

WHITAKER, T.; SOLOV'YEV, S.N. [translator]; SOROKER, V.I., doktor tekhnicheskikh nauk, redaktor; KRUGLOV, S.A., redaktor; GLADKIKH, N.N., tekhredaktor

[Lightweight concrete in the United States. Translated from the English] Legkie betony v SShA. Perevod s angliiskogo S.N.Solov'eva, pod red. V.I.Sorokera. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 147 p. (MIRA 10:3)

(United States--Lightweight concrete)

SOLOV'YEV, S.N., inzh.

Precast reinforced concrete in the Novosibirsk Economic Region.
Bul. stroi. tekhn. 16 no.4:35-36 Ap '59. (MIRA 12:6)

1. Nauchno-issledovatel'skiy institut Stroyinformatsii Akademii
stroitel'stva i architektury SSSR.
(Novosibirsk Province--Precast concrete)

IYUITSAU, Aleksey Grigor'yevich; MER, N.I.; MERO, Ye.M.; RYBIN, N.G.;
ROZENVASSER, M.A.; SOLOV'YEV, S.N.; FILIMONOV, V.P.;
SHAROYKO, V.V.; MEREZHKO, V.G., retsenzent; USENKO, L.A.,
tekhn. red.

[On the road of great initiative] Po puti velikogo pochina.
Moskva, Transzheldorizdat, 1961. 75 p. (MIRA 15:2)

1. Zamestitel' nachal'nika Glavnogo upravleniya lokomotivnogo
khozyaystva Ministerstva putey soobshcheniya (for Merezko).
(Railroads—Employees—Labor productivity)

SOLOV'YEV, S.H.: TSYAKALO, A.G.

Container for feeding electrode rods into the bunker of an
electrode-coating press. Sbor.rats.predl.vnedr.v proizv. no.5:40
'60. (MIRA 14:8)

1. Zavod "Krasnyy Profintern".
(Feed mechanisms)

SOLOV'YEV, S.N., inzhener.

Working out specifications for parts of centrifugal overhung-type
pumps on the basis of elements of the theory of dimension diagrams.
Trudy VIGM no.13:62-87 '51. (MLRA 10:8)
(Centrifugal pumps--Specifications)

SOLOV'YEV, S.E.

Using hard alloy drills. Stan. 1 instr. 28 no.10:38-39 0 '57..
(Drilling and boring machinery) (MLBA 10:11)

USSR/Soil Science, Mineral Fertilizer.

I-3

Abs Jour: Referat.Zh.Biol., No. 16, 25 Aug, 1957, 69041

Author : Solovev, S.N.

Inst :

Title : Liming of Acid Soils in Some Countries of the British Empire.

Orig Pub: Udobrenie i urozhai, 1956, No. 5, 50-61.

Abstract: No abstract

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SOLOV'YEV, S.N., kand.yurid.nauk

Capital investments in the chemical industry of the United States.
Opyt stroi. no.30:104-130 '60. (MIRA 13:11)
(United States—Chemical industries)

TITLES: List of scientific research works and symposia of works of TsNIPI completed in 1956. Anon. (Perechen nauchno-issledovatel'skikh rabot i sbornikov trudov TsNIPI zakonchennykh v 1956 godu)
PERIODICAL: "Energomashinostroenie", (Power Machinery Construction), 1957, No. 3, p. 32, (U.S.S.R.)

ABSTRACT: Solov'ev, S.N. Investigations into the parameters of systems for purifying peat and wood generator gas (No. 282).

An investigation was made into the influence of a number of factors on the purification and cooling of the gas (the type of nozzle, the density of sprinkling, the water consumption, etc.) in application to a gas generator type OG-16 working on peat or wood.

Nosov, S.S. Investigation of stresses in parts of the crankshaft/connecting rod mechanism of heavily loaded engines. (No. 293).

The work is devoted to the development and introduction of a procedure for measuring stresses in parts of the crankshaft/connecting rod mechanism and results of measurements of dynamic stresses in these parts are given.

Levin, M.I. Investigation of a system of remote control for the operation of diesel installations (No. 239).

An investigation was made into systems based on available equipment of Soviet manufacture; special devices and systems were developed and investigated which can be used to solve problems of remote control in combination with other tasks in the automation of diesel engines. During the course of the

List of scientific research works and symposia of works of 319
IBNIDI completed in 1976. Anon. (Cont.)
Kornashako, V.O. Consideration and systematisation of data
on the wear of moving parts in diesel engines types Ch8.5/11;
Ch10.5/13; Ch12/14; D6; D50; Ch36/45; D and Dr30/50 and
8-DR43/61. (No. 249).

Nikitin, M.D. and Kalinovskiy, O.E. Investigation of wear
of piston rings and cylinder linings when running diesel
engines at higher than normal speed and pressure (No. 247).

The work demonstrates the possibility of using small
relative activity in investigating wear of diesel parts by a
radio-active method using a scintillation counter. A method
was developed for determining the wear of a diesel engine
cylinder liner by a method using radio-active isotopes. A
relationship is established between wear of the upper piston
rings and the cylinder liner and the r.p.m. and maximum
pressure of the cycle for a small four-stroke diesel engine.

Symposium No. 29. "Internal Combustion Engines"

The symposium contains articles describing investigations
into the combustion chamber and pistons of engine 1Ch10.5/13;
results are given of tests on an experimental engine 1Ch13/16
with a chamber in the piston when working with supercharging.
The question of corrosion properties of oils with additives
is considered and recommendations are made about oils to be
used in diesel engines with lead-bronze bearings.

Symposium No. 30. "Internal Combustion Engines and Gas
Generator Installations".

The symposium contains articles describing investigations

List of scientific research works and symposia of works³¹⁹
of TsNII completed in 1956. Anon. (Cont.)

work a system of telemeasurements of the conditions of a diesel installation suitable for operation over very great distances was made and investigated.

Volchok, L.Ya. Development of a procedure and apparatus for measuring the speed of pulsating flows of gas (No. 291).

A thermo-anemometer was developed for isometric flows using a tungsten wire 11 microns in diameter and experimental pick-ups were made. A special rig was designed and made for calibrating the thermo-anemometer and investigating the thermal inertia of fine wires. An investigation was made of the thermal inertia of fine wires from 11 to 50 microns in diameter with air flow speeds of 25 - 325 metres/second.

Frolov, F.A. Heat transfer and the hydraulic resistance of oil coolers with wire type turbulators within the tubes (No. 309).

An investigation was made of heat transfer in an oil cooler working on a circuit with oil inside a pipe with a wire turbulator and water outside the pipe. Formulae are given for the relationship between heat transfer and hydraulic resistance in the oil section of the cooler. An outline is given of the design of a new efficient and small oil cooler and results are given of tests on a cooler connected to a supercharged engine for purposes of comparison with design formulae

SOLOV'YEV, S.M., kand. tekhn.nauk, dotsent

Using the specifications of technological systems in
developing the processes of part manufacture. Vest.
mashinostr. 45 no.10:46-51 0 '65.

(MIRA 18:11)

HAZHBEUK-MELIKOVA, I., kandidat tekhnicheskikh nauk; SOLOV'YEV, S.

Glass blocks--efficient material for use in window apertures.
Stroi.mat., izdel. i konstr. 1 no.7:17-19 J1'55. (MIRA 8:11)

1. Starshii nauchnyy sotrudnik VNIIS (for Bazhbeuk-Melikova)
2. Nauchnyy sotrudnik Tsentral'nogo nauchno-issledovatel'skogo instituta promyshlennykh sooruzheniy (for Solov'yev)
(Glass construction)

SOLOV'YEV, S., arkhitektor.

Using rippled glass for covering light openings in roofs.

Stroi. mat. 2 no.11:24-25 N '56.

(MLRA 10:2)

(Glass) (Roofing)

SOLOV'YEV, S.P. Cand Tech Sci -- (diss) "Transparent guards
made of hollow glass blocks and corrugated glass". Mos, 1957.
10 pp 22 cm. (Acad of Construction and Architecture USSR.
Sci Res Inst of ^{Construction} ~~Architectural~~ Physics and ^{Enclosure} ~~Safety~~ Structures)
110 copies (KL, 9-57, 101)

- 24 -

GUSEV, N.M., doktor tekhnicheskikh nauk, professor; SOLOV'YEV, S.P., kandidat tekhnicheskikh nauk.

Using glass and reinforced concrete elements. Stroi. prom. 35 no.5:
27-32 My '57. (MIRA 10:6)

(Glass construction)

SKOBLOV, D.A., inzh., red.; ANDRIYEVSKIY, V.G., kand. tekhn. nauk,
red.; SOLOV'YEV, S.P., kand. tekhn. nauk

[Construction specifications and regulations] Stroitel'nye
normy i pravila. Moskva, Gosstroizdat. Pt.1. Sec.V. ch.20.
[Articles for filling openings and skylights] Izdeliia dlia
zapolneniia proemov i fonarei (SNiP I-V. 20-62). 1963. 6 p.
(MIRA 17:3)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam
stroitel'stva. 2. Gosstroy SSSR (for Skoblov). 3. Mezhdome-
stvennaya komissiya po peresmotru Stroitel'nykh norm i pravil
(for Andriyevskiy). 4. Tsentral'nyy nauchno-issledovatel'skiy
institut eksperimental'nogo proyektirovaniya zhilishcha Aka-
demii stroitel'stva i arkhitektury SSSR (for Solov'yev).

SOLOV'YEV, S.P., kand.tekhn.nauk; DUBOV, E.M., inzh.; KOLMOVSKOY, A.A., inzh.

Hermetic industrial buildings with exterior walls of glass reinforced
concrete. Prom. stroi. 41 no.2:9-12 F '64. (MIRA 17:3)

AUTHORS: Verbitskaya, T.N., Zhdanov, G.S., Venevtsev, Yu.N.^{70-3-2-9/26}
and Solov'yev, S.P.

TITLE: Electrical and X-ray Investigations of the System
 $BaTiO_3 - BaZrO_3$ (Elektricheskiye i rentgenograficheskiye
issledovaniya sistemy $BaTiO_3 - BaZrO_3$)

PERIODICAL: Kristallografiya, 1958, Vol. 3, Nr 2, pp 186 - 196
(USSR).

