2/2 046 UNCLASSIFIED PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AP0112722
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PAPER IS CONCERNED WITH THE INVESTIGATION OF LONGITUDINAL ELECTRIC FIELDS (IS APPROXIMATELY EQUAL TO 1 V-CM) ARISING IN A HOMOGENEOUS PIEZOELECTRIC CRYSTAL AT HIGH LEVEL OF OPTICAL EXCITATION. THE SIGN OF THE EFFECT CORRESPONDS TO THE DRAG OF FREE CARRIERS (ELECTRONS IN THE CASE OF CDS) IN THE DIRECTION OF LIGHT PROPAGATION. THE MAGNITUDE OF THE EFFECT AND ITS KINETICS HAVE BEEN RELATED TO LIGHT INTENSITY, TEMPERATURE, CRYSTAL ORIENTATION, AND THE DISTANCE BETWEEN THE PROBE POINTS. THE EFFECT IS ASSUMED TO BE A RESULT OF THE GENERATION OF A PHONON PACKET, REFERRED TO BY THE AUTHORS AS ACOUSTOOPTICAL DOMAIN, AND CARRIER DRAG BY THIS DOMAIN. CALCULATIONS BASED ON THE BOLTZMANN EQUATION FOR THE ELECTRON DISTRIBUTION FUNCTION GIVE A REASONABLE PHONON DENSITY INSIDE THE DOMAIN WHICH IS NECESSARY FOR GENERATING THE ELECTRIC FIELD OBSERVED. THE ESTIMATIONS BASED ON THE CALCULATED PHONON DENSITY SHOW THAT CONSIDERABLE MECHANICAL STRESSES EXIST IN THE DOMAIN AREA WHICH CAN RESULT IN THE DESTRUCTION OF THE CRYSTAL WHEN INCREASING THE LIGHT INTENSITY; SO FAR THE EFFECT EXAMINED CAN BE DIRECTLY RELATED TO THE PROBLEM OF OPTICAL STRENGTH.
FACILITY: A. F. IOFFE PHYSICO-TECHNICAL INSTITUTE, ACADEMY OF SCIENCES OF THE USSR, LENINGRAD. FACILITY: INSTITUTE OF APPLIED PHYSICS, MOLDAVIAN ACADEMY OF SCIENCES, KISHINEV.

UNCLASSIFIED

USSR UDC: 681.325.5

TIMOFEYEV, B. B., SUKHOMLINOV, M. M., FERENETS, N. K., STEPKO, D. P., NIKITENKO, V. M., OVERKO, V. A., PRSHISOVSKAYA, T. A., LYFAR', I. N.

"A Specialized Digital Computer"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 47, Dec 73, Author's Certificate No 408304, Division G, filed 23 Jun 70, published 10 Dec 73, p 172

Translation: This Author's Certificate introduces a specialized digital computer which contains registers, counters, and a control module connected to the registers and to the overflow outputs of the counters. The device also contains adders, flip-flops, an auxiliary code formation module, coincidence gates, buffer circuits, and a cadence pulse circuit connected to the input of a circuit for obtaining digit potentials. The outputs of this circuit are connected to the inputs of the control module. As a distinguishing feature of the patent, the functional possibilities of the computer are extended by adding a circuit for isolating transition signals, a transition counter, and three auxiliary registers. The output of the transition counter is connected to the first input of the first adder,

TIMOFEYEV, B. B., et al., USSR Author's Certificate No 408304

whose output is connected to the input of the transition counter. The output of the first auxiliary register is connected to its input through the first coincidence gate, while the outputs of the second and third registers are connected through the second and third coincidence gates to the first inputs of the second and third adders whose outputs are connected to the inputs of the second and third registers respectively. The output of the second adder is connected through the fourth coincidence gate to the first input of the first buffer circuit. The second input of this buffer circuit is connected to the output of the first register, and the output of the buffer circuit is connected to the first input of the circuit for isolating transition signals. The second input of this circuit is connected to the output of the transition counter and, through the fifth and sixth coincidence gates, to the first inputs of the second and third buffer circuits. The outputs of these buffer circuits are connected to the second and third inputs, whose outputs are connected to the second inputs of the second and third adders respectively. The output of the circuits for isolating transition signals is connected through the seventh and eighth coincidence gates to the second inputs of the second and third buffer circuits respectively and, through the ninth coincidence gate,

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TIMOFEYEV, B. B., et al., USSR Author's Certificate No 408304

to the input of the auxiliary code formation module whose output is connected to the third input of the second buffer circuit. The output of the third register is connected through the tenth coincidence gate to the set input of the flip-flop whose output is connected through the eleventh coincidence gate to the second input of the first adder.

USSR UDC 533.69

FERENETS, V. A., and ZAYATS, P. K., Kazan' Order of the Labor Red Banner Aviation Institute

"A Pneumoelectric Monitor for Aerodynamic Angles"

USSR Author's Certificate No 366121, Filed 19 Jan 70, Published 16 Jan 73 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar (a) 73, Claim No 1400485/40-23)

Translation: 1. A pneumatic monitor for aerodynamic angles containing a cylindrical nozzle, placed perpendicular to the unperturbed incoming flow with two series of inlets warmed by the electrical current of a semiconductor thermistor inserted in the measuring circuit, distinguished by the fact that in order to increase the reliability of operation and decrease the pressure pulsation in the inlets, a flow chamber connected with the inlets is introduced in the pneumatic scheme of the transducer.

2. The pneumoelectric transducer in paragraph 1, is distinguished by the fact that, in order to increase the accuracy of measurement, capsules of thermoanemometric transformers, consisting of a bead thermistor, a nozzle and an insulating sleeve, are mounted in the channels at the chamber outlet.

3. The pneumoelectric transducer in paragraph 1 is distinguished by the

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FERENETS, V. A. and ZAYATS, P. K., USSR Author's Certificate No 306121, Filed 19 Jan 70, Published 16 Jan 73

fact that, in order to increase the range of aerodynamic angles measurable, a servo system is introduced, controlled by a signal of mismatch with the output of the measuring scheme of the transducer, providing such a position of the nozzle relative to the air flow, that equality of pressure in the inlets is achieved.

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UDC 539.4:536.453

LOZINSKIY, M. G., FERENETS, V. YA.

