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YUGOSLAVIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research

C-2

Abs Jour : Ref Zhur - Fizika, No 2, 1959, No 2599

Author : Paic M., Prelec K., Tomas P., Varicak M., Vosicki B.

Inst : -

Title : Cockroft and Walton Accelerator for 200 kb Used to Generate
Neutrons.

Orig Pub : Glasnik mat.-fiz. i astron., 1957, 12, No 4, 269-289

Abstract : No abstract

Card : 1/1

YUGOSLAVIA/Electronics - Photocells and Semiconductor Device.

H

Abs Jour : Ref Zaur Fizika, No 12, 1959, 27927

Author : Varicak, Milena

Inst : Instituto Rudjer Boskovic, Zagreb, Yugoslavia

Title : Investigation of Characteristics of Miniature Thermis-
tors and Their Application in Vacuum Technology

Orig Pub : Tehnika, 1958, 13, No 10, Elektrotehnika, 7, No 10,
169-171

Abstract : An investigation of the possibility of employing
miniature thermal resistances for the measurement
of pressures less than 10^{-3} mm mercury has led to
the development of a monometer suitable for chang-
ing pressures within the limits $1 - 10^{-6}$ mm mercury.

Card 1/1

URLI, N.; VARICAK, M.

The Peltier effect in semiconductors. Vës mat fiz Srb no.12:91-95
'60.

1. Fizicki institut Prirodoslovno-matematickog fakulteta
i Institut "Ruder Boskovic," Zagreb).

BOSANCIC, M.; COCKOVIC, H.; VARICAK, M.

Measuring the specific heat of solids in the dependency of temperatures. Obz mat fiz 7 no.2:82-87 '60. (EEAI 9:12)

1. Fizicki institut Prirodoslovno-matematickog fakulteta u Zagrebu.

(Specific heat)
(Calorimeters and calorimetry)
(Solids)

44302

S/058/62/000/012/038/048
A062/A101

247700

AUTHORS: Saftić, B., Varicák, M., Zuppa, M.

TITLE: Effect of monoenergetic 14.2 Mev neutron irradiation on the conductivity of germanium

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1962, 66,
abstract 12E471 ("Glasnik mat.-fiz. i astron.", 1961,
16, no. 1 - 2, 121 - 123, English; summary in Serbo-Croatian)

TEXT: The conductivity variations of n-Ge irradiated by a flux of 14.2 MeV neutrons was investigated. The initial conductivity of the specimens was $0.2837 \text{ ohm}^{-1}\text{-cm}^{-1}$. In order to reduce the effect of the temperature variations of the surrounding medium, the specimens were placed in a thermostat (temperature $30 \pm 0.05^\circ\text{C}$). The conductivity variation of the specimens after 15 hour-irradiation by a flux of 5.10^8 neutron/sec was as low as $\sim 0.75\%$. In the specimens which were not placed in the thermostat even that small variation was not noticed. The rate of removal of the carriers was determined as equal to 25 carriers per neutron. A possibility was obtained to detect the dependence previously assumed (RZh Fiz, 1960, no. 9, 23850) of the carrier removal rate on the initial carrier
Card 1/2

Effect of monoenergetic 14.2 Mev neutron irradiation.. S/058/62/000/012/038/048
A062/A101

concentration, and also to determine the energetic levels of the radiation de-
fects caused by the 14.2 Mev V neutron irradiation of Ge.

G. V.

[Abstracter's note: Complete translation]

+

Card 2/2

SAFTIC, B. (Zagreb); VARICAK, M. (Zagreb); ZUPPA, M. (Zagreb)

Effect of monoenergetic 14,2 MeV neutron irradiation on the conductivity of germanium. Glas mat fiz Hrv 16 no.1/2:121-123 '61.

1. Faculty of Sciences and Institute "Ruder Boskovic", Zagreb.

L 04134-67 T IJP(c) GG/AT

ACC NR: AP6020777

SOURCE CODE: YU/0020/65/000/05-/0015/0020

AUTHOR: Varicak, Milena (Doctor; Professor; Scientific associate)

46
B

ORG: "Rudjer Boskovic" Institute, Zagreb (Institut "Rudjer Boskovic")

TITLE: Effects of nuclear radiations on the properties of semiconductors

SOURCE: Nuklearna energija, no. 5-6, 1965, 15-20

TOPIC TAGS: radiation effect, semiconductor research

ABSTRACT: Electric properties of semiconductors are particularly sensitive to radiations and thus this problem has been given particular attention. For a better understanding, a brief review is presented of the main characteristics of semiconductors, as well as of the defects induced by irradiation in the solid state. The article presents major results obtained in recent decades in this field by various scientific establishments mainly abroad and in Yugoslavia. Orig. art. has: 15 formulas and 4 figures.

SUB CODE: 18,20/ SUBM DATE: none/ OTH REF: 012/ SOV REF: 001

Card 1/1 *llh*

VARIČAK, T.; FRANK, A.

Structure of the liver in aquatic mammals in relation to the general structure of a liver. p. 101 (GLASNIK, Series II/3, v. 4/6, 1950/52, Zagreb, Yugoslavia)

SO: Monthly List of East European Accessions, (EEL), LC, Vol. 4, no. 1
Jan. 1955, Uncl.

VARIGAK, Teodor; RODE, Bojan; FRANK, Albert

Histochemical studies of mastocytes in the uterus of some ruminants. Biol glas 15 no.1:39-41 '62.

1. Glavni urednik, "Bioloski glasnik. Periodicum biologorum".

RODE, B.; FRANK, A.; VARICAK, T.

The distribution of acid and alkaline phosphatase activities in some organs of *Cyprinus carpio* L. Bul sc Yug 9 no.6:158-159 D '64.

1. Department of Anatomy, Histology, and Embryology of the Veterinary Faculty, Zagreb. Submitted August 3, 1964.

VARICEVA, V.: UZUM, V.

"Arrangement of vineyards on inclined land"

Per Bujqesine Socialiste. Tirane, Albania. Vol. 13, no. 1, Jan 1959

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 6, Jun 59, Unclas

PETROV, K.A.; NEYMYSHEVA, A.A.; DOTSEV, G.V.; VARICH, A.G.

Reactions of sulfenyl chlorides and N-chloramines with phosphorus trichloride, dichlorophosphines, and red phosphorus. Zhur. ob. khim. 31 no.4:1366-1371 Ap '61. (MIRA 14:4)
(Chloramine) (Sulfenyl chloride)
(Phosphorus organic compounds)

VARICH, A.K.

Introduce more rapidly the new system for repairing building machines.
Transp.stroi. 9 no.6:36-37 Je '59. (MIRA 12:11)

1. Glavnyy mekhanik mekhaniziroyannoy kolonny No.36 tresta Sredazstroy-
mekhanizatsiya.
(Building machinery--Maintenance and repair)

VARICH, M.

Developing automatic control systems. Gor. zhur. no.7:57 J1
'61. (MIRA 15:2)

1. Zamestitel' nachal'nika Upravleniya po avtomatizatsii i
oborudovaniyu dlya ugol'noy i gornodobyvayushchey promyshlennosti
Gosudarstvennogo komiteta Soveta Ministrov SSSR po avtomatizatsii
i mashinostroyeniyu.

(Mining engineering)
(Automatic control)

VARICH, M.S., gornyy inzh.-elektrotekhnik

Basic trends in the development of equipment for mining and
dressing ores. Gor. zhur. no.2:3-9 F'62. (MIRA 17:2)

1. Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii
i mashinostroyeniyu.

MELESHKIN, S.M.; YARICH, M.S.; BEZLYUD'KO, A.I.; SOROKIN, Ye.A.;
Yagupov, A.V.

Flame-throwing drill for drilling blastholes in pits.
Bul.tekh.-ekon.inform. no.2:4-6 '60. (MIRA 13:6)
(Boring machinery)

YAGUPOV, Aleksandr Vasil'yevich; POKROVSKIY, Mikhail Aleksandrovich;
VASIL'YEV, Anatoliy Pavlovich; VARICH, Mikhail Sidorovich;
LYUBIMOV, N.G., otv. red.; OVSEYENKO, V.G., tekh. red.

[Jet piercing of blast holes] Ognevoe burenie vzryvnykh skvazhin.
[By] A.V. Iagupov, i dr. Moskva, Gosgortekhnizdat, 1962. 199 p.
(MIRA 15:7)

(Boring)

VARIKH, N. I.; SEMKA, A.

Completing construction by the method of combined technology. Avt.
dor. 23 no. 4:16-17 Ap '60. (MIRA 13:6)
(Road construction)

18(4), 18(6)

AUTHOR: Varich, N. I.