ABSTRACT: Various solid solutions of $BaTiO_3 - BaZrO_3$ were prepared, having up to 30 mol% of the latter, by heating appropriate mixtures of $BaCO_3$, TiO_2 and ZrO_2 at $1400 \pm 10^\circ C$. The resulting materials were examined by the Debye-Scherrer method with a camera of diameter 11.4 cm and Cr or Cu radiation. With Cr radiation the lines 310 and 222 occur at a sufficiently high angle to give accurate cell dimensions. (For Cu radiation the appropriate lines are 501 and 431) The significance of the splitting of the lines under the distortions observed is explained. Dimensional measurements were made to $\pm 0.001 \text{ \AA}$, monoclinic angle to $\pm 1.5'$, rhombohedral angle to $\pm 1'$ and axial ratio to ± 0.0005 .

Card 1/3 For the pure compounds the cell dimensions were found to be:-

Electrical and X-ray Investigations of the System ^{70-3-2-9/26} BaTiO₃ - BaZrO₃

BaTiO₃, $a = 3.990$, $c = 4.027$, $c/a = 1.0093$, $V = 64.12$; and
BaZrO₃, $a = 4.186$ and $V = 73.35$. From 0 to 2 mol% of
zirconate the dimensions of the tetragonal phase approached each
other slightly. From 2 to 6.5% the solid solution was pseudo-
monoclinic with $a = c$ and the monoclinic angle decreasing
from $90^{\circ} 08.5'$ to $90^{\circ} 04.0'$. From 6.5 to 20 mol%, the solution
was rhombohedral with the rhombohedral angle equal to $89^{\circ} 57'$
and increasing from 4.0177 to 4.0440. Above 20% the solution
was cubic with an increasing from 4.0447 to 4.0616 at 30%.
Over the whole range the volume of the unit cell increased
linearly from 64.12 to 67.00 Å³ with no breaks at the phase
transitions. In pure BaTiO₃ three phase transitions (all with
hysteresis) are observed on changing its temperature. They
are at 120° , $0-5^{\circ}$ and -70 to -80° C. These transition points
were measured for a range of compositions. Below 10% zirconate
all four phases occur at appropriate temperatures, between 10
and 15% there is a confused region and above 15% only the cubic
and rhombohedral phases occur. Measurements were also made of
the dielectric constant of the material at various temperatures

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70-3-2-9/26

Electrical and X-ray Investigations of the System BaTiO_3 - BaZrO_3

and compositions.

The phase diagram constructed is like that found for BaTiO_3 - BaSnO_3 by Smolenskiy and Isupov (DAN, 1954, Vol 96, 53) and not like that drawn up by Kell and Hellicar (Akustika, 1956, Vol 6, Nr 2, p 232).

There are 8 figures, 2 tables and 26 references, 10 of which are Soviet, 2 German and 14 English.

ASSOCIATION: Fiziko-khimicheskiy institut im. L.Ya. Karpova
(Karpov Physico-chemical Institute) and NII MRTP

SUBMITTED: July 18, 1957

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AUTHORS: Venevtsev, Yu.M., Zhdanov, G.S., Solov'yev, S.P. and Zubov, Yu.A. ^{SOV/70-3-4-11/26}

TITLE: The Internal Fields in Certain Ferro-electrics with Structures of the Perovskite Type (Vnutrenniye polya v nekotorykh segnetoelektrikakh so strukturoy tipa perovskita)

PERIODICAL: Kristallografiya, 1958, Vol 3, nr 4, pp 473-479 (USSR)

ABSTRACT: An analysis of the methods of calculating the internal field in ferro-electrics of the perovskite type is made. The internal fields and the spontaneous polarisation in the tetragonal modifications of $BaTiO_3$ and $PbTiO_3$ are calculated and the influence of certain cation parameters on these quantities is estimated. The structure was assumed, as a first approximation, to be built up of point charges and point dipoles. Kozlovskiy's method (Zh.Tekh. fiz., Vol 21, nr 11, p 1388, 1951) where the five different ions are attached to five separate sub-lattices was used. In $BaTiO_3$ the Ba ion was taken as the origin but in the $PbTiO_3$ the Ti in view of the reported displacements (Shirane, Pepinsky and Danner, Acta Crystall, 1956, Vol 9, p 131). Published polarisabilities were used.

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The Internal Fields in Certain Ferro-electrics with Structures of
the Perovskite Type

As the effective ionic charges were not known, a coefficient of charging $\gamma (0 \leq \gamma \leq 1)$, identical for all ions, was introduced. If for BaTiO_3 γ was taken as 1, then the calculated, spontaneous polarisation was twice the observed value. The value $\gamma = 1/2$ was therefore used for both BaTiO_3 and PbTiO_3 . The spontaneous polarisation when calculated was then near to the observed value and the internal fields were found to be BaTiO_3 : Ba, 0.04; Ti, 4.84; O_I , 3.66; O_{II} and O_{III} , 0.55. PbTiO_3 : Pb, 1.83; Ti, 8.62; $O_I = 7.02$; O_{II} and O_{III} , 2.23: in each case $\times 10^8$ V/cm. As the calculations were carried out with structure coefficients C_{ik} appropriate to a cubic structure, the approximation will be much better in the case of BaTiO_3 with $c/a=1.01$ than for PbTiO_3 with $c/a = 1.06$. The calculations were repeated with

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variations in certain of the parameters. For BaTiO_3 , a was varied 4.2 and to 3.9 Å; α (polarisability) of the Ti was doubled and halved; the charge distribution was tried as $\text{Ba}^{+1/2}$, $\text{Ti}^{+2.5}$; the polarisability α_{Ba} of the Ba ions was doubled and halved. Similar variations were made for PbTiO_3 . The relative influences of the various contributory effects were then apparent. The effects on the spontaneous polarisation were also found. The results are compared with those of other authors. There are 3 tables and 33 references, 13 of which are Soviet, 15 English and 5 German.

ASSOCIATION: Fiziko-khimicheskiy institut im. L.Ya. Karpova (Institute of Physical Chemistry imeni L. Ya. Karpov)

SUBMITTED: July 18, 1971.

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24(2), 24(3)

AUTHORS:

Venevisev, Yu. N., Zhdanov, G. S.,
Solov'yev, S. P.

SOV/48-22-12-17/33

TITLE:

~~Effect of Various Factors Upon the Curie Temperature of~~
Piezoelectrics With the Structure of the Perovskite Type
(Vliyaniye razlichnykh faktorov na temperaturu Kyuri
segnetoelektrikov so strukturoy tipa perovskita)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958,
Vol 22, Nr 12, pp 1476-1482 (USSR).

ABSTRACT:

The question concerning the Curie (Kyuri) T_k temperature of piezoelectrics having a perovskite structure, was already investigated earlier (Refs 1-7 and 8-11). The analysis of these papers shows that there is no uniform opinion on this problem. The conclusions drawn from references 1-7 are based on the assumption that in the investigated piezo- and anti-piezoelectrics the cations of the B-type are piezoactive. Actually, in some piezoelectrics the B-cations and in others the A-cations are piezoactive (Refs 8, 9, 13). As it was already stated (Ref 10), the results given in references 1-7 must be subjected to further examinations, because of the reason mentioned above. The classification of the piezo- and anti-piezoelectrics with perovskite structure depending on the

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Effect of Various Factors Upon the Curie Temperature SOV/48-22-12-17/33
of Piezoelectrics With the Structure of the Perovskite Type

type of the piezoactive cation , as proposed in references 8, 9, 13 promotes the solution of the problem discussed. Therefore, they have been investigated again in this paper. It was attempted to explain the differences of the Curie temperature in piezoelectrics with perovskite structure in the same way, by using only such characteristics as polarizability, charges and radii. The degree of covalence of the bindings in the respective compounds was neglected. The authors started from an approximate theoretical estimation. They used the results from references 15, 16, determined in the investigation of the effect of various parameters of cations upon the internal field of piezoelectrics with perovskite structure. The conclusions drawn on the basis of theoretical estimations agree with the few experimental results obtained by the authors of this article and Sawaguchi (Ref 7). As soon as new experimental data will be obtained it will be possible to check also the theoretical results still improved.

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Effect of Various Factors Upon the Curie Temperature SOV/48-22-12-17/33
of Piezoelectrics With the Structure of the Perovskite Type

There are 2 tables and 26 references, 12 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physico-Chemical Institute imeni L. Ya. Karpov)

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ZHDANOV, G. S.; SOLOV'YEV, Sergey Pavlovich; VSKOVTSOV, Yuriy Nikolayevich;
IVANOVA, V. V.

"Internal Fields in the Orthorombic Modification of
Barium Titanate"

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

AUTHORS: Venevtsev, Yu.N., Zhdanov, G.S., ^{SOV/70-4-2-26/36} Solov'yev, S.P. and Ivanova, V.V.

TITLE: On Internal Fields in Ferroelectric PbTiO_3 (O vnutrennikh polyakh v segnetoelektrike PbTiO_3)

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 2, pp 255-257 (USSR)

ABSTRACT: Calculations of the internal fields in PbTiO_3 crystals have been made by the Madelung-Hagedorn method (R. Hagedorn - Ref 3) which is more accurate than Kozlovskiy's method used before, according to the work of Yu.N. Venevtsev et al (Ref 1). These fields E_i are Pb 1.4, Ti 6.9, O_I 6.1 and O_{II} , O_{III} 1.8×10^8 V/cm. The contributions of the separate ions to the spontaneous polarisation of 81×10^{-6} coulomb/cm² are tabulated. The internal fields for model crystals of the PbTiO_3 type but with ions of different polarisability are similarly calculated. For BaTiO_3 the calculations by both methods

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On Internal Fields in Ferroelectric PbTiO_3

are in good quantitative agreement. Graphical examination of the parameters affecting the internal fields show their relative importance. In order they are: 1) lattice period; 2) charge on the ferroelectric cation; 3) polarisability of the ions of the oxygen octahedra; 4) polarisability of the ferroelectric cation; 5) polarisability of the non-ferroelectric cation. There are 1 figure, 2 tables and 5 references, 4 of which are Soviet and 1 German.