"Application of High Temperature Metallography Methods in Studying the Mechanism of Plastic Deformation of Metallic Materials Under Heating"

V sb. Novyye napravleniya razvitiya vysokotemperatur. metallogr. (New Trends in the Development of High Temperature Metallography -- Collection of Works), Moscow, "Mashinostroyeniye", 1971, pp 85-95 (from RZh-Mekhanika, No 12, Dec 71, Abstract No 12V1552)

Translation: The microstructure was studied to determine the plastic deformation metal of heat-resistant austenite Kh12N22T3MR steel under stretching at a constant rate of 3% for 1 hr at 700°. A quantitative evaluation was made of the intergranular deformation in the Kh12N22T3MR steel samples tested. It was shown that high temperature working considerably raises the resistance deformation along the grain boundaries as compared with treatment by other methods. The microstructure was analyzed and a quantitative estimate was made of the contribution of the boundaries to the total lengthening of gold samples in the temperature range from room temperature to 800° under stretching at constant

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LOZINSKIY, M. G., FERENETS, V. YA., Novyye napravleniya razvitiya vysokotemperatur. metallogr., Moscow, "Mashinostroyeniye", 1971, pp 85-95

velocity and changes in the strength properties were also evaluated. The studies showed that there occurs a sharp weakening of the grain boundaries of gold at 200-300°; with a further rise in temperature the degree of weakening of the grain boundaries is practically unchanged. Authors' abstract.

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FERFIL'FAYN, I. L.

Science
USSR

JPRS 56168

5 June 1972

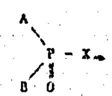
UDC 547.26'118

SYNTHESIS AND INVESTIGATION OF PHOSPHORIC ACID ESTERS CONTAINING A TRICHLORMETHYL GROUP. THE PREPARATION CHLOFOSFOL

[Article by Ye. S. Shepeleva, M. S. Horedach, P. I. Sanin, A. P. Gol'far, Yu. S. Kagan, O. Ts. Kim, M. L. Tarakhovskiy, Ye. G. Timoshenko, I. L. Ferfil'fayn, Institute of Petrochemical Synthesis imeni A. V. Topchiyev, USSR Academy of Sciences; Moscow, Doklady AN SSSR, Russian, Vol 203, No 4, 1972, signed to press 9 July 1971, pp 856-857]

P/S

It is known that the physiologically active phospho-organic compounds — cholinesterase inhibitors are pentavalent phosphorus compounds generally represented by the formula:



Here A and B are the framing alkoxyl, alkyl, aryl and other groups; X is the weak acid residue. Subsequently, the X bond with phosphorus has an anhydride character and the substance itself has the properties of a phosphorylating agent. Utilized in the capacity of group X were precipitates of hydrofluoric acid and dyrocyanic acid, phenols and mercaptans of variable structure and others.

Trichloroalkoxy groups were used in the present work for X since it is known that the corresponding alcohols containing a trichlormethyl group are markedly acidic. A number of trichloralkylphosphoric acid esters was synthesized and investigated. Their characteristics are cited in Table 1. The synthesized esters are colorless, slightly mobile liquids with a weak aromatic scent, easily soluble in organic solvents, mineral and vegetable oils, and poorly soluble in water. The synthesis scheme includes the following reactions:

[I - USSR - D]

AA0046996 F

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, I-70

241464 EJECTOR HEAT-EXCHANGER comprises chamber 1 provided with tubes for transmitting vapour, and high pressure nozzle 2 coaxially placed with the chamber. The low-pressure nozzle is used for throwing the cooling medium away and this improves the heat-exchanger properties.

9.2.68 as 1216088/24-6. V.G.FERNZEL, KHARKOV CENTRAL CONSTRUCTION BUREAU. (29.9.69) Bul 14/18.6.69.

Class 17d. Int.Cl.F 25f.

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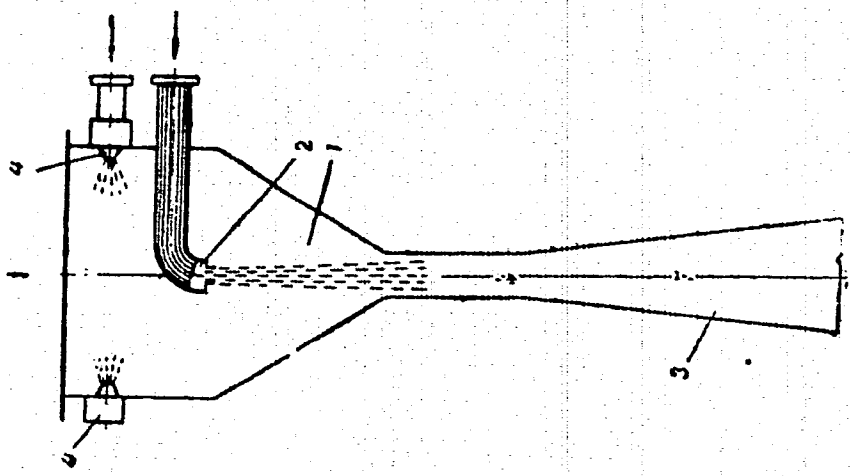
19790412

AA0046996



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19790413

USSR

UDC: 548.5

FESENKO, Ye. G., GAVRILYACHENKO, V. G., SPINKO, R. I., MARTYNENKO, M. A., GRIGOR'YEVA, Ye. A., FERONOV, A. D., Rostov State University

"Growth of Lead Titanate Crystals and Investigation of Their Domain Structure"

Moscow, Kristallografiya, Vol 17, No 1, Jan/Feb 72, pp 153-157

Abstract: A method is described for growing laminar $PbTiO_3$ crystals in the $PbO-TiO_2-B_2O_3$ system, and the results of a study of the domain structure by the optical method and the method of etching are presented. In numerous experiments on crystal growing in this system, it was found that lead titanate sometimes crystallizes in the form of transparent plane-parallel plates with a perfect {100} face. Experiments showed that the yield of perfect laminar crystals depends on the temperature gradient with respect to height in the melt, and the cooling rate. The optimum conditions are less than

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FESENKO, Ye. G. et al., Kristallografiya, Jan/Feb 72, pp 153-157

20 deg/hr for the cooling rate, and less than 20 deg/cm for the vertical temperature gradient with an approximate ratio of 1:1 between these parameters. The region of laminar crystal growth is shown by the shaded portion on the phase diagram. It was found that observation of optimum conditions gives fairly large crystals (up to 1.5 cm^2) with thicknesses from 10-15 μ to 1-1.5 mm. The domain structures of the crystals are classified. Etching figures are shown which correspond to 180° domain configurations, as well as to large monodomain regions with stable antiparallel domains in the surface layer. Some of the particulars of the phase transition are discussed. Four figures, bibliography of eighteen titles.