SOV/163-59-1-36/50

TITLE: Influence of Lithium, Zinc, and Magnesium Upon the State of the Crystal Lattice of Aluminum (Vliyaniye litiya, tsinka i magniya na sostoyaniye kristallicheskoy rešetki alyuminiya)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1959, Nr 1, pp 182-188 (USSR)

ABSTRACT: This is an investigation of the influence of alloying elements upon the state of the crystal lattice of aluminum. For this purpose the alloy was investigated in its original state, in which the atoms of the alloying element are homogeneously distributed in the solid solution. The experiments were carried out at room and at elevated temperatures with pure AV000 aluminum and with binary alloys of aluminum. The experiments showed that the introduction of lithium and zinc into aluminum (to a limit of 2%) leads to a weakening of the interatomic bonds. At elevated temperatures the lattice dimensions of the solid solutions of zinc increase less than those of lithium solutions. This can to a certain extent be explained by a gradual transition of the lithium ions into the atomic state at elevated temperatures. This explanation can be offered if reasoning is conducted

Card 1/2

Influence of Lithium, Zinc, and Magnesium Upon the
State of the Crystal Lattice of Aluminum

SOV/163-59-1-36/50

according to the viewpoint of Zamotorin (Ref 7). The experiments showed that the presence of considerable dynamic distortions in the crystal lattice of the same Al-Li alloys does not lead to an increase in strength. So do only static distortions of the alloy lattice. An increased stability of the lattice of Al-Mg alloys at elevated temperatures was found in the course of the experiments. This is explained by the strengthening of the interatomic bonds. Apart from the factors enumerated in the papers (Refs 3, 5, and 9) the increase of the linkage forces represents the main cause for the increase of the recrystallization temperature and of the energy required for the acceleration of the diffusion of magnesium in solid Al-Mg solutions. There are 4 figures and 9 references, 8 of which are Soviet.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University)

SUBMITTED: March 25, 1958
Card 2/2

ABSTRACT The choice of the composition of oxidation resistant Al-Mn alloys is

Card 1/2

the most appreciable effect between and via greatly enhanced appreciation

Card 2 of 4

VARICH, N. I.

PAPER I BOOK CRYSTALLIZATION 507/5344

Специальная по теории кристаллизации профессора, А.В. Кристаллизация металлов; теория кристаллизации (Кристаллизация металлов) Доклады на Четвертой конференции по теории кристаллизации металлов, 1960, М. М. ИСЭИ, 1960. 325 с. 3,000 копий отпечатано. Спонсор: Агента Академия наук СССР. Институт металлургии. Кристаллы по микроструктурной металлографии.

Крым, Е. I. B. B. Olyuyev, Doctor of Technical Science, Professor, Ed. of Publishing House: V. S. Babitskiy, Mos. Ed.: S. O. Babitskiy. PAPER: This book is intended for metallurgists and scientific workers. It may also be useful to technical personnel at foundries.

CONTENTS: The book contains the transactions of the Fourth Conference (1960) on the Theory of Casting Processes. (The previous 3 conferences were held in 1957, 1958, and 1959) solidification problems in the crystallization processes in castings (1957), the problems of construction of castings, the problems of casting, including the crystallization of constructional steels, alloy steels with special properties, cast iron, and of nonferrous alloys, are discussed. Mention is given to D. K. Chernov and N. T. Chelner and their students, A. B. Olyuyev and A. O. Spasskiy, for their contributions to the understanding of the basic problems involved in the theory of crystallization of ferrous and nonferrous metals and alloys. Academician A. V. Shubnikov is also mentioned in connection with his work on the plasticity of ferrous metal during crystallization. Numerous references are given to the literature.

III. CRYSTALLIZATION OF SPECIAL-PROPERTY STEELS AND ALLOYS

Богданов, И. И. Influence of heat-treatment on the structure and physical-mechanical properties of high-alloy steels 158
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Спасский, А. А. Characteristic features of microscopic crystallization of alloys 318
CRYSTALLIZATION OF SPECIAL-PROPERTY STEELS AND ALLOYS

VARICH, N.I.; KOLYSHNICHENKO, K.Ye.

Effect of a high speed of cooling on the structure and properties of
aluminum alloys. Izv. vys. ucheb. zav.; tsvet. met. 3 no.4:131-136
'60. (MIRA 13:9)

1. Dnepropetrovskiy Gosudarstvennyy universitet. Kafedra metallofiziki.
(Aluminum alloys)

VARICH, N.I.

82443

S/149/60/000/004/006/009

18.1210

AUTHORS: Varich, N.I., Kolesnichenko, K.Ye.

TITLE: The Effect of High-Speed Cooling on the Structure and Properties of Aluminum Alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1960, No. 4, pp. 131-136

TEXT: V.I. Danilova and M.A. Levashevich (Ref. 1), Hofmann and Falkenhagen (Ref. 2) and Hahnemann and Schrade (Ref. 3) studied the effect of high-speed cooling on the strength of Al-base alloys. The authors investigated this effect on the structure and properties of binary Al-Cr and Al-Mn alloys. A crystallization rate of 50,000 degrees/sec was attained by catapulting the liquid melt (at 900°C) on a cold copper support. The crystallization rate was determined by an oscillograph. High-speed cooling makes it possible to obtain a number of solid Al-base solutions from the liquid state with a wider concentration range of some components than provided by the structural phase diagram. At a cooling rate of 50,000 degrees/sec the chromium content in the solid solution attains 5.7 weight %. At the same rate the maximum amount of manganese in the solid solution exceeds 10 weight %. High-speed cooled alloys, prepared in the form of thin plates, were tested on a special device built at the University laboratory. It was established that Al-base alloys
Card 1/2

82443

s/149/60/000/004/006/009

The Effect of High-Speed Cooling on the Structure and Properties of Aluminum Alloys

crystallizing during high-speed cooling acquired a high ultimate strength without any considerable loss in their ductility. The ultimate strength of an Al-alloy with 5.7% Cr was as high as 60 kg/mm². The phase composition of the alloys was investigated using the method of determining the paramagnetic susceptibility (described in Reference 4 by F.S. Smirnov). It was found that a homogeneous solid solution was formed in Al-Mn alloys containing 5% Mn. If the Mn content increased up to 10%, a low amount of a metastable Al₄Mn phase was revealed. In Al-Cr alloys a homogeneous solid solution was formed at a Cr content up to 1.8%. A further increase in the Cr content entailed the formation of a metastable Al₄Cr phase and the solid solution was supersaturated up to 5.7% Cr. The Al-base solid solution, oversaturated with Cr, began to disintegrate within a range of 450-550°C (depending on the Cr content). A solid solution saturated to the limit point underwent a two-phase disintegration. There are 5 graphs and 4 references: 2 Soviet and 2 German.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University) Kafedra metallofiziki (Department of the Physics of Metals)

SUBMITTED: March 19, 1960

Card 2/2

80889

S/126/60/009/06/016/025

E073/E335

18.1210

AUTHORS: Varich, N.I., Belousov, N.N. and Shcherbakov, G.I.

TITLE: Influence of Plastic Deformation on the Structure and Properties of an Al-Mg Alloy

PERIODICAL: Fizika metallov i metallovdeniye, 1960, Vol 9, Nr 6, pp 909 - 917 (USSR)

ABSTRACT: The aim of the work described in this paper was to investigate the influence of plastic deformation of cast and hot-pressed specimens on the changes in the mechanical properties and in the sub-microstructure of a new alloy AL8-U containing 11.5% Mg, 0.14% Be, 0.1% Ti, 0.1% Zr, rest Grade AV000 aluminium. Ingots of this alloy were produced in a 120 mm dia metal mould, applying by means of a piston a specific pressure of 1300 kg/cm² during the process of crystallisation. The thus-produced ingots were heat-treated (soaked at 435 °C for 20 hours and subsequently quenched in hot water). One batch of the specimens were investigated in the cast and heat-treated state. A part of another batch was subjected to cold-working to the extent of 25, 50 and 75%; a second part of this batch was subjected to hot pressing at 420 °C

Card1/3

80888

S/126/60/009/06/016/025

E073/E335

Influence of Plastic Deformation on the Structure and Properties of an Al-Mg Alloy

and some of these specimens of the pressed and heat-treated alloy were also subjected to subsequent cold-working to the extent of 25 and 50%. The results of testing the mechanical properties of specimens after various types of deformation are given in Table 1. The average results of the mechanical tests (at -60, +20, +150 and +200 °C) of hot-pressed specimens are entered in Table 2. Results of hardness tests of type-II stresses of the dependence of the block dimensions on the degree of deformation and other results are entered in graphs. The results of extensive tests have shown that this new Al-Mg alloy containing 11% Mg and very small additions of Be, Zr and Ti is suitable for producing semis by hot pressing. Components from this new alloy can be manufactured directly from hot-pressed rods and also from cold-worked material. The alloy AL8-U was originally proposed by N.N. Belousov, A.A. Dodonov, V.A. Yegorov, A.A. Ivankin and Ye.N. Mikheyev.