ASSOCIATION: Fiziko-khimicheskiy institut im. L.Ya. Karpova
(~~Physical-Chemical~~ Institute im. L. Ya. Karpov)

SUBMITTED: November 14, 1958

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AUTHORS: Venevtsev, Yu.N., ^{SOV/70-4-4-17/34} Solov'yev, S.P. and Zhdanov, G.S.
TITLE: On the Structural Coefficients of the Internal Field in
Ferroelectrics of the Perovskite Type
PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 4, pp 575-578 (USSR)
ABSTRACT: The notation is carried over from an article by the same
authors (Ref 1). The values of the projection of the
structural coefficients $S_l(x,y,z) \cong C_{ik}$ for different
orientations (cube edges, face or body diagonals) of the
dipoles in a cubic perovskite-type cell are tabulated in
terms of P and Q. (P = -15.04102 and Q = 4.33387).
The coefficients C_{ik} are dimensionless and numerically
equal to the field strength, additional to the Lorentz
field, due to the sub-lattice of unit dipoles of the k-th
sort of ion and acting on the i-th sort of ion. The
derivation of expressions such as :

$$S_2(0, 1/2, 1/2) = S_3(0, 1/2, 1/2) = Q/\sqrt{3}$$

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On the Structural Coefficients of the Internal Field in Ferro-
electrics of the Perovskite Type

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$$S_2(1/2, 0, 0) = S_3(1/2, 0, 0) = P/\sqrt{3}$$

is given but all the other values are tabulated.

There are 1 table and 1 Soviet reference.

ASSOCIATION: Fiziko-khimicheskiy institut im. L.Ya. Karpova
Physico-chemical Institute imeni L. Ya. Karpov)

SUBMITTED: June 23, 1958

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24.2800, 24.7700

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SOV/70-4-6-9/31

AUTHORS: Zhdanov, G. S., Solov'yev, S. P., Venevtsev, Yu. N.,
Ivanova, V. V.

TITLE: Internal Fields in the Orthorhombic Modification of
BaTiO₃

PERIODICAL: Kristallografiya, 1959, Vol 4, N 6, pp 855-861 (USSR)

ABSTRACT: Internal fields in orthorhombic (pseudomonoclinic) barium titanate are computed according to ionic-displacement data reported in Phys. Rev., 105, 3, 856, 1957. Computations are based on the assumption that point ionic charges are displaced parallel to the edges of monoclinic unit cells, twice as small as orthorhombic cells, and are superposed by the similarly displaced point dipole moments. The latter's magnitude is determined as the product of ionic polarization and the affecting internal field. The known equation:

$$E_x = p_x \sum \frac{2x_i^2 - y_i^2 - z_i^2}{(x_i^2 + y_i^2 + z_i^2)^{3/2}} + p_y \sum \frac{3x_i y_i}{(x_i^2 + y_i^2 + z_i^2)^{3/2}} + p_z \sum \frac{3x_i z_i}{(x_i^2 + y_i^2 + z_i^2)^{3/2}}$$

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that defines the field along the X axis in terms of equal dipoles p and coordinates x_1, y_1, z_1 of 1-th dipole, is reduced, substituting the three sums, for the sake of brevity, by h_{xx}, h_{xy}, h_{xz} . In cubic and tetragonal BaTiO₃, h_{xy}, h_{xz}, h_{yz} are equal to zero. Using various calculation methods the authors proved that h_{xy} in "monoclinic" BaTiO₃ is vanishingly small relative to h_{xx} and can be disregarded, while h_{xz} remains about the same as in cubic BaTiO₃. Thus dipole moments p_k for each projection upon 1(x,z) axis become defined by:

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$$\sum_{k=1}^5 (\delta_{1k} - (h_{11})_{1k}) \frac{p_k \cos \varphi_{k1}}{r} = \sum_{k=1}^5 \frac{e_k}{a^3} (f_{1k})_{1k}$$

where $k = 1, 2, \dots, 5$ is number of unlike atoms in the unit cell; e_k is charge of a k-type ion; a and c are edgelengths of monoclinic cells; $(f_{1k})_{1k}$ is structure factor whose magnitude equals the field intensity affecting 1-th atom in the sublattice formed by k-type atoms; φ_{k1} is angle between 1 axis and k-type dipole;

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Modification of BaTiO₃

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$$\delta_{ik} = \begin{cases} 0 & \text{for } k \neq i \\ \frac{1}{a_i} & \text{for } k = i; \end{cases}$$

Spontaneous polarization is computed according to:

$$P_{s_i} = \sum_{k=1}^6 \frac{P_k \cos \varphi_{k1}}{v} + \sum_{k=1}^6 \frac{e_k \cdot d_{k1}}{v}$$

where s_{k1} denotes displacement of k-type atoms along 1 axis. The computed values (Table 2) are about the same as in tetragonal BaTiO₃. The computed spontaneous polarization proved to be equal to the experimental one. Ti atoms are subjected to the highest field intensity and Ba atoms to the lowest. The fields affecting both atoms and oxygen O_{II} are parallel to the polar axis and to the displacements of the respective atoms, while the fields affecting O_I and O_{III} are symmetrically inclined to the polar axis; they are under 29° to the displacement directions, and 9°30' to X and Z axes.

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Modification of BaTiO₃

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TABLE

ION	$E_i \cdot 10^{-3}, v/cm$			$P_i = 3.1 \cdot 10^{-9} k/cm^2$ $P_{ix} = -2.2 \cdot 10^{-9} k/cm^2$ $P_{iz} = 2.2 \cdot 10^{-9} k/cm^2$					
	E_x	E_y	E	$(P_{ix} + P_{iz}) \cdot 100\%$		$P_{iy} \cdot 100\%$		$P_{iz} \cdot 100\%$	
				P_{ix}		P_{iy}		P_{iz}	
	x	z	x	z	x	z	x	z	
Ba	-0,08	0,08	0,12	-1,3	1,3	-1,3	1,3	0	0
Ti	-3,60	3,60	5,09	-15,0	15,7	-5,3	5,3	-9,7	9,7
O _I	-0,44	2,62	2,66	-12,3	57,1	-8,3	40,0	-4,1	7,2
O _{II}	-0,47	0,47	0,67	-13,8	13,8	-9,0	9,0	-4,8	4,8
O _{III}	-2,62	0,44	2,66	-57,1	12,3	-40,9	8,3	-7,2	4,0

Assistance of the late G. I. Skanavi is acknowledged.
There are 3 figures; 3 tables; and 11 references,
4 U.S., 3 Soviet, 2 German, 2 Danish. The U.S.
references are: G. Shirane, H. Danner, R. Pepinsky,
Phys. Rev., 105, 3, 856, 1957; J. C. Slater, Phys.
Rev., 78, 748, 1950; S. Triebwasser, J. Phys. Chem.
Solids, 3, 1/2, 53, 1957; H. H. Wieder, Phys. Rev.,
99, 1161, 1955.

Card 4/5

Internal Fields in the Orthorhombic
Modification of BaTiO_3

77108
SOV/70-4-6-9/31

ASSOCIATION: Physicochemical Institute imeni L. Ya. Karpov
(Fiziko-khimicheskiy institut imeni L. Ya. Karpova)

SUBMITTED: September 16, 1959

Card 5/5

BOLOV'YAN, S. I., Cand Phys-Math Sci -- (diss) "Crystallochemical investigation of antiseignettoelectrical material with the perovskite structure." Moscow, 1960. 12 pp; (Academy of Sciences USSR, Inst of Crystallography); 150 copies; price not given; list of author's works on pp 11-12; (KL, 51-60, 116)

GOL'DEN, G.A. [translator]; DUDAREV, V.Ya. [translator]; SLOV'YEV,
S.P. [translator]; ZHDANOV, G.S., red.; LAMIN, S.I., red.;
BELEVA, M.A., tekhn. red.

[Annihilation of positrons in solids] Annigiliatsiia po-
zitronov v tverdykh telakh; sbornik statei. Moskva, Izd-vo
inostr. lit-ry, 1960. 228 p. (MIRA 15:3)
(Positrons)

82509

544600(A)
247900

S/070/60/005/004/009/012

AUTHORS: Venevtsev, Yu.N., Zhdanov, G.S., Solov'yev, S.P.,
Bezus, Ye.V., Ivanova, V.V., Fedulov, S.A. and
Kapyshev, A.G.

TITLE: Crystal Chemical Investigations of Substances with
the Perovskite Type of Structure Which Has Special
Dielectric Properties 1

PERIODICAL: Kristallografiya, 1960, Vol. 5, No. 4.
pp 620 .. 626

TEXT: In $BaTiO_3$ the dielectrically-active ion is the Ti but
in $PbTiO_3$ it is the Pb ion. The $(Pb.Ba)TiO_3$ system may, there-
fore, be expected to show peculiarities where these two effects
interact. The variation in structure, dielectric and piezo-
electric properties is not continuous from one end-member to
the other. Experimentally, solid solutions with 7, 9, 11, 14
and 24 wt. % $PbTiO_3$ showed anomalies not explicable as due to
loss of PbO . $NaNbO_3$ undergoes several phase transitions in a
short temperature interval. Dielectric and optical observations
give transitions at 360, 470, 520 and 640 °C. X-ray data contra-
dict all but the first of these. Polycrystalline material was
Card 1/4

82509

S/070/60/005/004/009/012

E132/E360

Crystal Chemical Investigations of Substances with the Perovskite Type of Structure Which Has Special Dielectric Properties

studied by X-ray methods up to 700 °C and transitions at 360, 430, 470, 520 and 640 °C were found. Below 360 °C NaNbNO_3 is monoclinic with $a \neq c \neq b$ and $\beta > 90^\circ\text{C}$. Above 360 °C it is monoclinic with $a = c \neq b$ and $\beta > 90^\circ\text{C}$ (true symmetry orthorhombic). The transition from orthorhombic to tetragonal is not at 360 but at 430 °C. The X-ray method is no less sensitive than the optical and dielectric methods. From an examination of solid solutions $\text{BaTiO}_3 \cdot (\text{Ca}, \text{Sr})(\text{Zr}, \text{Sn})\text{O}_3$,

it is concluded that, other things being equal, the Curie temperature of perovskite-type ferroelectrics is higher, the smaller is the period of the lattice and the higher is the polarisability of the active cation.