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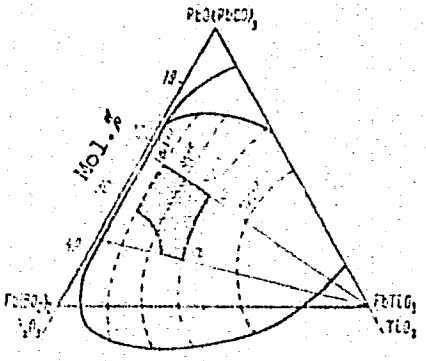
FESENKO, Ye. G. et al., Kristallografiya, Jan/Feb 72, pp 153-157



Phase diagram of the $PbO-B_2O_3-TiO_2$ system and the region of laminar crystal growth (shaded area)

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USSR UDC: 621.385:530.145.6:623.621.317.17

GORDEYEV, A. N., LEYVA, A., FERRARI, O. M.

"On Measuring the Correlation Function of Optical Paths in a Turbulent Atmosphere by Using a Twin-Wave Interferometer"

V sb. Radiofiz. i rasprostr. elektromagnitn. voln (Radio Physics and Propagation of Electromagnetic Waves--collection of Works), Moscow, 1970 (from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D551)

Translation: The authors analyze the statistical nature of propagation of laser beams in a turbulent atmosphere. Theoretical substantiation is given for the method of measuring the phase correlation function by using a modified Jamin twin-beam interferometer with beam splitting by a plane-parallel plate. Expressions are derived for determining the correlation coefficient from the measured contrast of the resultant interference pattern. The advantages of the given method over others are demonstrated. One illustration, bibliography of eight titles. N. S.

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USSR UDC 621.378.32:539.2

FERSMAN, I. A., KHAZOV, L. D.

"Photoelectric Phenomena Which Develop on the Surface of a Transparent Dielectric Subjected to Laser Emission"

Moscow, Kvantovaya Elektronika, No 2, 1971, pp 74-79

Abstract: An investigation was made of the photocurrents which arise on the surface of a transparent dielectric in air when exposed to laser emission with a flux density several times below the threshold energy which corresponds to sparking. Fatigue of the photocurrent was observed with repeated exposure of the same section of the surface to a beam of constant density, the photocurrent signal being restored when the flux density was increased. It is shown that the signal recorded was photoemissive. Preliminary repeated exposure of the surface to a laser flash of subthreshold intensity causes almost no increase in the luminous strength of the surface. An explanation of the observed phenomena is proposed. The amplitude of the first-flash photocurrent is strongly dependent on the quality of the surface finish, and in this sense correlates with destruction thresholds. Six figures, one table, bibliography of 8 titles.
1/1

1/2 032 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--DEPENDENCE OF THE BREAKDOWN THRESHOLD OF A TRANSPARENT DIELECTRIC ON LASER PULSE DURATION -U-

AUTHOR-(04)-NESTEROV, L.A., POPLAVSKIY, A.A., FERSMAN, I.A. KHAZOV, L.D.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL TEKHNICHESKOI FIZIKI, VOL. 40, MAR. 1970, P. 651-653

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LASER PULSE, DIELECTRIC BREAKDOWN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/1256 STEP NO--UR/0057/70/040/000/0651/0653

CIRC ACCESSION NO--AP0115273
UNCLASSIFIED

2/2 032 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0115273

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL DETERMINATION OF THE ENERGY DENSITY THRESHOLD FOR LASER INDUCED SURFACE BREAKDOWN OF A TRANSPARENT DIELECTRIC AT GIVEN LASER PULSE DURATIONS AND BEAM DIAMETERS. AN EQUATION RELATING THESE FACTORS IS DERIVED FOR PULSE DURATIONS RANGING FROM 2 MICROSEC TO 20 NSEC AND SAMPLE DIAMETERS FROM 8.7 TO 340 MICRONS. THE EQUATION IS ALSO APPROXIMATELY ACCURATE FOR GIANT PULSE EMISSION OF ABOUT .001 SEC IN DURATION AND FOR INTERNAL BREAKDOWN OF THE MATERIAL. IT IS SUGGESTED THAT THE DEPENDENCE OF THRESHOLD POWER ON PULSE DURATION IS DUE TO THERMAL DIFFUSION FROM THE IRRADIATED ZONE.

UNCLASSIFIED

USSR UDC 535.22+621.317.36.081:621.375.826

LEYKIN, A. YA., SIKORA, S. V., SOLOV'YEV, V. S., and FERTIK, N. S.

"On Measuring the Speed of Light and Setting Up Frequency Measurements in the Submillimeter Band"

Khar'kov, Ukr. resp. nauch.-tekhn. konf., posvyashch. 50-letiyu metrol. sluzhby USSR, 1972 -- sb. (Ukrainian Republic Scientific and Technological Conference Honoring the 50th Anniversary of the Ukrainian SSR's Metrological Service, 1972 -- Collection of Works), 1972, pp 18-19 (from Referativnyy Zhurnal -- Metrologiya i Izmeritel'naya Tekhnika, No 2, 1973, Abstract No 2.32.53)

Translation: One of the most precise methods for measuring the velocity of electromagnetic wave propagation was developed under the leadership of G. S. Simkin, and consists of simultaneously measuring the frequency and wave length of radiation in the 8-mm band. It is a well known fact that, in this case, the largest component of the total error is caused by the indeterminacy of the wave front during the measurements of the wave length. The diffraction correction, which must be computed under these circumstances, is determined by calculating the field at a number of points on the radiator's aperture. The natural way of reducing or even eliminating this error is to approximate the radiator's long-range zone, for the purpose of creating a quasiplane wave in

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LEYKIN, A. YA., et al., Ukr. resp. nauch.-tekhn. konf., posvyashch. 50-letiyu metrol. sluzhby USSR, 1972 -- sb, pp 18-19

the area of the measurements. In this case, an approach based on the shorter (on the order of 0.05-0.5 mm) wave lengths proves to be promising. The existence of lasers operating in this band made it possible to develop a set of equipment and to make preliminary measurements on the 0.337 mm wave length. This made it possible for the following to be accomplished: 1) research in the characteristics of lasers; 2) research in frequency transformers operating in the submillimeter band; 3) the creation of frequency synthesizers operating in the submillimeter band; 4) measurement of the wave lengths of lasers operating in the submillimeter band; 5) the creation of a standard for optical band frequencies. The complex of projects that the authors carried out made it possible to make the first measurements of the speed of light in a vacuum for waves with λ = 337 microns.