Card 2/3

80888

S/126/60/009/06/016/025

Influence of Plastic Deformation on the Structure and Properties
of an Al-Mg Alloy

EO73/E335

There are 9 figures, 3 tables and 4 references,
2 of which are German and 2 Soviet.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet
(Dnepropetrovsk State University)

SUBMITTED: October 10, 1959

Card 3/3

ACCESSION NR: AT4017178

S/0000/63/000/000/0234/0243

AUTHOR: Belousov, N. N. (Leningrad-Dnepropetrovsk); Varich, N. I. (Leningrad-Dnepropetrovsk); Shcherbakov, G. I. (Leningrad-Dnepropetrovsk)

TITLE: Investigation of the influence of the thermal conditions of hardening of castings under plunger pressure on the submicrostructure of aluminum

SOURCE: AN BSSR. Fiz.-tekhn. Institut. Teplofizika v liteynom proizvodstve (Thermal physics in the foundry industry). Minsk, 1963, 234-243

TOPIC TAGS: plunger pressure, roentgenography, aluminum structure, high melting element, aluminum alloy, crystal structure, cast hardening

ABSTRACT: Deep shrinkage cavities, porosity, and heterogeneity are often observed in large-size aluminum castings. The present investigation considered the influence of small additions of some elements on the properties, structure, and submicrostructure of grade AL8 alloy crystalized under atmospheric pressure and a plunger pressure of 4,000 kg/sq cm. Roentgenographic and metallographic analysis as well as hardness and micro-hardness tests were used in the investigation. It was found that the properties of the alloy improved for pressures up to 2,000 kg/sq. cm. A further increase in pressure did not lead to significant improvement in metal quality. For aluminum alloys containing 10-11% Mg and small additions of

Card 1/3

ACCESSION NR: AT4017178

the high-melting elements Be, Zr, Ti, and Mn, application of plunger pressure during crystallization decreased the differences in the permanent crystal lattice parameters and hardness at the center and edges of the ingot. Orig. art. has: 4 figures and 6 tables.

ASSOCIATION: Fiz.-tekhn. Institut, AN BSSR. (Institute of Physics and Technology, AN BSSR).

SUBMITTED: 19Apr63

DATE ACQ: 06Mar64

ENCL: 01

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

Card 2/3

ACCESSION NR: AT4017179

S/0000/63/000/000/0244/0250

AUTHOR: Varich, N. I. (Dnepropetrovsk); Kolesnichenko, K. Ye. (Dnepropetrovsk)

TITLE: Effect of high crystallization rates on the structure and properties of thin films produced from a melt

SOURCE: AN BSSR. Fiz.-tekhn. institut. Teplofizika v liteynom proizvodstve (Thermal physics in the foundry industry). Minsk, 1963, 244-250

TOPIC TAGS: aluminum manganese alloy, aluminum chromium alloy, aluminum magnesium alloy, alloy film, metal crystallization, alloy film structure, film structure crystallization rate dependence, alloy structure cooling rate dependence, alloy electrical resistance, alloy hardness

ABSTRACT: Al-Mn, Al-Cr and Al-Mg alloys, produced by rapid cooling from a liquid state, were subjected to x-ray, metallographic and electric conductivity studies. The alloys, with up to 11% Mn, 5.7% Cr and 11% Mg, were cooled at a rate of 50,000°/sec by catapulting the liquid melt at 800-890 C onto a cold copper plate; this yielded 0.1-0.3-mm films. Rapid cooling was found to affect the density of the lattice electron cloud and to produce dendritic formations in the microstructure of alloys with up to 1% Mn, while

Card

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ACCESSION NR: AT4017179

alloys with a higher percentage of Mn produced intracrystalline liquation. The microhardness of the films showed a steady and sharp increase up to 9% Mn in the solid solution and a microhardness maximum of 94 kg/mm² was attained for alloys with 5.7% Cr in the super saturated solid solution. A study of the relative paramagnetic susceptibility, used to determine the homogeneity of the solutions, indicated that a homogeneous solid solution, with less than 6% Mn and 2% Cr, crystallizes with a rapid cooling of the Al-Mn and Al-Cr solutions, respectively. In a test with an alloy of Al-Mg (11%), Be (0.12%), Zr (0.17%), and Ti (0.09%), to which 0.42, 0.80 and 1.32% Mn was added, Mn was found to inhibit the diffusion processes in the alloys markedly when its content was approximately 1%. The effect of Mn and heat treatment on the specific electrical resistance and thermal emf of the alloys was also studied and the results discussed. Orig. art. has: 1 figure and 5 graphs.

ASSOCIATION: Fiz.-tekh. institut AN BSSR (Physicotechnical Institute, AN BSSR)

SUBMITTED: 19Apr63

DATE ACQ: 06Mar64

ENCL: 00

SUB CODE: ML

NO REF SOV: 002

OTHER: 001

2/2

Card

VARICH, N.I.; LITVIN, B.N.

Investigating Mg-Mn and Mg-Zr alloys obtained during quenching
from melts. Fiz. met. i metalloved. 16 no.4:526-529 0 '63.
(MIRA 16:12)

1. Dnepropetrovskiy gosudarstvennyy universitet.

BUROV, L.M.; VARICH, N.I.

Thermal expansion of Al-Mn and Al-Cr alloys. Fiz. met. i metalloved.
16 no.4:530-534 0 '63. (MIRA 16:12)

1. Dnepropetrovskiy gosudarstvennyy universitet.

VARICH, N.I.; KRIVUSHA, Yu.V.; LEVINA, R.V.; KOVALENKO, N.D.

Effect of lubricants on the texture of rolled metal. Izv. vys.
ucheb. zav.; chern. met. 6 no.5:151-155 '63. (MIRA 16:7)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Rolling (Metalwork)) (Metalworking lubricants)

S/139/63/000/001/015/027
E202/E592

AUTHORS: Belousov N.N., Varich, N.I., Krivusha Yu.V. and Shcherbakov G.I.

TITLE: Certain structural characteristics and properties of alloys crystallized under piston pressure

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.1, 1963, 92-95

TEXT: The effect of piston pressure on the hardness, lattice parameter and size of the mosaic blocks in the alloys $Al_{80}Mg_{20}$ (AL8U) (11.1% Mg, 0.1% Be and 0.15% Ti and Zr), $Al_{90}Mg_{10}$ (AL2) (9.8% Si and 0.17% Fe), AL9 (7.0% Si, 0.2% Mg and 0.12% Fe), and AL4 (9.3% Si, 0.32% Mg, 0.25% Mn and 0.15% Fe) is discussed. The alloys were crystallized under atmospheric pressure and under piston pressure; the last three ranging from 300 to 6000 kg/cm², and the first one in the pressure range of 1650-9425 kg/cm². Samples were cut out from the ingots radially and the Vickers hardness measured on a sclerosometer type 11 (TP). The X-ray lattice determination was carried out in a camera type KROS-1 (KROS-1) using copper radiation. The dimensions of the mosaic

Card 1/3

Certain structural characteristics ... S/159/63/000/001/015/027
E202/E592

blocks were determined from primary extinction and the intensity of the interference maxima was determined photographically. The dimensions of the blocks were calculated according to G.M.Vorob'yev's method (Izv. AN SSSR, ser.fiz., 23, no.5, 1959) The hardness and lattice parameter were determined also for the transitional zone. In the case of AL3U, the hardness did not change along the edges of the ingot while it increased considerably in the center. With pressures in excess of 3000 kg/cm² the growth of hardness ceased. The experimental data showed that crystallization under piston pressure reduced the dimensions of the coherent scattering regions. Blocks were subdivided most strongly at pressures up to 2500-3000 kg/cm² - further increase of pressure did not affect their dimensions. The increase of pressure reduced the lattice parameter particularly in the center and in the transitional zone, which was ascribed to decrease of the magnesium content in the α -solid solution. The increase of hardness in the center of the ingot was accompanied by subdivision of the mosaic blocks. However, subdivision of the blocks at the edges of the ingot did not affect the hardness. This was due to the effect of the distribution and dimensions of the β -phase particles. In the remaining three alloys

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Certain structural characteristics ... S/158/65/000/001/015/027
E202/E792

the hardness increased continuously with increasing pressure, with the exception of AL9, where the increase ceased in the pressure range of 500-1500 kg/cm². The dimensions of the blocks within the pressure range of 300-2000 kg/cm² substantially decreased. It was not possible to observe the behavior of the former at higher pressures since blocks smaller than 10⁻⁴ cm had no effect on the intensity of the X-ray interference. In AL2, AL9 and AL4 the lattice parameter increased at the low pressure of ~300 kg/cm² and then rapidly decreased at 1000 kg/cm². Higher pressures caused slight increase but in the region of 3000-6000 kg/cm² there was no change in their parameter and its value was substantially the same as for pure aluminium. These phenomena were explained by the general reduction of solubility in solid solutions during increased pressures. There are 5 figures and 2 tables.

ASSOCIATION: Dnepropetrovskiy gosuniversitet imeni 300-letiya
vossoyedineniya Ukrainy s Rossiyey
(Dnepropetrovsk State University imeni 300-years
anniversary of union between the Ukraine and Russia)
October 30, 1961.

SUBMITTED:
Card 3/3

VARICH, N.I.; BUROV, L.M.; KOLESNICHENKO, K.Ye.; MAKSIMENKO, A.P.