BiTiO_3 with added $\text{Bi}_2\text{O}_3 \cdot \text{Cr}_2\text{O}_3$ and $\text{Bi}_2\text{O}_3 \cdot \text{Al}_2\text{O}_3$ has been synthesised and specimens showed properties like those found in BaTiO_3 containing $\text{Bi}_4\text{Ti}_5\text{O}_{12}$.

Card 2/4

82509

S/070/60/005/004/009/012

Crystal Chemical Investigations of ^{E152/E360}Substances with the Perovskite Type of Structure Which Has Special Dielectric Properties

BiFeO_3 and specimens in the system PbTiO_3 - BiFeO_3 have been synthesised. The former has a rhombohedral distortion ($a = 3.963 \text{ \AA}$, $\alpha = 89^\circ 24'$) and a susceptibility about 80. At 200°C the susceptibility has a maximum of about 1200. In the solid solution up to 70% by wt. of BiFeO_3 there is also a tetragonal modification. The Curie point of BiFeO_3 appears to be higher than that of PbTiO_3 . ✓

General methods for calculating the internal field have been developed for structures of any dipole configurations. These have been applied to the orthorhombic structure of CaTiO_3 .

Here, the internal electric field is zero at the Ti sites. There are 29 references: 2 Japanese (in English), 8 English, 2 international, 1 Swiss, 1 German and 15 Soviet.

Card 3/4

82509

S/070/60/005/004/009/012

E152/E360

Crystal Chemical Investigations of Substances with the Perov-
skite Type of Structure Which Has Special Dielectric
Properties

ASSOCIATION: Fiziko-khimicheskiy institut
im. L. Ya. Karpova ✓
(Physico-Chemical Institute imeni
L.Ya. Karpov)

SUBMITTED February 23, 1960

Card 4/4

S/070/60/005/005/006/017
E132/E360

AUTHORS: Solov'yev, S.P., Venevtsev, Yu.N. and
Zhdanov, G.S.

TITLE: On a Method of Calculating the Internal Fields in
Complex Dipole Structures

PERIODICAL: Kristallografiya, 1960, Vol. 5, No. 5,
pp. 718 - 725

TEXT: A method is proposed for calculating the internal field in complex dipole structure. In general, the problem comes down to the solution of a system of linear equations with $3m$ unknowns, where m is the number of atoms in the elementary cell. If the symmetry of the structure is taken into account the number can be decreased to $3n$ where n is the number of complexes and where n is less than m . Ewald's method can be successfully applied to calculating all the structure sums necessary for estimating the fields. The method is generally applicable in all cases where the structure has been determined. The calculation of the structure sums enables the idealisation of the structure to be avoided as these sums can be calculated in any case. Sometimes, however, in spite of the methods

Card 1/2

S/070/60/005/005/006/017
E132/E360

On a Method of Calculating the Internal Fields in Complex Dipole Structures

available for reducing the tediousness of the calculation of the fields in real structures, the number of unknowns may be too big to enable the system of equations obtained to be solved by hand methods. This raises no difficulty as modern computing machines can deal with such systems of equations with extreme speed. In fact, the systematic calculation of the fields in real antiferroelectric crystals and in other structures is best done by a machine appropriately programmed. ✓

There are 1 figure and 14 references: 5 Soviet, 1 Swiss, 5 English and 3 German.

ASSOCIATION: Fiziko-khimicheskiy institut imeni
L.Ya. Karpova (Physics-chemical Institute
imeni L. Ya. Karpov)

SUBMITTED: March 1, 1960

Card 2/2

24,7800(1142,1144,1162)

84996

S/048/60/024/010/005/033
B013/B063

AUTHORS: Solov'yev, S. P., Venevtsev, Yu. N., Zhdanov, G. S., and Ivanova, V. V.

TITLE: Method of Calculating Inner Electric Fields in Complicated Dipole Structures and Their Application to CaTiO₃ -1

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 10, pp. 1191 - 1194

TEXT: A general method is suggested for calculating the inner electric fields in complicated structures, in which there may take place both parallel and antiparallel ionic displacements in an arbitrary direction. This method, which was applied to the calculation of fields in CaTiO₃ type crystals, constitutes a generalization of the methods that are used for calculating the fields in piezoelectric substances of an ABO₃-type structure, and proceeds from the respective structure model of the compound concerned. A total of six different cases were examined. The calculation was made at the vychislitel'nyy tsentr MGU (Computer Card 1/4

84996

Method of Calculating Inner Electric Fields in S/048/60/024/010/005/033
Complicated Dipole Structures and Their 3013/BC63
Application to CaTiO_3

Center of MGU) with the computer "CPEBA" (Strela). The calculation of the fields in CaTiO_3 shows that the distribution of fields in this compound depends only little on the polarizability of Ca ions. It is all the more dependent, however, on the effective ion charge. up to the change of the signs of the fields acting upon the oxygen ions, although the qualitative picture remains unchanged. The fields acting upon Ca ions are only little varied in this connection. In all of the six cases examined the fields are considerably smaller than is the case with the piezoelectric ABO_3 compounds. In this case, as may be seen from the structure symmetry, the field acting upon the Ti ions is exactly vanishing. In BaTiO_3 and PbTiO_3 (Refs. 8 and 9), on the contrary, fields of maximum strength act upon the Ti ions. The basic difference between the fields in CaTiO_3 and in the piezoelectric ABO_3 compounds related to it, is connected with the fact that in the latter the octahedra are greatly deformed, while they are nearly ideal in CaTiO_3 . The relationship

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84996

Method of Calculating Inner Electric Fields in
Complicated Dipole Structures and Their
Application to CaTiO_3 S/048/60/024/010/005/033
B013/B063

between the anomaly of dielectric properties and the deformation of BO_6 octahedra can be also observed in the case of such ABO_3 compounds as are, e.g., PbZrO_3 , PbHfO_3 , KaNbO_3 . It can be stated that the presence of a deformation of B - O is an indispensable prerequisite for an anti-piezoelectric phase transition. The authors thank N. P. Trifonov, collaborator of the computer center of MGU for his assistance in the computations. The present paper was read at the Third Conference on Piezoelectricity, which took place in Moscow from January 25 to 30, 1960. There are 1 figure and 12 references: 4 Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute imeni L. Ya. Karpov)

Card 3/4

30

20024

S/070/61/006/001/002/011
E032/E314

7.2181 (2303, 1144)

24.7800 (1142, 1385, 1136)

AUTHORS: Solov'yev, S.P., Venevtsev, Yu.N., Zhdanov, G.S.
and Ivanova, V.V.

TITLE: Calculation of Internal Electric Fields in
Perovskite Crystals (CaTiO_3)

PERIODICAL: Kristallografiya, 1961, Vol. 6, No. 1,
pp. 78 - 85

TEXT: In a previous paper (Ref. 13) the present authors gave an account of a general method for the calculation of internal fields in structures having an arbitrary disposition of dipoles. The aim of the present paper is to apply this method to the calculation of fields in the antiferro-electric dipole structure of CaTiO_3 , using a model based on the real structure reported by Kay and Baily in Ref. 14. In the method described by the present authors in Ref. 13, it is assumed that the polarisabilities and effective ion charges are known. The polarisabilities of Ca and O ions were taken from the book by Kittel' (Ref. 15) ($\alpha_{\text{Ca}} = 1.1 \cdot 10^{-24} \text{ cm}^3$),

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20024

S/070/61/006/001/002/011
E032/E314

Calculation of Internal Electric Fields

$\alpha_0 = 2.4 \times 10^{-24} \text{ cm}^3$). It is further assumed that the effective charges of the ions in BaTiO_3 are approximately equal to one-half of the total ion charges. In order to estimate the effect of the assumed magnitude of the charges and polarisabilities on the field distribution six different variants of the calculation were carried out, in which the charges and polarisabilities were varied within reasonable limits. The results obtained are summarised in Table 3, which gives the internal fields in CaTiO_3 . The first five variants are based on the real structure of CaTiO_3 , shown in Fig. 2. For comparison, variant 6 is based on values of the f and h sums calculated for undispersed positions of the ions. All the calculations were carried out on the electronic computer "Strela" at the Computation Centre of MGU.

Card 2/5

2007,

S/070/61/006/001/002/011
E052/E314

Calculation of Internal Electric Fields

Acknowledgments are expressed to N.P. Trifonov and
A. Tel'nova of the Computation Centre of MGU, who carried
out the numerical calculation on the "Strela" computer.
There are 2 figures, 3 tables and 17 references: 7 Soviet
and 10 non-Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L.Ya.Karpova
(Physicochemical Institute im. L.Ya. Karpov)

SUBMITTED: March 1, 1960

Card 3/5

2002h

S/070/61/006/001/002/011
E032/E314

Calculation of Internal Electric

Table 3: 1 - Variants; 2 - $E \cdot 10^{-8}$, V/cm; 3 - Projection Axis;
CGSE = esu

E · 10 ⁻⁸ в/см	Ось проек- ции	ВАРИАНТЫ					
		1	2	3	4	5	6
		1/2 Ca: 0 Ca = 1.0 Ti = 2.0 O = -1.0	2 Ca: 0 Ca = 1.0 Ti = 2.0 O = -1.0	3 Ca: 0 Ca = 0.3 Ti = 2.5 O = -1.0	Ca: 0 Ti = 1.5 O = -1.0	Ca = 1.1 · 10 ⁻⁸ см ² ; O = 2.1 · 10 ⁻⁸ см ² ; Ca = 1.0 CGSE; Ti = -2.0 CGSE; O = -1.0 CGSE	
E _{Ca}	X	-0,0708	-0,136	-0,0972	-0,0720	-0,0840	-0,0072
	Y	0	0	0	0	0	0
	Z	0,494	0,751	0,517	0,601	0,557	0,422
E _{Ti}	X	0	0	0	0	0	0
	Y	0	0	0	0	0	0
	Z	0	0	0	0	0	0
E _{O1}	X	0,767°	0,876°	2,053°	-0,477	0,792°	0,856°
	Y	0	0	0	0	0	0
	Z	0,0215	0,302	-0,499°	0,680	0,0906	-0,0714°
E _{O11}	X	0,470°	0,546°	0,928°	0,0578°	0,489°	0,544°
	Y	-0,875	-0,892	-1,887	0,134°	-0,880	-0,042
	Z	-0,6066	-0,085	-0,570	0,519	-0,0258	-0,520

esu

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20024

10/61/006/001/002/011
E052/E314

Calculation of Internal Electric Fields

Fig. 2:

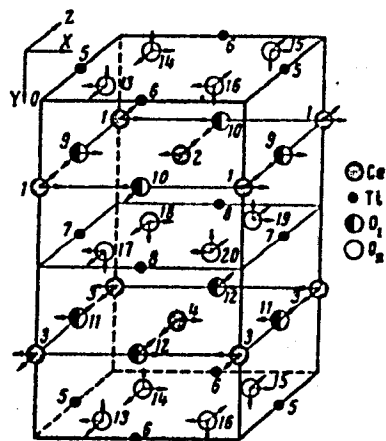


Рис. 2. Элементарная ячейка CaTiO₃.