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USSR

UDC: 529.78

LEYKIN, A. Ya., TKACHENKO, V. S., FEDULOV, V. M., FERTIK, N. S.

"Cesium Nuclear-Beam Reference in the Secondary Frequency and Time Standard of Khar'kov State Institute of Measures and Measuring Instruments"

Tr. Metrol. In-tov SSSR. Khar'kov. NII Metrol. [Works of Metrological Institutes of the USSR. Khar'kov. Scientific Research Institute for Metrology], 1972, No 7, pp 80-99 (Translated from Referativnyy Zhurnal Metrologiya i Izmeritel'naya Tekhnika, No 4, 1973, Abstract No 4.32.540, from the Resume).

Translation: Results are presented from studies of the short-term and long-term instability of the frequency of cesium nuclear beam standards. The reproducibility of the frequency of a cesium nuclear beam standard, measured by comparison of the frequency of two standards in the AFC mode, is $3.6 \cdot 10^{-11}$. It is shown that the relative error introduced by the electronics developed at the Khar'kov State Institute of Measures and Measuring Instruments for the cesium standard is not over $3 \cdot 10^{-12}$. The change in phase difference in the arms of the U-shaped resonator with time was tested by measurement of the quality of the U-shaped resonator and width of the spectral absorption lines.

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LEYKIN, A. Ya., et al., Tr. Metrol. In-tov SSSR. NII Metrol., 1972, No 7, pp 80-99

The measurement, continued over 10 days, showed that the frequency shift due to changing phase difference was not over $(1-2)\cdot10^{-12}$. 11 figures, 3 bibliographic references.

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USSR

UDC: 529.78

LEYKIN, A. Ya., ROVINSKIY, V. Z., TOMASHKO, I. V., FERTIK, N. S.

"Use of Passive Rubidium Frequency Measures as Storage Devices in the Time and Frequency Service Operated by the Khar'kov State Institute of Measures and Measuring Instruments"

Tr. Metrol. In-tov SSSR. Khar'kov. NII Metrol. [Works of Metrological Institutes of the USSR. Khar'kov. Scientific Research Institute for Metrology], 1972, No 7, pp 360-374 (Translated from Referativnyy Zhurnal Metrologiya i Izmeritel'naya Tekhnika, No 4, 1973, Abstract No 4.32.538, from the Resume).

Translation: The primary characteristics of passive rubidium frequency measures which have been developed and the first results of their use as storage devices in the time and frequency service by the Khar'kov State Institute of Measures and Measuring Instruments are reported. The long-term frequency instability of the rubidium storage devices is $(1.5\text{-}2)\cdot10^{-11}$. The mean square relative random frequency deviation from its mean value with a time interval measurement of one day. No systematic drift of the devices exceeding the measurement of error was discovered over the measurement time (two months). The short-term frequency instability of the devices is

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USSR

LEYKIN, A. Ya., et al., Tr. Metrol. In-tov SSSR. NII Metrol., 1972, No 7, pp 360-374

$1.5 \cdot 10^{-10}$	with a time measurement interval of	0.1	sec
$5 \cdot 10^{-11}$	"	"	1 sec
$1.5 \cdot 10^{-11}$	"	"	10 sec
$3 \cdot 10^{-12}$	"	"	100 sec
$2.5 \cdot 10^{-12}$	"	"	1 hr

The values of relative mean square random frequency variation are presented. 3 figures, 2 biblio. refs.

2/2

USSR

UDC 621.791.856.2.03

GUREVICH, S. M., NERODENKO, M. M., POVOD, A. G., TETERVAK, A. Z., ASNIS, YE. A., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences UkrSSR, GRISHIN, V. K., FERTIKOV, V. G., ESTRIN, V. N., LEVKOVICH, R. M., Moscow

"Equipment for Welding Chemically-Active Refractory Metals in a Controlled High Purity Helium Atmosphere"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 70, pp 45-47

Abstract: A description is given of equipment for manual and automatic electric welding of refractory metals in a controlled atmosphere of high-purity helium. The equipment, which was developed at the Institute of Electric Welding imeni Ye. O. Paton, ensures continuous control of oxygen, nitrogen, and water vapor impurities and helium regneration. It consists of a welding chamber with a vacuum system; 2) equipment for helium purification and 3) a helium purity control system. A photograph and schematic diagram of the installation are presented. The welding chamber (700 mm in diameter, volume, approximately 1000 l) is made of

USSR

GUREVICH, S. M., et al., Avtomaticheskaya Svarka, No 8, Aug 70, pp 45-47

1Kh18N9T steel. It is provided with a VN-1 suction pump, making it possible to obtain a 2 x 10-5 torr vacuum in the chamber with full load. A sorption method using activated carbon and zeolite at liquid nitrogen temperature at an absorber pressure of 150 atm is used for helium purification. A KhG-type gas chromatograph is used for helium purity control.

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1/2 013 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--REGENERATION OF TREATED ACTIVATED CARBON -U-

AUTHOR-(03)-FERTMAN, G.I., TIKHOMIROV, V.G., SAVCHENKO, N.YA.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 264,316

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970 47(9)

DATE PUBLISHED--03MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATALYST REGENERATION, ACTIVATED CARBON, CHEMICAL PATENT, WATER PURIFICATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0830 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0136264

UNCLASSIFIED

2/2 013 UNCLASSIFIED

CIRC ACCESSION NO--AA0136264 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TREATED ACTIVATED C, USABLE FOR PURIFYING H SUB2 O, ALC. MIXTS., WITH NO VOLATILE COMPONENTS AND INCREASED ADSORPTION ACTIVITY, IS PREPD. BY ALKALIZING IT WITH A SOLN. OF CAUSTIC SODA TO PH 8.2-8.8, PASSING A SOLN. OF NACL THROUGH A LAYER OF IT TO PURIFY IT FROM ABSORBED INORG. SALTS AND ORG. SUBSTANCES, AND TREATING IT WITH H SUB2 O VAPOR.