Investigating strongly supersaturated Al-V, Al-Mo, and Al-W
solid solutions prepared with high rates of cooling. Fiz. met.
i metalloved. 15 no.2:292-295 F '63. (MIRA 16:4)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Aluminum alloys—Metallography)
(Solutions, Supersaturated—Cooling)

VARICH, N.I., kand.fiz.-matem.nauk

Investigating the texture of cold compression worked iron.
Metalloved.i term.obr.met. no.4:17-20 Ap '62. (MIRA 15:4)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Iron--Metallography) (Deformations (Mechanics))

V. S. ...

temp., the hardness of alloys with 11.2% Ni (annealed) decreased and the hardness of alloys with 8.12% Ni (annealed) increased at 1000°C, then the hardness of alloys with 11.2% Ni decreased or little changed at 1200°C. The hardness of alloys with 8.12% Ni decreased or little changed at 1200°C. The strength and elongation of alloys increased by distortion of the crystal lattice (increased potential energy resulting from an increase of electron density) and the appearance of covalent forces between the Ni atoms. The reason of an increase of hardness of alloys with 8.12% Ni is the distortion of the crystal lattice of the components from their initial positions of equilibrium with the formation of intermetallic compounds. The distortion of the crystal lattice of the components is caused by the deformation of the crystal lattice of the components and the comminution of the crystal lattice of the components. The reason of the increase of hardness of alloys with 11.2% Ni is the distortion of the crystal lattice of the components from their initial positions of equilibrium with the formation of intermetallic compounds. The distortion of the crystal lattice of the components is caused by the deformation of the crystal lattice of the components and the comminution of the crystal lattice of the components. The reason of the increase of hardness of alloys with 8.12% Ni is the distortion of the crystal lattice of the components from their initial positions of equilibrium with the formation of intermetallic compounds. The distortion of the crystal lattice of the components is caused by the deformation of the crystal lattice of the components and the comminution of the crystal lattice of the components.

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VARICHEV, VA.

VARICHEV, V.A., inzhener.

Quick starting of 50 000 kw blocks. Teploenergetika 4 no.10:94
0 '57. (MLRA 10:9)

1. Nesvetay Gosudarstvennaya rayonnaya elektrostantsiya.
(Electric power plants)

YARICHEV, Y.A.

VARICHEV, V.A., inzhener.

Work of metal in radiation steam superheaters. Elef. sta. 23 no. 7:11-14
Jl '57. (MLRA 10:7)

(Superheaters)

AUTHOR: Varichev, V.A., Engineer.

104-2-23/38

TITLE: Operating experience in a power station with the unit
(boiler-turbine) arrangement of equipment. (Iz opyta eks-
pluatatsii elektrostantsii s blochnoy skhemoy komponovki)

PERIODICAL: "Elektricheskie Stantsii" (Power Stations), 1957,
Vol.28, No.2, pp. 81 - 83 (U.S.S.R.)

ABSTRACT: The power station, which commenced operation in 1948, contains four blocks each of one turbine and two boilers with reheat by gas. The AEI two-cylinder 50 MW turbines employ steam conditions of 111 atm. and 475 C, there is a process steam pass out at the fifth stage of 43 atm., 430 C. The three-drum Steinmuller boilers evaporate 100 t/h and have been reconstructed to burn anthracite duff. The other arrangements are described in detail.

The reliability of the equipment is described. There were several emergency stops of the turbine from full load because the thrust blocks were inadequate, the high pressure glands were also unsatisfactory. The emergency stops caused damage to the boilers, particularly to the primary radiation; superheaters and both primary and secondary superheaters were damaged during lighting up of the boilers. The water economisers were damaged by ash wear and some welded joints were of poor

Card 1/3

Operating experience in a power station with the unit (boiler-turbine) arrangement of equipment. (Cont.) 104-2-23/38

quality. In earlier years the annual loss of electric power output because of various defects was 7 - 8% but this has now been reduced to 5%.

The procedure for starting up is described from lighting up of the boilers. When the pressure at the turbine stop valve has reached 55 atm. the turbine is started and it runs up to speed as the boiler pressure rises. The total time required from commencement of firing to connection of the set is 5 - 6 hours and full load is taken up after 7 - 8 hours. However, high speed starting trials have shown that full load can be taken three hours after starting up.

Major overhauls are carried out on an entire set at once and take 570 hours for the two boilers, employing 120 - 200 men. Overhaul of the turbo-generators occupies 36 - 38 men for 540 hours. The utilisation factor of the equipment at the start of operation in 1949 was 70.4% in the boiler house and 55.7 in the machine room. In 1954 the corresponding figures were 86.6% and 86.2%.

It is concluded that the block system is reliable. The combination of radiation and convection superheaters makes it possible to keep the superheat steady with widely varying load.

Card 2/3

Operating experience in a power station with the unit (boiler-turbine) arrangement of equipment. (Cont.) 104-2-23/38

The practice of running up the turbine whilst pressure is building up in the boilers is fully justified. The operation of boilers working in block systems should be made more reliable by preventing slag formation on the heating surfaces and by providing an effective method of cleaning the convective superheaters and using gas flow speed in the tail end of the boiler not greater than 7 - 8 m/sec; the makers should provide protection against wear.
There are 2 figures.

AVAILABLE:

Card 3/3

VARICHEV, V.A.

VARICHEV, V.A., inzh.

Review of L.B.Krol's book "Characteristics of high-pressure
boiler equipment." Elek.sta. 28 no.10:96 '57. (MIRA 10:11)
(Boilers)

VARICHEV, V. A.

AUTHOR: Varichev, V.A., Engineer, Krushel' G.E., Doctor of Technical Sciences and Prokopenko A.G., Engineer.

TITLE: Block starting of 50 MW set with reheat. ^{96-7-1/25} (Blochnyy pusk ustanovki 50 MW s promezhutochnym peregrevom.)

PERIODICAL: "Teploenergetika" (Thermal Power), 1957, Vol.4, No.7, pp. 3 - 11 (U.S.S.R.)

ABSTRACT: At the present time, large, new high pressure power stations are being built on the boiler/turbine block system with reheat. The existing procedure for starting such equipment from the cold consists of a number of successive operations; lighting the boiler, raising pressure, heating pipework, heating and loading the turbine. This could take up to 48 hours and it was necessary to develop new methods of starting up block installations.

A method of simultaneous firing the boiler and starting the turbine for block sets without reheat was developed by two of the present authors. The presence of reheat complicates the procedure because the intermediate superheater must be cooled by steam and only later connected into operation on the turbine already

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Block starting of 50 MW set with reheat. (Cont.)

96-7-1/25

working. In order to avoid damage to the tubes before connecting the reheater into circuit it is usual to cease firing the boiler for a time. Complicated arrangements are required to reconnect the pipework during the operation.

The Nesvetay regional power station was selected for tests on the block starting of sets with reheat and a great deal of work was done there in 1956 to accelerate the starting procedure.

The block consists of a turbo-set of 50 MW operating on steam at 115 atm., 485 C, with reheat to 440 C at 38 atm. using two boilers with an output of 120 t/h, one continually operating turbine driven feed pump and two electrically driven pumps. A schematic circuit diagram is given in Fig. 1.

The original barring gear was not self-disconnecting. It was found that the steam pressure required to accelerate the turbine could be much reduced by increasing the barring speed. A more powerful barring motor was installed and arrangements were made to disconnect it automatically. Steam for starting the auxiliary mechanism was taken from the reheat line of a neighbouring

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Block starting of 50 MW set with reheat. (Cont.)
96-7-1/25

set. A number of thermocouples were installed at various positions in the boilers and turbine and their locations are given in Figs. 2 and 3. Expansion of the turbine cylinders and rotors was measured.

The first block start of the turbine and one boiler was made on February 20, 1957. The preparatory measures are described in detail. Before the start a table of starting conditions (Table 1) was drawn up based on the results of block starts on a turbine BK-100-2. The starting procedure is described and graphs are plotted in Fig. 4 of the changes in steam conditions and consumption, speed, power and expansion of the high pressure cylinder of the turbine as a function of time during this first start. The start was completed in just over 4 1/4 hours. The unusual rate of starting and the absence of data about conditions for heating the turbine made it necessary to run up to speed slowly so that the turbine operated for a long time without load. As was to be expected this caused some overheating (to 140 °C) of the lower pressure sections of the turbine. After the turbine had been loaded up to

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Block starting of 50 MW set with reheat. (Cont.)
96-7-1/25

5-8 MW the temperature of the exhaust steam was reduced to 27 °C which corresponded to the pressure in the condenser. The temperatures of the front walls of the superheater tubes cooled by low pressure steam are given in Fig. 5 and 6. During the entire operation of starting these temperatures were much lower than during normal operation and did not limit the rate of raising pressure. The turbine operated at full load for 6 hours and was then unloaded to 25 MW. One boiler was extinguished and the pressure in the remaining boiler was gradually reduced until after four hours the set was completely unloaded.

On February 22, 1957, after the set had stood for 30 hours a second block start was made with both boilers being lit together and both connected to the turbine from the start. During the first start it was found that in all parts of the steam line the steam temperature was from the beginning above the saturation pressure. Therefore, the second start was made with fully closed drainage cocks on all steam lines which facilitated the application of vacuum and caused no

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Block starting of 50 MW set with reheat. (Cont.)
96-7-1/25

difficulties.

The changes in steam conditions and the general operating conditions of the set during the second block start are plotted in Fig. 7. The start was complete in just over 3 3/4 hours and the general procedure is described. Graphs illustrating the operation of the turbine driven feed pump are given in Fig. 8. Simultaneous firing of two boilers gave rise to no difficulties. Tests results relating to the two starts and the figures relating to heating of the turbines and boilers are given in Table 2, temperature curves for the turbine are given in Fig. 9. There is reason to suppose that in future the time required for a block start can if necessary be reduced to 2 1/2 hours.