Card 5/5

SOLOV'YEV, S.P.; ~~VEKHTOV, Ya.L.~~; ZHDANOV, G.S.

X-ray diffraction study of phase transitions in NaNbO_3 . *Kris-*
tallografiia 6 no.2:218-224 Mr-Ap '61. (MIRA 1:9)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova.
(Sodium niobate) (X rays--Diffraction)

VENEVTSSEV, Yu.M.; SOLOV'YEV, S.P.; ZHDANOV, G.S.

Methods for the X-ray diffraction study of small deformations
of cubic primary cells. Zav.lab. 27 no.9:1112-1115 '61.

(MIRA 14:9)

1. Nauchno-issledovatel'skiy fiziko-khimicheskiy institut
imeni L.Ya. Karpova.

(Electric batteries)

(X-ray--Diffraction)

S/181/62/004/012/027/052
B125/B102

AUTHORS: Lyubimov, V. N., Venevtsev, Yu. N., Solov'yev, S. P.,
Zhdanov, G. S., and Bakushinskiy, A. B.

TITLE: The dipole structure and the internal electric fields in
PbZrO₃

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3543-3550

TEXT: The most probable values of the internal electric fields and field-induced electron dipoles are calculated for a PbZrO₃ crystal on the basis of the model of point dipole structure. Using the method developed by S. P. Solov'yev, Yu. N. Venevtsev, G. S. Zhdanov (Kristallografiya 3, 473, 1958), the determination of the 28 different projections of the electron dipole moments was reduced to the solution of a system of 28 linear algebraic equations for 28 unknowns. The structural sums which are necessary for the set-up of these equations describe the fields of the infinite sublattices of the unit charges and unit dipoles, the number of which exceeds by far 1000. Both the structural sums and the system of

Card 1/3

The dipole structure and the ...

S/181/62/004/012/027/052
B125/B102

equations itself were calculated in various modifications using the electronic computer "Strela". The effect of all structure sublattices on each of the 40 atoms incorporated in the elementary cell was taken into account. The variant P_S was determined by extrapolation for the parameters $e_{pb} = 1.27$, $e_{Zr} = 1.73$, $e_0 = -1$, $\alpha_{pb} = 4.32 \cdot 10^{-24} \text{ cm}^3$, $\alpha_{Zr} = 0.80 \cdot 10^{-24} \text{ cm}^3$, $\alpha_0 = 2.26 \cdot 10^{-24} \text{ cm}^3$. e_i denotes the effective charges and α_i denotes the electron polarizabilities of the ions. The small value of P_S within a certain temperature interval makes it possible to establish a correlation between the data obtained from structure and those from dielectric studies. At room temperature, the ion polarization for the above-mentioned values of the parameters is compensated by electron polarization. Hence, the PbZrO_3 crystal is antipolarized and very similar to an anti-electret. Results, similar in principle, are obtained for any of the ten crystallographic polar classes of pyroelectrics (electrets). It is assumed that at least the direction of most of the projections of the electron dipole moments and of the internal fields corresponds to the

Card 2/3

S/181/62/004/012/027/052
B125/B102

The dipole structure and the ...

real structures of PbZrO_3 at room temperature. The displacement of the atoms may be attributed to nonelectrostatic forces. The highest field strength acts on the Zr ion. In general the internal field strength increases with decreasing ion polarizability. The rules found for PbZrO_3 resemble those governing the ferroelectric crystals BaTiO_3 and PbTiO_3 . It would be useful to investigate PbZrO_3 under pressure. There are 7 tables.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva
(Physicochemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 9, 1962

Card 3/3

SOLOVYEV, S. P.; LYUBIMOV, V. N.; VENEVTSEV, Yu. N.; ZHDANOV, G. S.

"The calculations of the internal electric fields and electric-field gradients in the perovskite-type compounds with special dielectric properties."

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

Karpov Inst of Physical Chemistry, Moscow.

VENEVASSOV, Yu. N., LYUBIMOV, V. N. , SOLOV'YEV, S. P., Viskov, A. S. and ZHDANOV, G. S.

"Calculation of Internal Electric Fields and Field Gradients in Perovskite Type Compounds with Special Dielectric Properties."

report presented at the Symposium on Ferroelectricity and Ferromagnetism, Leningrad, 30 May - 5 June 1963.

SOLOV'YEV, S. P.

"The calculations of the internal electric fields and electric-field gradients in the perovskite-type compounds with special dielectric properties."

report presented at the Symposium on Phase Transitions in Solids, 6th General Assembly, Intl. Union of Crystallography, Rome, Italy, 16-18 Sept 1963.

(Karpov Institute of Physical Chemistry, Moscow, USSR)

ACCESSION NR: AP4030634

S/0048/64/028/004/0630/0635

AUTHOR: Venovtsev, Yu.N.; Lyubimov, V.N.; Solov'yev, S.P.; Zhdanov, G.S.

TITLE: Calculation of the internal electric fields and their gradients in perovskite compounds with distinctive dielectric properties Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1963

SOURCE: AN SSSR. Izv.Ser.fiz., v.28, no.4, 1964, 630-635

TOPIC TAGS: internal field , crystal internal field , perovskite structure, ferroelectricity, ionic ferroelectricity model, ferroelectric compound

ABSTRACT: For a number of years the authors have been engaged in calculating the internal electric fields in compounds having the perovskite structure and peculiar dielectric properties. The methods of calculation and the results have been reported in a series of papers appearing in Kristallografiya (Crystallography) and Fizika tverdogo tela (Solid State Physics) from 1958 to 1962. The results of these calculations are discussed in the present paper. The calculations were based on the ionic model of a crystal with known or assumed structure. The charges and polarizabilities of the point ions were treated as given quantities, but the induced dipole moments

Card 1/3

ACCESSION NR: AP4030634

were calculated. Calculations were performed for several values of the charge, polarizability, and radius of the ions; reasonable variations of these parameters did not alter the qualitative picture of the fields in the six compounds investigated (lead, barium, calcium and cadmium titanates, sodium tantalate, and lead zirconate). Good agreement was obtained between observed and calculated values of the spontaneous polarization with the value 0.5 for the ionic charge factor. The results of the calculations indicate that NaTaO_3 and CdTiO_3 are ferroelectric materials and that PbZrO_3 is a ferroelectric material with nearly antiferroelectric properties. The internal field at the position of the Ti ion was found to vanish in CaTiO_3 but to be large in BaTiO_3 and PbTiO_3 . This difference in the fields accounts for the different dielectric behavior of these materials. Because of the strong field at the Ti ion, the conclusion of H.D. Megaw (*Acta crystallogr.*, 5, 739, 1952; *Ibid.*, 7, 187, 1954) that the principal factor in ferroelectric transitions of ABO_3 type materials must be a sharp increase in the covalent character of the B-O bond is regarded as inadequately grounded. It is concluded that further theoretical and experimental investigation of the possibilities of the ionic model is desirable, and improved calculations of field gradients are promised for the near future. Orig.art.has: 1 table.

Card 2/3

KAPYSHEV, A.G.; VENEVTSEV, Yu.N.; SOLOV'YEV, S.P.; GORBUNOV, L.A.;
ZHDANOV, G.B.

X-ray chambers for high-temperature studies. Zav. lab. 3C no.10:
1274-1276 '64. (MIRA 1374)

1. Nauchno-issledovatel'skiy fiziko-khimicheskiy institut imeni
Karpova.

SOLOV'YEV, S.P.; DOLIVO-DOBROVOL'SKIY, V.V.

Report on the activity of the Mineralogical Society of the
U.S.S.R. for 1964. Zap. Vses. min. ob-va. 94 no.4:486-495 '65.
(MIRA 18:9)

1. Vitse-prezident Vsesoyuznogo mineralogicheskogo obshchestva
(for Solov'yev). 2. Uchenyy sekretar' Vsesoyuznogo mineralogi-
cheskogo obshchestva (for Dolivo-Dobrovolskiy).

SOLOV'YEV, S.P., prof.; SHAFRANOVICH, I.I., prof.

Boris Mikhailovich Kupletskii, 1894-1965, an obituary.
Zap.Vses.min.ob-va 94 no.5:620-621 1965.

(MIRA 18-91)

1. Deystvitel'nyye chleny Vsesoyuznogo mineralogicheskogo
obshchestva.

SOLOV'YEV, S.P., prof.

Main chemical characteristics of basic igneous rocks in
the U.S.S.R. Zap. Vses. min. ob-va 94 no.6:625-641 '65.
(MIRA 18:12)

1. Deystvitel'nyy chlen Vsesoyuznogo mineralogicheskogo
obshchestva.

VELIKOSLAVINSKIY, D.A.; YELISEYEV, N.A.; MIKHAYLOV, D.A.; SOLOV'YEV, S.P.