UNCLASSIFIED

USSR

UDC 681.327

OMELIN, V. M., OKHOTIN, S. M., ROMANOV, V. V., Engineers, PETRENKO, A. I., Doctor of Technical Sciences, FESECHKO, V. A., Candidate of Technical Sciences

"All-Purpose Graphical Data Input Device for a Digital Computer"

Moscow, Pribory i Sistemy Upravleniya, No 2, February 1971, pp 6-7

Abstract: A graphical data conversion device designed for converting graphical documents to code has been developed at the All-Union Scientific Research Institute of Exploration Geophysics jointly with the Department of Technical Electronics of Kiev Polytechnical Institute. Its technical parameters make it possible to read a variety of graphical data including single curves, families of curves, and various sets of outlines. A block diagram of the device, its operating time diagram, data allocation in memory, and basic technical specifications of the device are presented. It is pointed out that in contrast to the Luch and Graf graphical data input devices based on the same principle of color recognition, the present design achieves parallel color recognition so that it can read six colors simultaneously -- black, red, blue, green, yellow, and one other arbitrary color. The basic units of the device are an electromechanical scanner with an optical system and tape drive, a video pulse shaper,

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USSR

OMELIN, V.M., et al., Pribory i Sistemy Upravleniya, No 2, February 1971, pp 6-7

a color separating unit, encoding and output units, and a monitoring and control unit.

2/2

USSR

UDC: 681.327

FESENKO, A. I.

"On the Possibility of Automatically Feeding Discrete Information Into the 'Promin'-2' Digital Computer"

Tr. Tambov. in-ta khim. mashinostr. (Works of the Tambov Institute of Chemical Machine Building), 1971, vyp. 6, pp 137-140 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 10, Oct 71, Abstract No 10B442)

Translation: The paper describes a simplified block diagram of a device for automatically feeding information presented in frequency-pulse form into the "Promin'-2" digital computer. An experimental check confirmed the efficiency of the device. Two illustrations, bibliography of four titles. V. Kh.

1/1

Pulse Technique

USSR

UDC 621.316.722.1 (088.8)

SOSIN, P.A., FESENKO, B.I.

"Low-Voltage D-C Voltage Regulator"

USSR Author's Certificate No 305543, filed 5 Nov 69, published 21 July 71 (from RZh:Elektronika i yeye primeneniye, No 2, Feb 72, Abstract No 2B470P)

Translation: In order to increase the stabilization factor of a regulator with a series regulating element and pulse width modulation (PWM), a multiplication circuit is introduced, to the input of which pulses are fed from the PWM unit. The capacitance of the capacitors of the multiplication circuit is chosen of a magnitude such that a change of the width of the pulses does not effect the magnitude of the output voltage. After multiplication, the voltage proceeds across a reference stabilitron to the PWM unit and the difference is established between the multiplied voltage and the voltage of the reference stabilitron, which is used as a control signal accomplishing modulation of the pulse width and regulation of the output voltage of the regulator. The minimum magnitude of the output voltage of the regulator in the circuit in question amounts to 1.5 -- 2 v. 1 ill. V.Sh.

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USSR

UDC 547.944/945

FADEYEVA, I. I., PEREL'SON, M. YE., TOLKACHEV, O. N., KIL'DIBEKOVA, T. N., and FESENKO, D. A., All Union Scientific Research Institute of Medicinal Plants

"Stephania Hernandifolia Alkaloids. IX. 3-O-Dimethylhernandifolin"

Tashkent, Khimiya Prirodnykh Soyedinenii, No 1, 1972, pp 130-132

Abstract: A compound was isolated from the methanol fraction of the chromatographic separation on an alumina column of a mixture of alkaloids obtained from Stephania Hernandifolia grass. This compound had mp 148-149° and in contrast to hernandifolin, hernandine and methylhernandine showed a color reaction characteristic of o-diphenols. On the basis of IR and NMR spectroscopic data, it was assigned the structure of 3-O-dimethylhernandifolin.

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USSR

UDC 547(1944/94)

IL'INSKAYA, T. N., PEREL'SON, M. YE., FADEYEVA, I. I., FESENKO, D. A., and TOLKACHEV, O. N., All Union Scientific Research Institute of Medicinal Plants

"Stephania Delovayi Alkaloids. II. 16-Ketodelavaine"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 1, 1972, pp 129-130

Abstract: A new alkaloid was isolated from the Stephania Delovayi Diels (Menispermaceae) grass, with mp 221-222°, $[\alpha]_D$ -180°. This compound showed a positive reaction for the dioxymethylene group. On the basis of UV, IR, and NMR spectroscopic analysis, this compound was claimed to be 16-ketodelavaine.

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USSR

UDC 547.944/945

FADEYEVA, I. I., FESENKO, D. A., IL'INSKAYA, T. N., PEREL'SON, M. YE., and TOLKACHEV, O. N., All- Union Scientific-Research Institute of Medicinal Plants

"Alkaloids of Stephania Hernandifolia. VIII. Methylhernanine"

Tashkent, Khimiya Prirodnykh Soyedineniye, No 4, 1971, pp 455-456

Abstract: This a is a continuation of research begun on alkaloids extracted from the above-ground portion of Stephania hernandifolia.

From the hydrochloride, which is weakly soluble in alcohol, a new alkaloid was extracted with formula $C_{20}H_{27}O_6N$ and melting point 152-153°C (ethanol-ether), which was named methylhernandine. The infrared and magnetic resonance spectra of this substance were obtained.

The alkaloid was finally identified with N-methylamine alcohol, which is obtained in the hydrolysis of hernandifoline.

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USSR

UDC 547.92

FESENKO, D. A., FADEYEVA, I. I., IL'INSKAYA, T. N., PEREL'SON, M. Ye., and TOLKACHEV, O. N., All Union Scientific Research Institute of Medicinal Plants

"Stephania Hernandifolia Alkaloids. VI. Hernandifolin"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 2, 1971, pp 158-164

Abstract: 10 kg of dry Stephania hernandifolia grass was immersed in 10% ammonia, and after decantation extracted with dichloroethane. The extract was treated with 10% sulfuric acid, neutralized with ammonia and extracted with ether, made alkaline (pH 9), and reextracted with chloroform. The extract was dried, concentrated and chromatographed on an alumina column. A mixture of three alkaloids was obtained from the chloroform eluate, and after a triple recrystallization from chloroform 1.2 g of hernandifolin (I) was obtained in the form of an addition product with chloroform, m.p. 227-227.5°.; treatment of this material with ether followed by ammonia gave free (I), m.p. 128-229°, $[\alpha]_D = -25°$. Reacting (I) with acetic anhydride in pyridine, followed by chromatography over alumina produced diacetyl-nernandifolin, m.p. 171-171.5° eluted with methanol. N-Methylhernandifolin was obtained by reacting (I) with methyl iodide. Hydrolysis of (I) in

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FESENKO, D. A., et al., Khimiya Prirodnykh Soyedineniy, No 2, 1971, pp 158-164

alcoholic NaOH followed by treatment with sulfuric acid and finally with ammonia gave hesperitic acid, m.p. 228-229°. The structure assignment was based on the analysis of NMR, IR and mass spectral data.