It is concluded that the practicability of block starting sets with reheat is fully demonstrated. This method of starting reduces the starting time, reduces the temperature differences and is much more efficient because steam is not exhausted to atmosphere. The boiler firing conditions are governed by the conditions of heating the turbine and, therefore, it is first

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Block starting of 50 MW set with reheat. (Cont.)
96-7-1/25

necessary to investigate the conditions of heating and loading the turbine with reduced steam conditions and to work out the starting conditions from this.

During the start the greatest temperature differences in the metal of the set occur at low temperatures and pressures, which is when the strength of the metal is much higher than the design value. Moreover, the temperature stresses are not then superimposed on mechanical stresses due to steam pressure. Therefore, large temperature differences can be permitted in the early stages of the start. The low thermal stresses in the furnace and the high rate of steam flow prevent overheating of the tubes of the main and intermediate (reheat) radiation superheaters. The set is started by controlling the firing conditions of the boiler and this can easily be made automatic. If block starting is used the station pipework can be much simplified. Therefore, in block sets with drum type boilers which are now under construction it should be possible to do without reduction and cooling installations for starting up, and to do without starting

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Block starting of 50 MW set with reheat. (Cont.)

96-7-1/25

condensers and steam stop valves between the boiler and turbine on the main and reheat steam lines. Other simplifications are also possible.

For regular shut-down of blocks it is advisable gradually to reduce the intensity of combustion in the furnace and so to reduce the steam conditions which automatically unloads the set and effects smooth and rapid cooling.

The defective barring gear on the turbines of the first four blocks of the Nesvetay Power Station should be replaced by self-disconnecting high speed barring gear and steam should be supplied to the auxiliaries from neighbouring blocks. When this has been done block starting should be the normal procedure. The results of the investigations should be used by Teploelektroproekt and the manufacturers of turbines and boilers who should make arrangements for block starting of new sets. There are 9 figures, 2 tables and 1 Slavic reference.

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ASSOCIATION: Nesvetay Regional Power Station (NesvetayGRES)

Block starting of 50 MW set with reheat. (Cont.)
96-7-1/25

L'vov Polytechnical Institute. (L'vovskiy Politekhnicheskiy Institut)

Southern Division of ORGRES. (Yuzhnoe-otdelenie ORGRES)

AVAILABLE:

Card 8/8

LOKSHIN, V.A., kand.tekhn.nauk; MOISEYEV, G.I., inzh.; PAVLENKO, L.I., inzh.;
TALDYKIN, K.M., inzh.; VARICHEV, V.A., inzh.

Thermal conditions during the operation of high-pressure radiation
wall-type superheaters. Elek.sta. 30 no.1:21-26 Ja '59.

(MIRA 12:3)

(Superheaters)

SOV/96-59-10-9/22

AUTHORS: Kuznetsov, N.V. (Dr.Tech.Sci.); Luzhnov, G.I. (Engineer);
Varichev, V.A. (Engineer); Pavlenko, L.I. (Engineer);
and Kurganov, B.G. (Engineer)

TITLE: Experience of the Adjustment of Shot-blast Installations
for Removing Ash Deposits from Boiler Heating Surfaces

PERIODICAL: Teploenergetika, 1959, Nr 10, pp 49-54 (USSR)

ABSTRACT: Previous articles in Teploenergetika Nr 12, 1957, and
Nr 1, 1958, described the use of shot-blasting to clean
boilers type TP-230-2 at the Omsk Heat and Electric Power
Station when burning fuel oil of high ash, and high
sulphur content. Subsequently the design of the equipment
was improved and it was tried out at a number of power
stations burning anthracite dust, including the NesvetayGRES
(power station) on the Rostov Power system. When
anthracite dust is burned, heating surfaces quickly
become contaminated and cleaning is particularly important.
In the Nesvetay station shot-blasting equipment was
installed on boilers of 110 tons per hour operating at
steam conditions of 122 ats. and 485 °C. The boilers are
briefly described: the proportion of unburned material
in their carry-over is of the order of 8-12%. Until the
shot-blasting installation was put in, the boilers could

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SOV/96-59-10-9/22

Experience of the Adjustment of Shot-blast Installations for
Removing Ash Deposits from Boiler Heating Surfaces

operate for 1 to 1½ months, during which the resistance of the convection duct increased by more than 100 mm water and the outgoing flue gas temperature rose by 25-30 °C. Typical curves showing the increase in resistance and flue gas temperature during a month's operation are given in Fig 1. The shot-blasting installation was generally similar to that previously described, but various changes were made and are described in some detail. Outline drawings of the modified shot-blasting installation are given in Fig 2. To reduce losses of shot to atmosphere, the shot traps were reconstructed, to the form illustrated in Fig 3. It was found necessary to fit pieces of wire 1 mm diameter on the conical shutters at the bottom of the shot traps so that a certain amount of air could leak round the shutter and equalise the pressure above it. The results of pressure measurements using the modified shutter are plotted in Fig 5. Minor modifications were made to the ash bunkers to prevent loss of shot to them. The shot bunkers were made of conical section instead of square, and the shot feeders were modified, a new type of

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SOV/96-59-10-9/22

Experience of the Adjustment of Shot-blast Installations for Removing Ash Deposits from Boiler Heating Surfaces

shutter being used. A few other modifications were also made. To clean convective heating surfaces efficiently it is necessary to pass 200-300 kg of shot per square metre of duct section. The area of the convective ducts of the boilers in question was 20.7 m², and shot was delivered at a total rate of 4700 kg/hr, which corresponds to 230 kg/m²/hr. If the equipment is used regularly an operating time of one hour twice a shift is satisfactory. Tests were made to see whether shot-blasting could be used to clean up badly-contaminated surfaces. The results are plotted in Fig 7 and it will be seen that although about 9 tons of shot were passed through the convection shaft there was no reduction either in the resistance to flow or in the flue gas temperature. Subsequent examination showed that some of the shot was resting on top of the existing deposits, which were not removed. Therefore, for shot-blasting to be effective the heating surfaces must be cleaned in the first place and the equipment must be used regularly. Data on the resistance to flow and flue gas temperatures during six weeks' operation with regular use of the shot blasting equipment are plotted in Fig 8.

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3/4

SOV/96-59-10-9/22

Experience of the Adjustment of Shot-blast Installations for
Removing Ash Deposits from Boiler Heating Surfaces

The resistance to flow was maintained constant throughout this period and variations in flue gas temperature resulted only from variations in feed-water temperatures. After 45 days' operation with shot-blasting, the economiser and water heater remained clean and ash deposits were found only in places not reached by the shot. The loss of shot was about 0.6% of the total quantity passed and this could be further reduced by minor design changes. The equipment is reliable and the main parts may be used for the design of similar installations for boilers of other types burning other fuels.

Card 4/4

There are 8 figures and 2 Soviet references.

ASSOCIATION: Vsesoyuznyy teplotekhnicheskii institut, Rostovenergo and Nesvetay GRES (All-Union Thermo-Technical Institute, Rostovenergo (Power System) and Nesvetay Regional Electric Power Station)

VARICHEV, V.A., inzh.

Expansion of servicing areas in turbines and boiler
sections without central thermal shielding. Elek.sta.
31 no.5:18-24 My '60. (MIRA 13:8)
(Electric power plants)

VARICHEV, V.A., inzh.

Experience in operating unitized installations. Elek.sta. 31
no.2:84-86 F '60. (MIRA 13:5)
(Steam turbines)

VARICHEV, V.A., inzh.

Air blast cleaning of the heating surfaces of boilers. Elek. sta. 36
no.8:19-20 Ag '65. (MIRA 18:8)

24(2)

AUTHORS: Sholekhovich, M. L., Vardicheva, V.I. SOV/48-22-12-9/33

TITLE: Investigation of the $PbO - BaO - B_2O_3 - TiO_2$ System
(Issledovaniye sistemy $PbO - BaO - B_2O_3 - TiO_2$)PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958,
Vol 22, Nr 12, pp 1449-1452 (USSR)

ABSTRACT: In the present paper the interaction of lead- and barium borates with lead- and barium titanates is investigated. The authors wanted to explain the effect of these borates on the stability of solid barium titanate and lead titanate solutions and to ascertain the possibility of obtaining them in the form of single crystals from the respective melt. The $PbO - TiO_2 - B_2O_3 - BaO$ system in a melt is a complicated 4-component system and can be represented graphically as a tetrahedron. Data are given concerning the surface of the crystallization cross section $[50\% PbO + 50\% B_2O_3] - PbTiO_3 - Ba(BO_2)_2 - BaTiO_3$ of this tetrahedron. The investigation was carried out in a platinum crucible, by employing the optical "polythermal" method.

