystallochemistry."

Report presented at the Conference on Chemistry of the Earth's Crust,
Moscow, 14-19 Mar 63.

BELOV, N.V.

Concerning a fundamental generalization of V.I.Vernadskii.
Geokhimiia no.3:214-218 Mr '63. (MIRA 16:9)

1. Institute of Crystallography, Academy of Sciences, U.S.S.R.,
Moscow.

(Crystallography)

BELOV, N.V.

S/070/63/008/001/004/024
E132/E460

AUTHORS: Kuz'minov, Yu.S., Yamzin, I.I., Belov, N.V.

TITLE: A neutron diffraction study of an yttrium-neodymium ferrite with the garnet structure

PERIODICAL: Kristallografiya, v.8, no.1, 1963, 21-24

TEXT: A polycrystalline specimen of composition $1.5Y_2O_3 \cdot 1.5Nd_2O_3 \cdot 5Fe_2O_3$, prepared by ceramic techniques was examined at room temperature and at $360^\circ C$ (above the Curie point) by neutron diffraction. The wavelength was 1.11 \AA . R. Pauthenet (J.Appl.Phys., v.30, no.4, 1959, 290) proposed a scheme of interactions for garnet structures of composition $3M_2O_3 \cdot 5Fe_2O_3$ following Neel's analysis of spinels. 4 Fe ions are in octahedral positions 16(a), 6 Fe ions are in tetrahedral positions 24(d) and 6 rare earth ions are in 24(c) positions with coordination 8 (tetrag. anti-prism). He proposed that the sub-lattices a and d had a strong negative exchange interaction and that the sub-lattice c was magnetized anti-parallel to the resultant moment. The interaction c-d is weaker than a-d. K.P.Belov and L.A.Malevskaya, on the other hand, suggested that the c sub-lattice was not ferromagnetically ordered (Inv. AN Ser.fiz., Card 1/2)

A neutron diffraction ...

S/070/63/008/001/004/024
E132/R460

v.25, no.11, 1961, 1371-1375). The latter suggestion is here shown experimentally to be correct. The chemical unit cell was cubic, $Ia\bar{3}d$, with $a = 12.48 \text{ \AA}$ and extra lines were not observed. The intensities were measured and were also calculated. The differences between the intensities above and below the Curie point gave the magnetic contribution which was compared with that calculated from two sub-lattices (Belov) and from three (Pauthenet). Very good agreement with Belov's model was obtained. The conclusion was checked by examining a specimen of composition $1.5Y_2O_3 \cdot 1.5Nd_2O_3 \cdot 5Al_2O_3$ which should show extra lines if the Nd were ordered - these were not found. There are 2 figures and 1 table.

ASSOCIATION: Institut kristallografi AN SSSR.
(Institute of Crystallography AS USSR)

SUBMITTED: August 9, 1962

Card 2/2

SMIRNOVA, N.L.; BELOV, N.V.

Structural group of quartz. Kristallografiia 8 no.3:346-350
My-Je '63. (MIRA 16:11)

1. Institut kristallografi AN SSSR i Moskovskiy gosudarstven-
nyy universitet imeni Lomonoseva.

SHIBAYEVA, R.P.; SIMONOV, V.I.; BELOV, N.V.

Crystalline structure of the Ca, Na, Zr, Ti-silicate rosenbuschite
 $\text{Ca}_{3.5}\text{Na}_{2.5}\text{Zr}(\text{Ti}, \text{Mn}, \text{Nb})[\text{Si}_2\text{O}_7]_2\text{F}_2\text{O}(\text{F}, \text{O})$. Kristallografiia 8 no.4:506-
516 J1-Ag '63. (MIRA 16:9)

1. Institut kristallografii AN SSSR.
(Rosenbuschite crystals)

ZAGAL'SKAYA, Yu.G.; BELOV, N.V.

Crystalline structure of zunyite $\text{Al}_{13}(\text{OH})_{18}\text{Si}_{15}\text{O}_{20}\text{Cl}_7$ $[\text{Al}_{12}(\text{OH})_{18}\text{SiO}_4]_4$
 $[\text{Al}(\text{SiO}_4)_4]\text{Cl}$. Kristallografiia 8 no.4:533-537 J1-Ag '63.

(MIRA 16:9)

1. Institut kristallografii AN SSSR.
(Zunyite crystals)

L 19160-63

ACCESSION NR: AP3004095

EWP(q)/EWT(m)/EWP(B)/BDS . AFFTC/ASD JD

S/0070/63/008/004/0587/0594

AUTHOR: Belov, N. V.