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USSR

UDC 547.92

NAYDOVICH, L. P., FESENKO, D. A., and ROSTOTSKIY, B. K., All Union Scientific Research Institute of Medicinal Plants

"On Alkaloids of Mahonia Aquafolia"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 6, 1970, p 775

Abstract: Berberine and berbamine were isolated from the roots of the shrub Mahonia aquafolia. Zinc dust reduction of the quaternary alkaloid fraction in acid yielded one phenol base and two nonphenol bases. The phenol base is identified as tetrahydrojatrorrhizine (k,l-corypalmine), and one of the nonphenol bases is identified as d,l-canadine (tetrahydroberberine). The structure of the other nonphenol base is under investigation.

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USSR

UDC 547.92

IL'INSKAYA, T. N., FESENKO, D. A., FADEYEVA, I. I., PEREL'SON, M. Ye., and TOLKACHEV, O.N., All-Union Scientific Research Institute of Medicinal Substances

"Stephania Hernandifolia Alkaloids. VII. Hernandin"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 2, 1971, pp 180-184

Abstract: The chloroform mother liquors of the Stephania hernandifolia extracts left after the removal of hernandifolin was evaporated in vacuum. The tarry residue was treated repeatedly with 10% HCl solution, the combined acid extracts were thoroughly reextracted with chloroform, washed with 10% ammonia solution and water, dried and evaporated. The residue was crystallized from ethanol to yield harnandin, m.p. 197-199°, $[\alpha]_D^{20}$ = -33°. IR, NMR, and mass spectra were studied in an attempt to discover the structure of this product.

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AA0040696 F Fesenko, G.M.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

241947 FORGING METHOD for hollow articles such as pipes. In the conventional methods i.e. by drawing and rolling the elasticity of the metal has to be allowed for. This new methods seeks to draw the article through a multi start threaded nut where the threads reduce to '0' towards the exit thus controlling the metal flow in the cross and longitudinal direction.

27.12.65 as 1045697/25-27. V.S. RUDOY & OTHERS. PIPE RES. & DES. INST. (26.8.69) Bul 14/23.4.69. Class 49h Int.Cl.B 23k.

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10

18

19750320

AA0040696

AUTHORS: Rudoy, V. S.; Cherkasov, N. K.; and Fesenko. G. M.

Vsesoyuznyy Nauchno - Issledovatel'skiy i Konstruktorsko - Tekhnologicheskiy Institut Trubnoy Promyshlennosti

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19750321

Veterinary Medicine

USSR

UDC 636+576.8.094.29

KOVALENKO, Ya. R., SIDOROV, M. A., FESENKO, I. D., FEDOROV, Yu. N.

"Reactogenic and Immunogenic Properties of Cholera Virus Vaccine from the K Strain for Hogs Kept at High Ambient Temperature"

Moscow, Sel'skokhozyaystvennaya Biologiya, Vol 7, No 5, 1972, pp 759-762

Abstract: A study was made of the reactogenic and immunogenic properties of the cholera virus vaccine from the K strain for hogs kept at high ambient temperatures for the period of the adaptive and productive phases of immunogenesis. Under the conditions of high temperatures and humidity, gilts exhibit a standard stress reaction. The live virus vaccine from the K strain injected in these gilts causes a severe postvaccinal reaction, and some of them become sick and die exhibiting clinical and pathoanatomical symptoms characteristic of cholera. A stressed immunity develops in the gilts injected with the live virus vaccine by the fifth day.

A total of three experiments were performed over the course of 3 years on 92 gilts with a live weight from 22 to 45 kg. One group of pigs was kept under the customary conditions of the hoghouse (a temperature of 16-22°, a relative humidity of 75-85%, air movement at 0.1 m/sec, a carbon dioxide gas content of 0.22-0.23%, and an oxygen content of 20.8-20.85%); another group

USSR

KOVALENKO, Ya. R., et al., Sel'skokhozyaystvennaya Biologiya, Vol 1, No 5, 1972, pp 759-762

of the same age which had previously been kept under the same conditions was moved to the climate chamber 3 days before vaccination and for 7 days after injection of the vaccine they were kept in it 8 hours a day and then in the hoghouse. In the climate chamber at a level of 30 cm from the floor the temperature was maintained at 30-32°C with air circulation of 0.15 m/sec and a relative humidity of 75-90%. At night when the heaters were shut down the temperature dropped to 22-25°C for 5 hours, the relative humidity reached 95-100%, and the carbon dioxide gas concentration in the daytime did not exceed 0.25% and at night 0.32% with an oxygen content of 20.81 to 20.71%. Comparative data are tabulated for the different groups of gilts. As a result of the stressed state arising from the increased temperature and humidity, the phagocytic activity of the blood neutrophils of the pigs dropped, the synthesis of specific globulins was suppressed, and the overall resistance of the organism was lowered. Against this background, the reactogenic property of the live virus vaccine from the lapinized K strain is intensified, and individual series of this vaccine caused postvaccinal cholera and death in the animals. The intensified prolipheration of the cells in the lymphatic series with intense synthesis of ribonucleic acid caused by the high temperatures insures rapid

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USSR

KOVALENKO, Ya. R., et al., Sel'skokhozyaystvennaya Biologiya, Vol 1, No 5, 1972, pp 759-762

penetration and reproduction of the lapinized cholera virus in the organism of the gilts. This promotes the manifestation of the reactogenic property and the creation of a stressed immunity.