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Investigation of the $PbO - BaO - B_2O_3 - TiO_2$ System SOV/48-22-12-9/33

The cross section sides and 24 internal sections were investigated. The arrangement of the sections is shown in figure 1 and the data on the sections and side faces in figures 2-4. Figure 5 shows the dielectric constant course of temperature and also the composition of the melt employed for the preparation of $(Ba-Pb)TiO_3$. Table 2 contains data on crystals. The formation of crystals was confirmed for each single case by Ye. G. Fesenko by means of X-ray structural analysis. The crystals obtained have a perfect shape. The crystals from all the experiments were investigated after annealing for 2 hours at $1200^{\circ}C$. Measurements were made at the Q-meter (kummetr) at a frequency of 10^6 cycles. The authors thank N. S. Novosil'tsev for the interest displayed. There are 5 figures, 2 tables, and 6 references, 4 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-matematicheskii institut pri Rostovskom-na-Donu gos. universitete (Scientific Physico-Mathematical Research Institute at Rostov-na-Donu State University)

Card 2/2

L 10042-63 EWT(1)/EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2/FEC(b)-2/ES(s)-2--ASD/
AFFTC/ESD-3/SSD--Pu-4/Pt-4--IJP(C)/GG/WH
ACCESSION NR: AR3000363 S/0053/53/000/004/EC54/EC54

80
79

SOURCE: RZh. Fizika, Abs. 4E368

AUTHOR: Sholokhovich, M. L.; Khodakov, A. L.; Lezgintseva, T. N.;
Varicheva, V. I.

TITLE: New ferroelectrics with large nonlinearity

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk. un-t, 1961,
12-20

TOPIC TAGS: Ferroelectrics, hafnium-doped, dielectric properties, production techniques

TRANSLATION: The dielectric characteristics and the electric conductivity σ of solid solutions of Ba (Ti, Hf) O sub 3, containing up to 25 molar percent of Ba Hf O sub 3 have been investigated. The ceramic specimens were prepared in accordance with the usual technology, using triple annealing at 100, 1450, and 1500 degrees C, with the duration of the annealing at 1000 C amounting to 20

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L 10042-63

ACCESSION NR: AR3000363

hours, but even under these conditions the specimens which contained more than 5% of Ba Hf O sub 3 were quite porous. Measurements made on single crystals obtained in the form of plates 80 - 500 microns thick from a melt of Ba Ti O sub 3, Ba C O sub 3, and Hf O sub 2 in KF have shown that the Curie temperature decreases linearly with increasing content of Ba Hf O sub 3. The maximum value of Epsilon is observed for a composition containing 6 molar percent of Ba Hf O sub 3. At room temperature, tg Delta of single crystals of the investigative materials ranges from 0.03 to 0.07. The ratio of Epsilon at the Curie point to Epsilon at room temperature reaches 20-30. No such increase in Epsilon is observed in the ceramic specimens. Small amounts of Ba Hf O sub 3 influence noticeably the nomenial properties of the solid solutions. At a frequency of 50 cps, Epsilon increases with increasing field by more than 200 times, and it may reach 100,000 at a field E equals 0.6 kv/cm, with the increase of Epsilon being accompanied by an increase of tg Delta, which goes through a maximum at approximately 1 kv/cm with increasing E, after which it decreases and reached 0.2. In the region of weak fields, the coefficient of reversible nomeniality of the single crystals of Ba (Ti Hf) O sub 3 is much higher than in solid solutions Ba (Ti Sn) O sub 3. The hysteresis loops of these single crystals are rectangular and reach saturation even at fields of 5 kv/cm. An anomaly is observed in the temperature variation of Sigma for most crystals near the Curie

Card 2/3

S/196/63/000/001/007/035
E193/E383

AUTHORS: Sholokhovich, M.L., Kramarov, O.P. and
Varicheva, V.I.

TITLE: Single crystals of lead metazirconate

PERIODICAL: Referativnyy zhurnal, Elektrotehnika i energetika,
no. 1, 1963, 17-18, abstract 1 B56. (In collection:
Segnetoelektriki (Ferroelectrics), Rostov-na-Donu,
Rostovsk. un-t, 1961, 31-36)

TEXT: A method is described for growing single crystals of
 $PbZrO_3$, up to 30 μ in size, from melts containing PbO and ZrO_2
mixtures dissolved in KF, KCl, PbF_2 , $Pb_3(PO_4)_2$, NaCl, Na_2WO_4 or
 Na_2MoO_4 . Another method, entailing the volatilization of NaCl
from a $PbO-ZrO_2-PbCl_2$ melt, made it possible to produce $PbZrO_3$
single crystals, 1-2 mm in size, for which the temperature-
dependence of ϵ was determined (see the figure). The effect of
temperature on the hysteresis loops was also studied. There are
1 figure and 13 references.

Editor's note. In the original the frequency is erroneously given
in "mc/s" instead of "Mc/s".

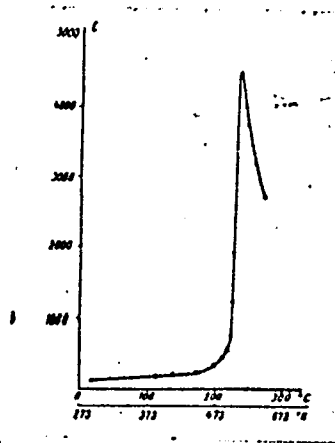
Card 1/2

Single crystals of

S/196/63/000/001/007/035
E193/E383

[Abstracter's note: Complete translation.]

Figure:



Source: ...

Card 2/2

54110 .1136 1145 1160

21340

S/078/61/006/004/014/018
B107/B218

AUTHORS: Sholokhovich, M. L., Varicheva, V. I.

TITLE: The reaction in the system $\text{PbO} - \text{Nb}_2\text{O}_5 - \text{B}_2\text{O}_3$ and in the cut $(50\% \text{PbO} + 50\% \text{B}_2\text{O}_3) - \text{PbNb}_2\text{O}_6 - \text{PbTiO}_3$

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 4, 1961, 944-947

TEXT: The melting processes in the system $\text{PbO} - \text{Nb}_2\text{O}_5 - \text{B}_2\text{O}_3$ were studied up to about 20 mole% of Nb_2O_5 (Fig. 2); besides, the authors investigated the cut $(50\% \text{PbO} + 50\% \text{B}_2\text{O}_3) - \text{PbNb}_2\text{O}_6 - \text{PbTiO}_3$ in the corner $(50\% \text{PbO} + 50\% \text{B}_2\text{O}_3)$ (Fig. 3). The phases of this system can be important because of their piezoelectric properties. The initial substances were: PbO for analysis, chemically pure B_2O_3 , TiO_2 for analysis, Nb_2O_5 with a degree of impurity of about 2 %, including 1.1 % of Ta_2O_5 . X-ray analysis was conducted by Ye. G. Fesenko, and tests for piezoelectric properties

Card 1/5

21340

S/078/61/006/004/014/018
B107/B218

The reaction in the system...

were carried out by A. L. Khodakov. From the system $PbO - Nb_2O_5 - B_2O_3$, 13 cuts were studied. In the region of high content of B_2O_3 , the system separates into component parts. The melts solidify in the form of glass. The major part of the system is occupied by the crystallization surface of lead metaniobate. Two more phases of the side system $PbO - Nb_2O_5$ (A and B) do not remain stable in the ternary system, but decompose already at low temperatures (R_1 588°C, R_2 730°C). During solidification of the melt, $PbNb_2O_6$ single crystals form in glass which may be removed by nitric acid. In this way, single crystals with an edge of 0.5 cm were obtained. These crystals adopt piezoelectric properties when heated at 1300°C for 3.5 hr. Studies of the cut (50% $PbO + 50\% B_2O_3$) - $PbNb_2O_6 - PbTiO_3$ disclosed an un-interrupted series of mixed crystals between $PbTiO_3$ and $PbNb_2O_6$. These rhombic, imperfect crystals of the perovskite type are not piezoelectric. Only after heating at 1300°C for 6 to 9 hr the mixed crystals 75% $PbNb_2O_6 + 25\% PbTiO_3$ and 50% $PbNb_2O_6 + 50\% PbTiO_3$ became piezoelectric. There are 3 figures and 16 references: 4 Soviet-bloc. The two references to

Card 2/5

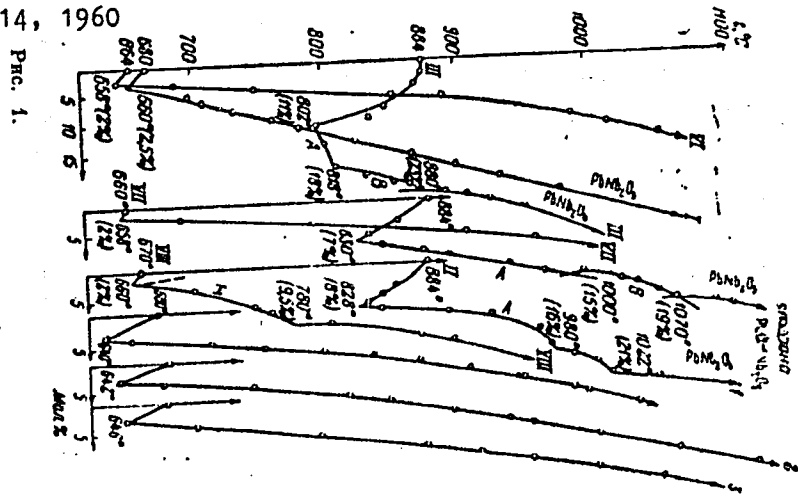
21310

S/078/61/006/004/014/018
B107/B218

The reaction in the system...

English-language publications read as follows: R. S. Roth. J. Res. Nat. Bur. Stand. 62, 2925 (1959); E. C. Subbarao. J. Amer. Ceram. Soc., 42, 448 (1959).