Sergei Vladimirovich Obruchev, 1891-1965; obituary. Zap.
Vass. min. ob-va 94 no.6:735-736 '65. (MIRA 18:12)

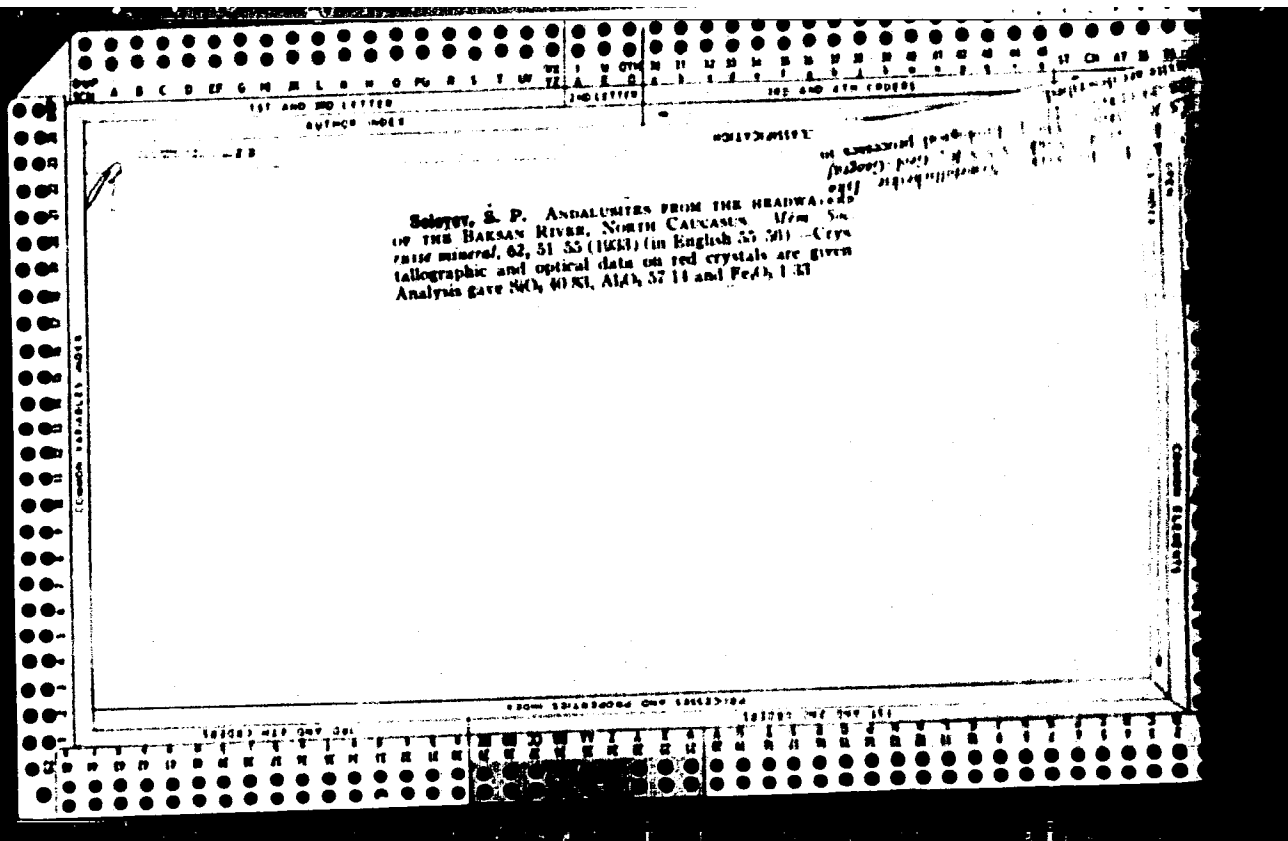
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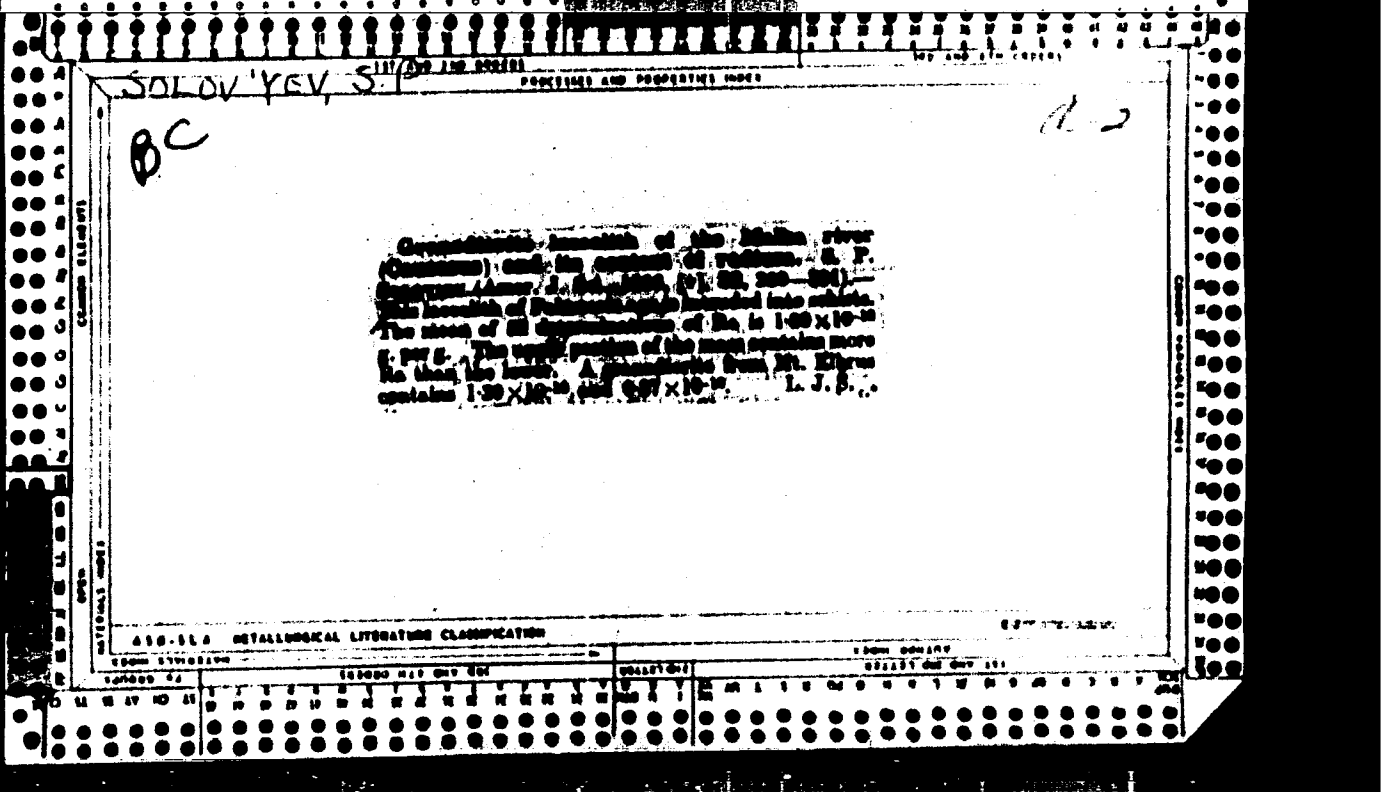
3

Petrologic study of Malka River granodiorite laccolith (in Northern Caucasus) in connection with its radium content. S. P. Andryev. *Trav. inst. Nat. radium* (U. S. S. R.) 7, 221-237 (in English 244-5) (1933). — Fifty-two rock samples from different parts of the granodiorite body near Malka River (40 km. south of Kislovodsk) were tested for Ra. Chem. analysis of the rock gives: SiO₂ 68.10-74.40, TiO₂ 0.12-0.31, Al₂O₃ 12.91-15.83, FeO 0.50-0.89, Fe₂O₃ 1.66-2.06, MgO 0.29-0.95, CaO 0.66-2.01, MnO 0.16-0.50, Na₂O 4.15-5.46, K₂O 2.26-5.01, P₂O₅ 0.16-0.19, P₂O₃ 0.03-0.40 and H₂O 0.26-0.30%. Geological explanation showed that this rock presents a laccolith with its center of eruption lying in the region of the head parts of Garshilid and Tegalid right tributaries of Malka River. The base of the laccolith consists of metamorphic schists. Petrographic and chem. exams. indicates that the rock belongs to the granodiorite type. A greater concn. of Ra in the roof of the laccolith (about 150 m. thick) than in other parts is observed. Three groups of minerals are distinguished: biotite, muscovite and kucucratite, with Ra contents of $>2 \times 10^{-10}$, $1.0 - 2.0 \times 10^{-10}$ and $<1.0 \times 10^{-10}$ %, resp. Zr was found in 42 samples.