USSR

UDC 636:612

KOVALENKO, Ya. R., SIDOROV, M. A., TATARINTSEV, N. T., FESENKO, I. D., and SHEGIDEVICH, E. A., All Union Institute of Experimental Veterinary Science, Moscow

"The Effect of Elevated Temperature and Humidity of the Environment on Immunogenesis of Swine Infected With Erysipelas"

Moscow, Sel'skokhozyaystvennaya Biologiya, Vol 6, No 4, 1971, pp 591-596

Abstract: Two series of tests were carried out on swine of various weights. One group was kept in normal pigsty conditions at 15-20°C and relative humidity of 75-80%. The other group of similar swine were kept for three days prior to vaccination and for seven days thereafter in a climatic chamber, then transferred to the pigsty. Electric heaters, operating for eight hours daily, produced a temperature of up to 30-32°C, the air was circulated by ventilators, at a velocity of 0.15 m/sec, with a relative humidity of 75-90%. At night the temperature dropped to 22-25°C with humidity of 95-100%. Eighty-three piglets were used in two tests, vaccinated with live erysipelas vaccine strain VR-2. It was demonstrated that in swine kept under conditions of elevated temperature and humidity, the synthesis of protein fractions undergoes a change, the

USSR

KOVALENKO, Ya., R., et al, Sel'skokhozyaystvennaya Biologiya, Vol 6, No 4, 1971, pp 591-595

phagocytic activity of the blood neutrophils is markedly depressed, nucleic acid synthesis is altered, and the transformation of the blastic elements of lymph tissue into plasmatic ones is retarded. All of this affects the synthesis of specific antibodies. It was determined that elevated temperature and humidity, which produce significant hematological, cytological, and biochemical shifts in the body of swine, are factors which prevent the formation of intense postvaccinal immunity to erysipelas when live VR-2 strain vaccine is used. The surrounding medium and microclimate can have a negative effect on the condition of the swine as stress factors, or be direct causes of disease. Therefore, when measures are being carried out for eradication of swine erysipelas, the effectiveness of vaccination of piglets kept under conditions of elevated temperature and humidity may decline markedly and many of the vaccinated animals fail to acquire any stable immunity.

2/2

USSR

UDC: 622.243.144.4

SACHKOV, V. V., KHARIV, I. Yu., TITARENKO, N. Kh., FESENKO, N. N., YAREMENKO, V. A., Poltava Division of Ukrainian Scientific Research Institute for Geological Prospecting

"Ultrasonic Treatment of Drilling Solution in Order to Restore its Structural and Mechanical Properties"

Moscow, Bureniye, No 7, 1973, pp 18-21.

Abstract: A method is studied for restoration of the structural and mechanical properties of solutions by ultrasonic treatment, allowing the restoration of lost properties to be accelerated, while reducing the consumption of materials and expenditures of labor, particularly manual labor, related to the preparation of chemical reagents and treatment of the solution with the reagents. Results are presented from restoration and improvement of these properties during ultrasonic processing directly at drilling sites. The mechanism of action of the ultrasound on natural and artificial solutions is described. The Institute has developed several designs of hydrodynamic vortex-type radiators for production ultrasonic treatment of solutions. These radiators are simple in design and reliable in operation. They can be driven by either centrifugal or piston-type pumps. The mechanism of action of the ultrasound consists in effective

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USSR

Sachkov, V. V., Kahriv, I. Yu., Titarenko, N. Kh., Fesenko, N. N., Yaremenko, V. A., Moscow, Bureniye, No 7, 1972, pp 18-21.

dispersion of particles of clay materials, increasing their number per unit volume and thus increasing the surface of the active solid phase and forming a better developed, stronger coagulation structure in the solutions.

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Rare Metals

USSR

UDC: 669.018.4:536.422

GORDIYENKO, S. P., FENOCHKA, B. V., FESENKO, V. V.

"Rare Earth Metals and Their Refractory Compounds"

Redkozemel'nyye Metally i Ikh Tugoplavkiye Soyedineniya, Kiev, Naukova Dumka Press, 1971, 168 pp.

Translation of Introduction: Of the 170-year history of the study of the rare earth elements, over 100 years were dedicated by the world's chemists to the discovery and separation of the individual elements. The works of Russian scientists, particularly of D. I. Mendeleyev, who predicted trivalence, the atomic weight and many other physical and chemical properties of the rare earth elements, have been significant in these studies.

At the present time, our country has everything necessary (raw materials, methods of purification, separation and production control) for the creation of a well-developed rare earth element industry. The primary problem is discovery of new areas of application of the rare earth elements, their alloys and compounds.

We must note that the rare earth metals, and particularly their refractory compounds--oxides, carbides, borides, sulfides and phosphides, with melting points of up to 2500-2800°K, are promising materials for various areas of new technology.

In the literature, methods for production of refractory compounds have been presented, and their structural and electrical properties have been studied.

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USSR

Gordiyenko, S. P., Fenochka, B. V., Fesenko, V. V., Redkozemel'nyye Metally i Ikh Tugoplavkiye Soyedineniya, Kiev, Naukova Dumka Press, 1971, 168 pp.

However, information on such properties as the evaporation rate, composition and pressure of vapor, necessary for determination of the optimal modes of utilization of rare earth metals and refractory compounds, are scattered through a number of sources.

In addition to the data required to determine evaporation losses, studies of the evaporation of rare earth metals and their refractory compounds allow us to determine the basic thermodynamic properties of these substances at high temperatures. In turn, knowledge of these properties allows us to determine the directions of high temperature processes involving rare earth metals and their refractory compounds, which is necessary for the solution of problems of high temperature chemistry and technology.

Establishment of the correlations of thermodynamic characteristics of rare earth metals and their compounds with the peculiarities of the electron structure of the lanthanides (the presence of deep 4f shells, tending toward stable f^7 and f^{14} configurations) is of particular interest.

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USSR

Gordiyenko, S. P., Fenochka, B. V., Fesenko, V. V., Redkozemel'nyye Metally i Ikh Tugoplavkiye Soyedineniya, Kiev, Naukova Dumka Press, 1971, 168 pp.

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Gordiyenko, S. P., Fenochka, B. V., Fesenko, V. V., Redkozemel'nyye Metally i Ikh Tugoplavkiye Soyedineniya, Kiev, Naukova Dumka Press, 1971, 168 pp.

USSR

UDC 546.824-31'42':539.23:537.226

BULGAKOV, N. A., DUDKEVICH, V. P., BONDARENKO, V. S., ZAKHARCHENKO, I. N., and FESENKO, YE. G., Rostov State University

"Structure and Certain Dielectric Properties of Strontium Titanate Thin Films Produced by Cathode Sputtering"

Moscow, Neorganicheskiye Materialy, Vol 9, No 10, Oct 73, pp 1833-1834

Abstract: Strontium titanate (ST) films, 1-12 microns thick, were produced on titanium substrates by cathode sputtering. From this experimental work the optimum mode of ST film formation was selected: 900 v, 80 ma, residual air pressure of 0.6 mm Hg, distance between anode and cathode -- 12 c, distance between cathode and substrate -- 6 mm, and coating rate -- 0.2 micron/hour. It was determined that the dielectric strength of ST films in a constant filed amounts to about 500 kv/cm which is higher than for volume ceramic samples for which this value doesnot exceed 100 kv/cm. One figure, three bibliographic references.