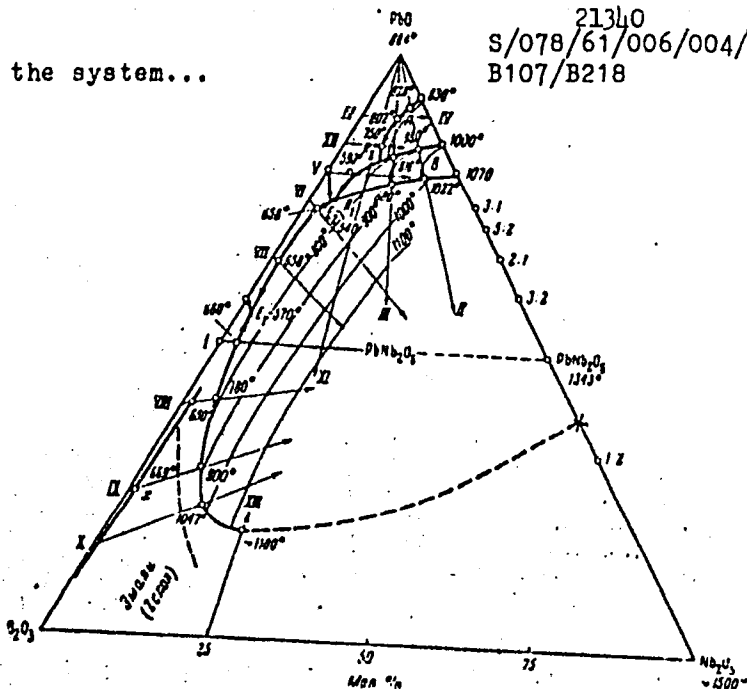
SUBMITTED: March 14, 1960



Card 3/5

The reaction in the system...

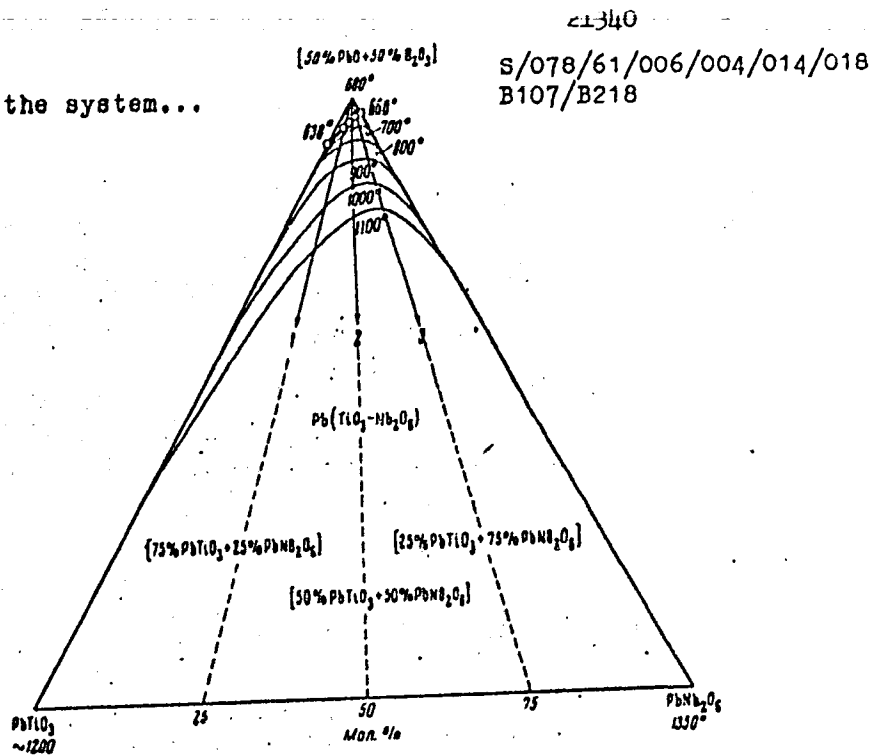
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S/078/61/006/004/014/018
B107/B218



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FIG. 2.

The reaction in the system...



L 7834-66 EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(t)/EWP(b)/EPA(h)

ACC NR: AP5028122 IJP(c) JD/WH SOURCE CODE: UR/0048/65/029/011/2068/2071

AUTHOR: Sholokhovich, M.L.; Novikova, L.V.; Varicheva, V.I.; Kramarov, O.P.; Kupriyanov, M.F.

77
75

ORG: Rostov-on-the Don State University (Rostovskiy-na-Donu gosudarstvennyy universitet)

TITLE: Preparation of solid solutions of barium and lead titanates from water-soluble compounds and characteristics of such solutions [Report, Fourth All-Union Conference on Ferroelectricity held at Rostov-on-the Don 12-16 September 1964]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 11, 1965, 2068-2071

TOPIC TAGS: ferroelectric material, solid solution, barium titanate, lead titanate, dielectric constant, Curie point

ABSTRACT: Chemically pure (Ba, Pb)TiO₃ solid solutions were prepared from water-soluble reagents by coprecipitation from titanium tetrachloride, barium chloride, and lead nitrate solution, and by the exchange reaction between potassium titanyl oxalate and lead and barium nitrates. The chemical procedures are discussed in some detail and the properties of the solid solutions are described briefly. Lead titanyl oxalate synthesized at room temperature from titanium tetrachloride and lead nitrate by the method of B.V.Strizhkov, A.V.Lapitskiy, and L.G.Vlasov (Zh. prikl. khim., 34, 673 (1960)) was always contaminated with lead chloride, as were also the coprecipitated mix-

L 7834-66

ACC NR: AP5028122

2

tures of lead and barium titanyl oxalates. It was not possible so to adjust the pH as to eliminate this contamination. Lead chloride also precipitated when the synthesis was performed at 80°C by the method of W.S.Clabaugh, E.M.Swiggard, and R.Gilchrist (J. Res. Natl. Bur. Standards, 56, No. 5, 289 (1956)) and could only be removed (together with some of the titanyl oxalates) by prolonged washing with hot water. X-ray studies of the coprecipitated materials clearly showed the formation of tetragonal solid solutions after heating to 800°. The degree of tetragonality decreased regularly from lead to barium. The resulting chemically pure solid solutions sintered poorly and it was not possible to obtain dense ferroelectric ceramics by sintering in air at 1100 to 1300°. The Curie point of a ceramic of the composition $(Ba_{0.95}, Pb_{0.05})TiO_3$ derived from the temperature dependence of the dielectric constant at 1 megacycle/sec, was 153°. This is considerably higher than the approximately 140° Curie point usually obtained for ceramics of this composition prepared from technical grade materials. The increase of the Curie temperature is ascribed to the purity of the material. The dielectric constant itself was lower than is usually obtained for ceramics of this composition, owing to the large porosity due to poor sintering. Orig. art. has: 1 figure and 3 tables.

SUB CODE: GC, SS, EM

SUBM. DATE: 00/

ORIG. REF: 009

OTH. REF: 002

VAREGINA, N.N.

Infarct of the papillary muscles. Trudy Inst. im. N.V. Sklif.
5 no.2839-42 '62. (MIRA 1816)

VARIKASH, V.M., red.

[Abstracts of reports of the All-Union Conference on
Thermodynamics and the Kinetics of Phase Transitions]
Tezisy dokladov Vsesoiuznogo soveshchaniia po termo-
dinamike i kinetike fazovykh perekhodov, 1962. Minsk,
AN BSSR, 1962. 51 p. (MIRA 17:10)

1. Vsesoyuznoye soveshchaniye po termodinamike i kinetike
fazovykh perekhodov, 1962.

L 19752-63

EWP(q)/ENT(m)/ENP(B)/BDS AFFTC/ASD RM/JD/MAY

ACCESSION NR: AT3001944

S/2912/62/000/000/0420/0424

AUTHORS: Sirota, N.N.; Varikash, V.M. ~~XX~~ B

TITLE: On the rate of growth of crystals of triglycinsulfate in the vicinity of the Curie temperature. 1 27

SOURCE: Kristallizatsiya i fazovyye perekhody. Minsk, Izd-vo AN BSSR, 1962, 420-424

TOPIC TAGS: crystal, crystallization, crystallography, triglycinsulfate, Curie, temperature, seignette, electricity, seignette-electric, phase, transition, change, supersaturation, supercooling

ABSTRACT: The paper describes experimentation which revealed a significant anomaly of the rate of growth on faces (110) and (001) of crystals of triglycinsulfate (TGS) in the vicinity of the Curie temperature (T). The process reported was studied as a function of the supercooling of solutions, the saturation T of which lies within the 30-60°C interval. The Curie T, that is, the T of seignette-electrical phase transformation of TGS lies in the 47-50° interval. The TGS was synthesized from glycol and concentrated H₂SO₄. The substance obtained was recrystallized 4 times in distilled water. The test equipment used was similar to that employed by G. Bliznakov and Ye. Kirkova (Zeitschr. f. Phys. Chemie, no. 3/4, 1957). The equipment consists basically of a saturator in which the solution was saturated through

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ACCESSION NR: AT3001944

the dissolution of small crystals placed on a glass filter and was then brought into another vessel in which circulating cold water supersaturated the solution. Crystallization began on a small crystal, 3-4 mm in size, with clearly defined faces, which had been fastened on a holder in such a way that the test face was at the level of a microscope sighting tube, parallel to the visual ray, and was oriented suitably relative to the flow lines of the supersaturated solution (usually parallel thereto). Micrometric readings were made every 4-5 hrs at low degrees of supersaturation (SS), every 45-60 min at elevated degrees of SS. The rate of change of translation (RC) of the face (001) as a function of T for various degrees of supercooling grows up to T close to the Curie T. In the vicinity of that T (in the 35-45° range) the RC decreases. Above 45° it grows again sharply. The RC of the (110) face behaves differently: It increases with increasing T up to 46-47°, drops slightly in the 47-50° interval, and then grows again. With more elevated degrees of supercooling the RC anomaly near the Curie T decreases and vanishes completely for a supercooling of 1.4°C. Orig. art. has 4 figs.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 16Apr63	ENCL: 00
SUB.CODE: CH, PH, MA	NO REF SOV: 002	OTHER: 004

Card 2/2

L 19757-63

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

ACCESSION NR: AT3001947

S/2912/62/000/000/0439/0445

AUTHORS: Sirota, N. N.; Varikash, V. M.