TITLE: A new stock of one-dimensionally endless silicate and similar radicals

SOURCE: Kristallografiya, v. 8, no. 4, 1963, 587-594

TOPIC TAGS: radical, silicate, Si, O, Ge, P, Be, F, Zn, crystal, lattice, envelope, orthosilicate, diorthosilicate

ABSTRACT: This work is an expansion of an idea from the author's book (Kristallokhimiya silikatov s krupny*mi kationami. Izd-vo AN SSSR, M., 1961) that silica and silicate radicals in natural and synthetic silicates play the role of "protective envelopes" about other technologically more important structural components in the crystal lattice. He states that the first step in this "development" must be the formation of "piercing" silicate chains with somewhat the same metasilicate formula $[SiO_3]$ but with various forms adapted to the basic structural motif. This variety is attained by the simplest of means: by different proportions of the basic silicate increments (the orthogroup $[SiO_4]$ and the

Card 1/22

L 19460-63

ACCESSION NR: AP3004095

diorthogroup $[\text{Si}_2\text{O}_7]$) in the chain. A large part of the second group is necessarily tied up with large cations. The orthogroup is needed not only with small cations but also for more convenient linking of basic diorthogroups. The author points out a great number of structural arrangements, some known for a long time, some observed only in recent years (many in synthetic minerals), and now some altogether new ones. Nine new chains are discussed and are illustrated in Fig. 1 (see enclosure). Orig. art. has: 11 figures.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography, Academy of Sciences, SSSR)

SUBMITTED: 12Mar63

DATE ACQ: 15Aug63

ENCL: 01

SUB CODE: PH

NO REF SOV: 018

OTHER: 006

Card 212

POBEDIMSKAYA, Ye.A.; BELOV, N.V.

A useful theorem in structure (or lattice) crystallography. Kristallografiia 8 no.4:674-675 JI-Ag '63. (MIRA 16:9)

1. Institut kristallografii AN SSSR i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Crystallography, Mathematical)

L 19h62-63 EWP(q)/EWT(m)/BDS/EWP(B) AFFTC/ASD JD
ACCESSION NR: AP3004105 S/0070/63/008/004/0675/0677

AUTHORS: Kuz'minov, Yu. S.; Belov, N. V.

TITLE: Amplitude of coherent neutron scattering by gallium nuclei

SOURCE: Kristallografiya, v. 8, no. 4, 1963, 675-677

TOFIC TAGS: scattering, amplitude, neutrons, coherent scattering, Ga, Y, O, Fe, ferrite, ceramics, diffraction

ABSTRACT: The authors undertood this study because data for this factor are not given in the revised edition of G. E. Bacon's book (Neutron Diffraction. Oxford. 1962). Samples were prepared by ceramic procedures normally used to prepare ferrites. Cylinders 100 mm high and 10 mm in diameter were constructed from 20 separate plates. Results were obtained from diffraction intensities off various reflecting planes. These values, with corresponding amplitudes, are shown in Table 1 (see enclosure). "The authors express their thanks to Engineer Ye. I. Mal'tsev (FTI AN SSSR) for his aid in measurements on the investigated samples." Orig. art. has: 1 table.

Cord 1/02.

L 19462-63
ACCESSION NR: AP3004105

ASSOCIATION: Institut kristallografi AN SSSR (Institute of Crystallography,
Academy of Sciences, SSSR)

SUBMITTED: 29Dec62

DATE ACQ: 15Aug63

ENCL: 01

SUB CODE: PH

NO REF SOV: 003

OTHER: 004

Card 2/02

POBEDIMSKAYA, Ye.A.; BELOV, N.V.

Crystalline structure of mordenite (ptilolite)

$\text{Na}_8\text{Al}_8\text{Si}_{40}\text{O}_{96} \cdot 24\text{H}_2\text{O} = 8\text{NaAlSi}_5\text{O}_{12} \cdot 3\text{H}_2\text{O}$. Kristallografiia 8
no.6:919-921 N-D'63. (MIRA 17:2)

1. Institut kristallografii AN SSSR.

NIKITIN, A.V.; BELOV, N.V., akademik

Crystalline structure of clinohedrite $\text{Ca}_2\text{Zn}_2(\text{OH})_2\text{Si}_2\text{O}_7 \cdot \text{H}_2\text{O} =$
 $2\text{CaZn}[\text{SiO}_4] \cdot \text{H}_2\text{O}$. Dokl. AN SSSR 148 no.6:1386-1388 P '63.
(MIRA 16:3)

1. Institut kristallografii AN SSSR.
(Minerals) (Crystallography)