S. L. Mubeshy

U.S. DEPARTMENT OF COMMERCE METALLURGICAL LITERATURE CLASSIFICATION

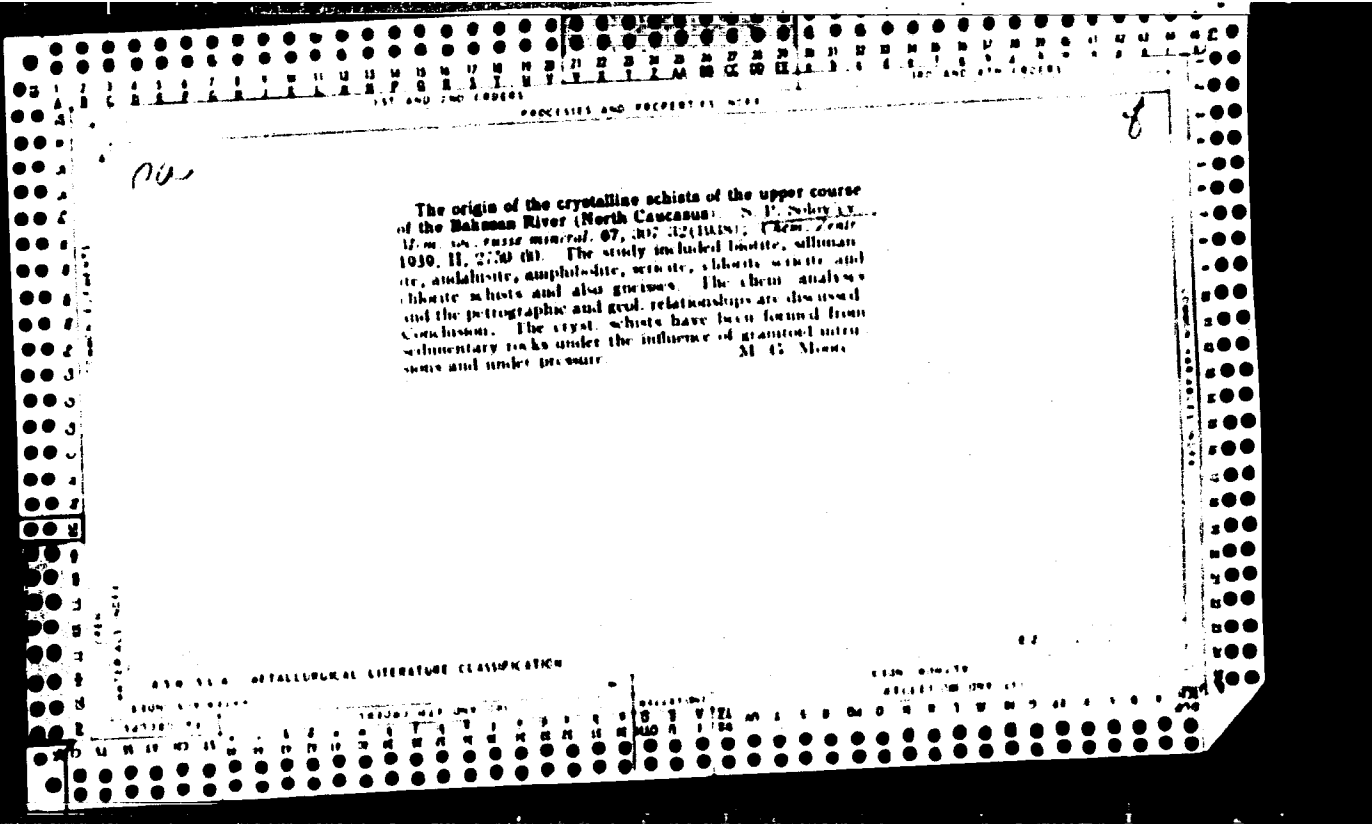


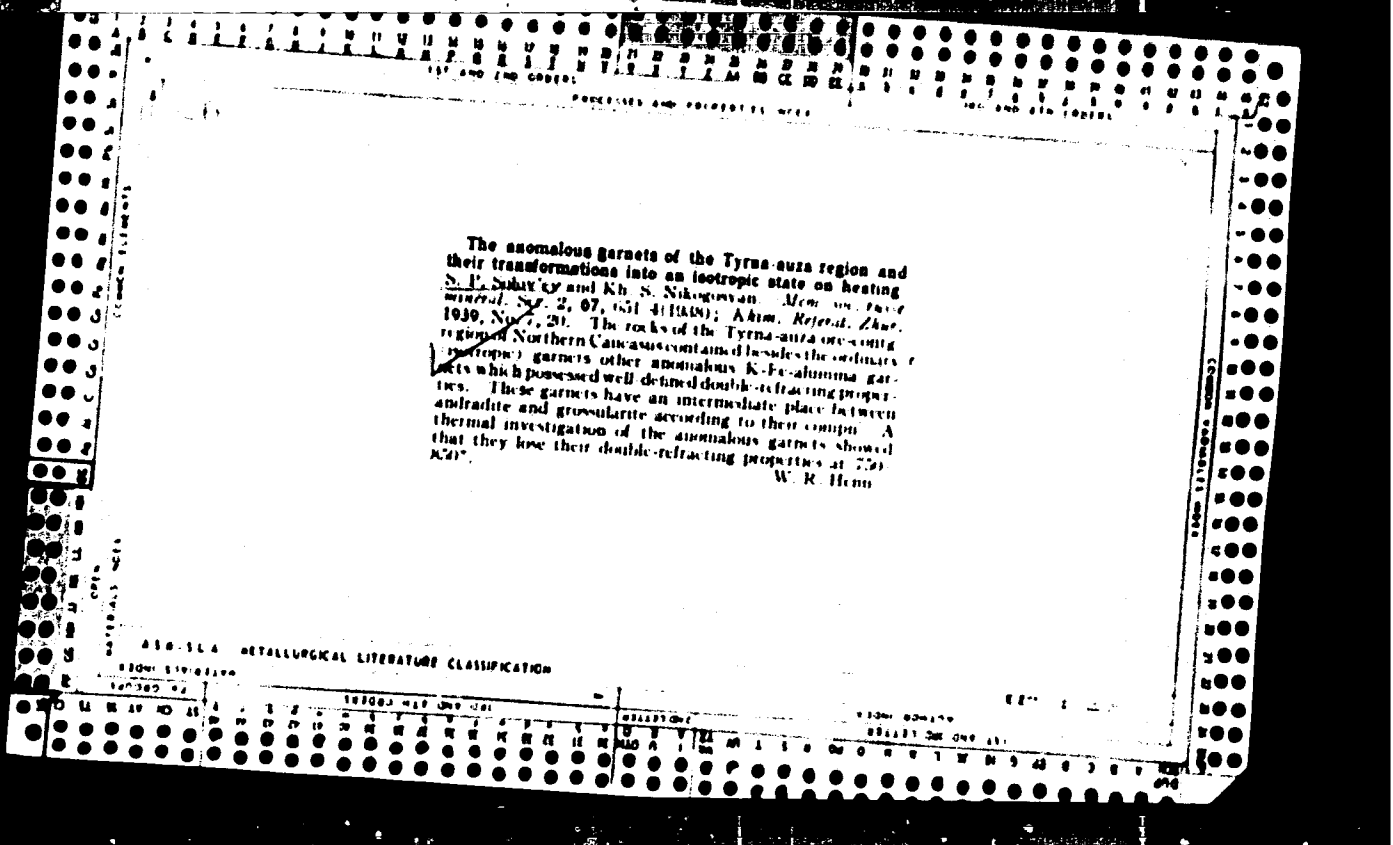


ca *8*

The different types of mica. S. P. Sakov'ev. *Petrografiya S. S. S. R. Ser. 3, Poreodoobrazuyushchii Mineraly* 1966, No. 1, 110; *Khim. Referat. Zhur.* 1, No. 10, 32 (1966).—Chem. compos. of mica, some data of their general compos., classification, optical and other properties, artificial prepn. and genesis are given. The compos. and the properties of the following types of mica are given: clay mica (muscovites), Li mica (lepidolites), Fe-Mg mica (biotites) and hydro-mica (contg. zeolite water). Chem. analysis and optical properties of the different types of mica are given. W. R. Henn

AND U.S. PATENT OFFICE LITERATURE CLASSIFICATION

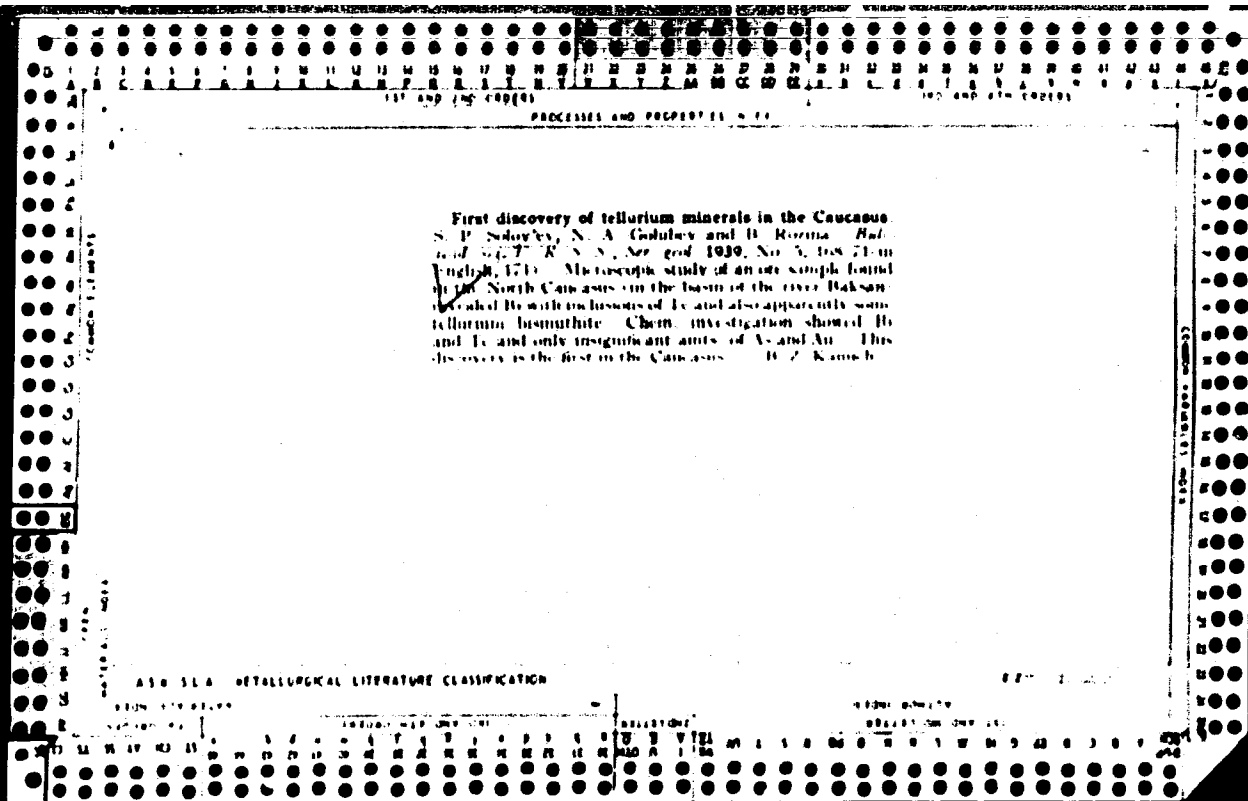




The anomalous garnets of the Tyrna-ezza region and their transformations into an isotropic state on heating S. P. Dzhur'ya and Kh. S. Nikogosyan. *Mem. on the mineral. Ser. 2, 67, 651-4 (1949); Akim. Rejeval. Zhur. 1939, No. 7, 20.* The rocks of the Tyrna-ezza ore-bearing region of Northern Caucasus contain besides the ordinary (isotropic) garnets other anomalous K-Fe-alumina garnets which possessed well defined double-refracting properties. These garnets have an intermediate place between andradite and grossularite according to their composition. A thermal investigation of the anomalous garnets showed that they lose their double-refracting properties at 750°C.