TITLE: Changes in heat conductivity and linear expansion coefficient in the vicinity of the Curie temperature in triglycinsulfate 27

SOURCE: Kristallizatsiya i fazovyye perekhody. Minsk, Izd-vo AN BSSR, 1962, 439-445

TOPIC TAGS: crystal, crystallization, crystallography, temperature, point, Curie, seignette, seignette-electrical, transformation, heat conductivity, linear expansion coefficient, expansion, linear, triglycinsulfate.

ABSTRACT: The paper describes an experimental investigation of the change in heat conductivity (HC) and the linear expansion coefficient (LEC) of triglycinsulfate (TGS) along the axes [100], [010], and [001] between 20 and 60°C, a temperature (T) range that comprises the seignette-electrical transformation segment of TGS (47-50°C). Measurements of the HC were performed as follows: Two half-crystals were fitted together closely along the (001) plane, and a heater wire and a thermocouple were clamped between them at a distance of 6-7 mm from one another. HC along the [100] axis was determined by orienting the heater wire

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L 19757-63

ACCESSION NR: AT3001947

and the thermocouple along the axis $[010]$. HC along the axis $[010]$ was measured by orienting the two wires along the axis $[100]$. A heat pulse was imparted by energizing the heater wire, and the change in T, the time required to attain the T maximum, and the maximum-T value were measured. The HC curve vs. T in the direction $[100]$ shows a nearly linear decrease up to the Curie point; above the Curie T, the decrease continues linearly, but at a smaller slope. The HC-vs.-T curve in the direction $[010]$ is nearly linear from 20°C to the Curie point, rises to a hump at $50-51^{\circ}$, and then continues with the same slope as the initial segment. These anomalies are attributed to a change in the character of the thermal motions of the ions. The measurements of the LEC were performed with a quartz dilatometer. T steps of 5 to 6° were reduced to $0.4-0.5^{\circ}$ in the vicinity of the Curie T. Hold: 20-30 min. Specimens were cut from a TGS single crystal in the form of parallelepipeda 3×3 mm in cross section, 18-25 mm long. Specimens cut along the axes $[100]$ and $[010]$ exhibit a nonlinear decrease in length up to the Curie point and a linear increase beyond it. The exact opposite occurs with specimens cut along the axis $[001]$. The results obtained concur with those of the X-ray tests by Z. I. Yozhkiva, et al. (Kristallografiya, v.1, no.1, 1956). Wherever differences are noted, such as those in the character of the change of the LEC along the $[010]$ axis and some of the differences in the absolute values of the LEC, the present testing method is regarded to be more accurate than the

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X-ray method. The tensor surfaces of the LEC at 30°, 40°, and 50°C are drawn both in cross section and in isometric representation. The isometric images of the tensor surfaces below and above the Curie point show that at the Curie point there is not only a rotation of the surfaces, but also a deformation, as a result of which increased internal stresses arise in the TGS crystal. Orig. art. has 6 figs.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 16Apr63

ENCL: 00

SUB CODE: CH, PH, MA

NO REF SOV: 004

OTHER: 002

Card 3/3

SHARIN, N. S. and VASILKASH, V. M.

"Change of X-ray Diffraction and Physical Properties of Triglycine Sulfate
at the Curie Point."

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

VARIKASH, V.K.

Crystal growing by the osmosis method. Krist. zhid. no. 3:25-27
'63. (MIRA 17:7)

VARIKASH, V.M.

Conference on the thermodynamic and kinetic aspects of phase
transitions. Kristallografiia 8 no.5:815 S-0 '63. (MIRA 16:10)

SIROVA, N.N.; VARIKASH, V.M.; OVSEYCHUK, E.A.

Intensity variation of Bragg's reflexes at the Curie point in
triglycine selenate. Dokl. AN BSSR 8 no.4:220-222 Ap '64.
(MIRA 17:6)

1. Institut fiziki tverdogo tela i poluprovodnikov AN BSSR.

GORSKIY, F.K., dots., otv. red.; VARIKASH, V.M., otv. red.;
SIROTA, N.N., akademik, red.

[Mechanism and kinetics of crystallization] Mekhanizm i kinetika kristallizatsii. Minsk, Nauka i tekhnika. 1964.
460 p. (MIRA 17:11)

1. Akademiya navuk BSSR, Minsk. Addzel fiziki tsverdaha tsela i paupravadnikoi. Nauchnyy sovet po fizike tverdogo tela.
2. Akademiya nauk Belorusskoy SSR (for Sirota).

ACCESSION NR: AP4030640

8/0048/64/028/004/0666/0668

AUTHOR: Sirota, N.N.; Varikash, V.M.; Ovseychuk, E.A.

TITLE: Changes in the intensity of x-ray scattering by triglycino sulfate at the Curie point [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, 666-668

TOPIC TAGS: Triglycine sulfato, triglycine sulfate Curie point anisotropy, triglycine sulfate x-ray reflection

ABSTRACT: The intensity of a number of x-ray reflections from triglycino sulfate was measured at temperatures from 0° to 90°C. Copper K α radiation was employed. After it was ground to a powder, the sample was annealed for 24 hours at 70°C. The temperature was held constant to within $\pm 0.3^\circ\text{C}$ during measurement. The intensity of the reflections was determined from the number of counts recorded by a mechanical counter during the exposure, and also from the area under the curve traced by a recording galvanometer. The intensity of some reflections (including (024) and (344)) decreased monotonically with increasing temperature over the full range investigated.

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ACCESSION NR: AP4030640

As regards these reflections, the Curie point was marked only by an increase in the scatter of the experimental points. The intensity of other reflections (including (040) and (031)) reached a pronounced maximum at the Curie point. The different behavior of the different lines is ascribed to effects of crystal structure, and particularly to those of the system of hydrogen bonds. The behavior of the x-ray reflections indicates that the atomic vibrations are strongly anisotropic at the Curie point. This agrees with earlier findings based on measurements of the linear expansion coefficients and the elastic moduli (N.N.Sirota and V.M.Varikash, Sb. Kristallizatsiya i fazovy*ye perekhody*, p.439, Izd. AN BSSR, Minsk, 1962; N.N.Sirota, V.M.Varikash and N.P.Tekhanovich, Ibid., p.435; Z.I.Yezhkova, G.S.Zhdanov and M.M.Umanskiy, Kristallografiya, 4, 1959). Orig.art.has: 2 figures.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 30Apr64

ENCL: 00

SUB CODE: GP

NR REF SOV: 006

OTHER: 006

Card 2/2

VARIKASH, V.M. [Varykash, V.M.]

Growing of triglycene sulfate crystals and the change
in physical properties in the region of the Curie
temperature. Vestsi AN BSSR. Ser.fiz.-mat.nav. no.1:
101-109 '65. (MIRA 19:1)

VARIKASH, V.M.

Microhardness of triglycine sulfate in the region of the
Curie temperature. Dokl. AN BSSR 9 no.12:204-206 D '65.
(MIRA 19:1)

1. Institut fiziki tverdogo tela i poluprovodnikov AN BSSR.

VARIKLECHKOV, B.

VARIKLECHKOV, B. Utilizing valve lightning conductors with reference to maximal usage of their safety effect. p.11.

Vol. 7, no. 5, May 1956 ELEKTROENERGIJA Sofia, Bulgaria

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 10,
Oct. 1956

VARILIU, G.

Distr: 4E2c(j)

7-Bromocenaphthene condensation with α -iodophenyl-
 acetonitrile. G. Variliu and N. Barbolescu. *Analele Univ.*
C.I. Parhon "Bucuresti" Ser. chim. Vol. 14, 85-9 (1957).
 —The influence of substitution on the sapon. of the CN
 group is studied. Acenaphthylphenylacetonitrile (I), m.
 131-3°, and acenaphthylethylphenylacetonitrile (II), m.
 115°, are prepd. from 7-bromocenaphthene and NaNH₂ in
 anhyd. ether with PhCH₂CN and PhCH₂EtCN. Hydroly-
 sis of I gives acenaphthylphenylacetic acid while II did
 not hydrolyze with either acid or base.

JR
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May

JGJ