W. R. Henn

A 50-514 METALLURGICAL LITERATURE CLASSIFICATION



A.C.S

Geology
JH

Alkali feldspars of the ancient and recent intrusions of Kabardino-Balkaria and some problems connected with them. S. F. Sidorov. *Trudy Vostochnogo Mineral. Obshchestva*, 66 [2-3] 205-16 (1960); *Khim. Neft. Zhur.*, 6 [6] 28 (1961).—The alkali feldspar intrusions of this region, varying in the time and depth of their solidification, differ from each other optically. The feldspars of the earlier intrusions, solidified at a greater depth, have a very large $2V$ (often exceeding 90°), a clear triclinic character, and a clear microcline lattice, i.e., they are microclines (microcline parthite). The feldspars of the recent porphyritic granites have a moderate $2V$ (approximately 70°) and pseudomonoclinic optical orientation and belong to the potassium anorthoclases. The recent extruded rocks of the diorite-gabbro variety have a $2V$ approximately 30° and belong to anorthoclase or potassium anorthoclase. A chemical investigation of the feldspars indicates the predominance of the potassium molecule also in anorthoclase. X-ray diagrams show the similarity of their crystalline structure and very small differences in the intensity of the lines of a Debye diagram. M. Ho.

AC

A-I-2

Optical sensitisation of silver halides. II. Absorption spectra of dyes and sensitisation spectra of silver halides. S. Salevick (Acta Physicochim. U. R. S. S., 1944, 19, 592-601; cf. B., 1945, II, 189). Absorption spectra of a no. of cyanine dyes have been determined and compared with sensitisation spectra of AgBr. Three different states for the dyes are indicated; (i) a mol. state, in solution in non-polar solvents or in low concn. in H₂O, (ii) a polymeric state, in higher concn. in H₂O or in presence of lyophilic colloids, with lower max. extinction than in (i), (iii) an aggregated state, in solutions containing electrolytes or lyophilic colloids or when adsorbed on glass or on AgBr, with still lower extinction. The absorption spectra corresponding to the three states are distinct from each other, with one absorption band in (i), which is found also in (iii) and in the sensitisation spectrum of AgBr. State (ii) shows a new band in the shorter-λ region and state (iii) shows a further band which is the main band in the sensitisation spectrum. L. J. J.

ASAC 55.6 METALLURGICAL LITERATURE CLASSIFICATION

Mean composition of magmatic complexes in different geological ages. S. P. Sukhlyakov. Doklady Akad. Nauk S.S.S.R. 50, 17: 877-881. The problem of the time factor in magmatic processes is important for metal mineralization. Its study is based on a series of the average composition of rocks in different geol. "provinces" and ages. Numerical data are discussed (in wt. %) for the Alpine province of the Caucasus, the Far East ranges, and the Paleozoic folded province of the Ural. Both groups are compared with the Pre-Cambrian rocks of the Kola Peninsula (partly including Khibiny), and the old complexes of Ukraine. The Alpine rocks are markedly higher in SiO₂ than the Paleozoic rocks of the Ural. All these groups have particular chem. characteristics: the Pre-Cambrian are highest in SiO₂, the Paleozoic complexes highest in bases. The time factor in the chemistry of the magmatic plutons is marked, and there is no question of a uniformity of the magmatism through the geol. ages, as many authors assumed. The performance of basic eruptives is a characteristic mark of the Paleozoic era. W. Eitel

SOLOV'YEV, S.P.

Petrographic legacy of V.N. Lodochnikov. Mat. VSECHI Ob. ser. no.8:
136-139 '48. (MIRA 11:4)
(Petrology) (Lodochnikov, Vladimir Nikitovich, 1887-1942)

SOLOV'YEV, S.P.

Characteristics of skarns of the southern Maritime Territory (Far
East). Mat. VNECHNI Ob. ser. no.8:113-118 '48. (MIRA 11:4)
(Maritime Territory--Skarns)

SOLOV'YEV, S. P.

USSR/Academy of Sciences
Minerals

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Apr/May/June 48

"Report on the Activity of the All-Union Mineralogical Society in 1947," S. P. Solov'yev, Acting Mem, Secy, All-Union Mineralogical Soc, 4 pp

"Zapiski V-S Mineral Obshch" Vol LXXVII, No 2

Gives deaths and new members of society, chronological account of scientific and research efforts of society, names of authors with articles they published, notice of reorganization of All-Russian Mineralogical Society with transfer of its records to jurisdiction of Academy of Sciences.

1/ACR2

Regional distribution and chemistry of magmatic rocks in Sikhote-Alin, Far-East, U.S.S.R. S. P. Sukor'ev. *Zapiski Vostochn. Mineral. Obshchestva* (New ser. Russ. Mineral.) 78, 187-91 (1949).—For the regional distribution of the eruptive rocks in Sikhote-Alin the predominance of acidic intrusives in the Paleozoic and lower Jurassic period, and the low amt. of ultrabasic and characteristic, while in the younger upper Cretaceous and Tertiary effusives, acidic and basaltic rocks are of equal importance. Feldspathoids are very subordinate; only some granitoid intrusives are observed with augite, and nepheline basalts are only known from the basin of River Imana. Pegmatite veins are abundant in the older intrusives, while in the younger intrusives of the eastern Sikhote-Alin they are almost completely absent. Hybrid rocks of higher levels of assimilation are observed in the younger intrusives, but an "abyssic assimilation" is most doubtful. Microcline is the typical feldspar of the older intrusives; the plagioclase is acidic oligoclase in the granitoids, feldspar richer in CaO is in the younger rock types. Dark mica is predominant in the older biotite in the younger rocks. Monoclinic pyroxene, needle-shaped amphibole, garnet, and epidote are typical melanocratic minerals of the younger rock types. Though the older intrusives generally are more acidic than the younger, the latter often contain twice as much FeO and MgO; the K₂O content is higher in the older intrusives. Particularly interesting is the relatively high amt. of P₂O₅ in the young intrusives. In the hydrothermal phase of the magmatism, hardly any enrichment of low-temp.

metals was observed in the older intrusives, but H, Hg, and Sb ores are typical low-temp. elements in the younger mineralization. Datolite, axinite, diaspore, and cuspidine are only observed here. On the other hand, uillmannite is formed exclusively in the older metamorphic schists of western Sikhote-Alin, and south-western Primor. The younger intrusives are accompanied by skarns with Mn-enriched beryliferite. The metamorphism of the older intrusives bears the features of deeper levels than that of the younger group. The regional distribution of the acidic and basic intrusive rocks of the Sikhote-Alin is analogous in as much the ratio of their areas is about 1:1, while generally in the realm of the U.S.S.R. it is 1:5. The Tertiary and Quaternary extinguished volcanism of the Far East has the character of central effusions, but many of them are arranged in one line with some Manchurian volcanoes. A great analogy exists, too, with the volcanism of Kamchatka, and of the Kuril Is. The chemical and mineralogical character of their lavas shows a typical transition from monoclinic pyroxene-amphibole phenocrysts to those of biotite, from labradorite to andesine, and andesine-oligoclase, with quartz and K-Na feldspar only in the youngest effusives, i.e. the general trend to a "rejuvenation" is evident. The analogy extends even to the corresponding effusives of western U.S.A. Hydrothermal-metasomatic changes of the effusives brought about some ore and nonore mineralizations, among which an illite is very remarkable. W. Estel

C. A.

Acidic effusives, and ignimbrites from the S. Sakho-Alin; petrochemical characters. S. P. Solov'ev. *Zapiski Vostochno-Sibirskogo Nauchno-Issledovatel'skogo Instituta* 70, 211-22 (1950). - The huge area of Sakho-Alin which is occupied by several 100-m. thick beds of effusives and pyroclastic tuffs (ignimbrites) includes quartziferous felsite, diorite, microgranitic liparite, porphyries, granophyres, vitrophyres, nevolites, kryptoporphyrates, dolerites (quartz-lattites), dacites and diorite porphyries, and partly alkaliized porphyries as the type rocks. Post-magmatic hydrothermal metamorphic products and occasional more basic dikes are localized. The geol. problem of the differentiation of the older (porphyric) to the young (laccolite) rock types is very complex; the indications speak more for a discontinuous than for regular gradational transitions of the rock character. The absence of quartz and K-Na-feldspate in the lower (older) types, and the remarkable reduction of the Fe content in the plagioclase of the upper effusive rocks, are, however, important indications, which speak for an effusion not from one or a few centers, but from a greater no. of volcanic fissures. Analytical material (6 new analyses of type rocks are given) is compared with a series of type analyses for the Far East, and Circum Pacific. Characteristic for the Sakho-Alin acidic liparite magma is the sum with Al₂O₃, the difference between Al₂O₃ and the sum of the alkalis is considerably higher than CaO. The MgO is also low. W. F. Fitch

SOLOV'YEV, S. P.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

<u>Name</u>	<u>Title of Work</u>	<u>Nominated by</u>
Solov'yev, S.P.	"Distribution of Magmatic Rocks in the USSR and Certain Problems of Petro- logy"	Leningrad Mining Institute

SO: W-30604, 7 July 1954

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Иркутск, Иркутск

Распределение и распространение во время периода аллювиальных (и ультрааллювиальных)
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SOLOV'YEV, S.P.

Problem of succession in the formation of minerals in skarns. (In:
Akademiia nauk SSSR. Voprosy petrografii i mineralogii. Moskva,
1953. Vol. 1, p.206-214)
(MLRA 7:4)
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NIKOLAYEV, V.A., deystvitel'nyy chlen; SOLOV'YEV, S.P., deystvitel'nyy chlen.

Works of A.N. Zavaritskii in the field of petrography. Zap.Vses.min.ob-
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1. Vsesoiuznoye Mineralogicheskoye obshchestvo. (Mineralogy--Societies)

PAFFENGOL'TS, K.N., deystvitel'nyy chlen; SOLOV'YEV, S.P., deystvitel'nyy chlen.

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(Gerasimov, Aleksandr Pavlovich, 1869-1942)

SOLOV'YEV, S.P.

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SOLOV'YEV, S.P.

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VITOSHINSKAYA, M.I., bibliograf; GAKKER, I.F., bibliograf; SHNEYDER, R.A., bibliograf; SOLOV'YEV, S.P., doktor geologicheskikh nauk, redaktor; KULIKOV, M.V., kandidat biologicheskikh nauk, redaktor; PERLIN, S.S., redaktor izdatel'stva; GUROVA, O.A., tekhnicheskii redaktor

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