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USSR

UDC: 548.5

[redacted], GAVRILYACHENKO, V. G., SPINKO, R. I., MARTYNENKO, M. A., GRIGOR'YEVA, Ye. A., FERONOV, A. D., Rostov State University

"Growth of Lead Titanate Crystals and Investigation of Their Domain Structure"

Moscow, Kristallografiya, Vol 17, No 1, Jan/Feb 72, pp 153-157

Abstract: A method is described for growing laminar $PbTiO_3$ crystals in the $PbO-TiO_2-B_2O_3$ system, and the results of a study of the domain structure by the optical method and the method of etching are presented. In numerous experiments on crystal growing in this system, it was found that lead titanate sometimes crystallizes in the form of transparent plane-parallel plates with a perfect {100} face. Experiments showed that the yield of perfect laminar crystals depends on the temperature gradient with respect to height in the melt, and the cooling rate. The optimum conditions are less than

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USSR

FESENKO, Ye. G. et al., Kristallografiya, Jan/Feb 72, pp 153-157

20 deg/hr for the cooling rate, and less than 20 deg/cm for the vertical temperature gradient with an approximate ratio of 1:1 between these parameters. The region of laminar crystal growth is shown by the shaded portion on the phase diagram. It was found that observation of optimum conditions gives fairly large crystals (up to 1.5 cm^2) with thicknesses from 10-15 μ to 1-1.5 mm. The domain structures of the crystals are classified. Etching figures are shown which correspond to 180° domain configurations, as well as to large monodomain regions with stable antiparallel domains in the surface layer. Some of the particulars of the phase transition are discussed. Four figures, bibliography of eighteen titles.

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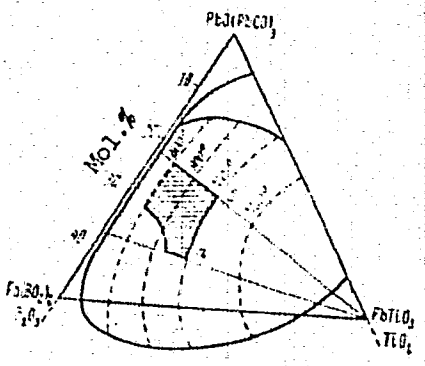
USSR

FESENKO, Ye. G. et al., Kristallografiya, Jan/Feb 72, pp 153-157



Phase diagram of the $PbO-B_2O_3-TiO_2$ system and the region of laminar crystal growth (shaded area)

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1/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--SYNTHESIS AND X RAY STRUCTURAL STUDY OF THE PEROVSKITES BAPBO SUB3 AND SRPBO SUB3 -U-

AUTHOR-(02)-SHUVAYEVA, YE.T., FESENKO, YE.G.

F

COUNTRY OF INFO--USSR

SOURCE--KRISTALLOGRAFIYA 1970, 15(2), 379-80

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, CHEMISTRY

TOPIC TAGS--MINERAL, LEAD OXIDE, X RAY STUDY, BARIUM COMPOUND, STRONTIUM COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0900 STEP NO--UR/0070/70/015/002/0379/0380

CIRC ACCESSION NO--AP0116410

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116410

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TEST SPECIMENS OF BAPBO SUB3 WERE OBTAINED FROM PURE PBO SUB2 AND BAO SUB2 BY THE USUAL CERAMIC PROCEDURE IN AN OXIDIZING ATM. (DECOMPN. OF BAO SUB2) AT 800DEGREES. THE SPECIMENS OF SRPBO SUB3 WERE PREPD. FROM PBO SUB2 AND SRCO SUB3 IN AN O ATM. (2-2.5 ATM O PRESSURE) AT 750 AND 800DEGREES (2ND FIRING). THE DEBYE CRYSTALLOGRAMS OF THE COMPDS. SHOW THAT BOTH COMPDS. HAVE A SINGLE PHASE PEROVSKITE STRUCTURE WITH MONOCLINIC LATTICE DISTORTION: BAPBO SUB3: A EQUALS C EQUALS 4.24 SUB6 ANGSTROM, B EQUALS 4.22 SUB7 ANGSTROM; BETA EQUALS 90DEGREES 19 PRIME; SRPBO SUB3: A EQUALS C EQUALS 4.17 SUB6 ANGSTROM, B EQUALS 4.16 SUB6 ANGSTROM; BETA EQUALS 90DEGREES 53 PRIME. THE TEMP. DEPENDENCE CURVE OF THE LATTICE PARAMETERS OF SRPBO SUB3 SHOWS THAT THE TRANSITION INTO THE CUBIC PHASE TAKES PLACE AT SIMILAR TO 800DEGREES. THE TRANSITION OF BAPBO SUB3 INTO THE CUBIC PHASE TAKES PLACE AT SIMILAR TO 400DEGREES. FACILITY: ROSTOV. GOS. UNIV., ROSTOV, USSR.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--SPONTANEOUS POLARIZATION AND COERCIVE FIELD OF LEAD TITANATE -U-

AUTHOR-(04)-GAVRILYACHENKO, V.G., SPINKO, R.I., MARTYNENKO, M.A., FESENKO, YE.G.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(5), 1532-4

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--LEAD COMPOUND, TITANATE, ELECTRODE, CURIE POINT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0161 STEP NO--UR/0181/70/012/005/1532/1534

CIRC ACCESSION NO--AP0129417

UNCLASSIFIED

2/2 015 UNCLASSIFIED

CIRC ACCESSION NO--AP0129417 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SPONTANEOUS POLARIZATION, P SUBS EQUALS 75 MICROCOULOMBS-CM PRIME2 AND THE COERCIVE FIELD, E SUBO EQUALS 6.75 KV-CM. ON REPOLARIZATION IN STRONG FIELDS, ALPHS DOMAINS ARE FORMED, WHICH SPREAD PROGRESSIVELY OVER THE ENTIRE SURFACE OF THE ELCTRODE. THE TEMP. DEPENDENCE OF SPONTANEOUS POLARIZATION SHOWS THAT WITH INCREASING HEATING, P SUBS DECREASES MONOTONICALLY TO SIMILAR TO 50PERCENT OF ITS VALUE AT ROOM TEMP., AND AT THE CURIE POINT THE JUMP IS 40 MICROCOULOMBS-CM PRIME2.

FACILITY: ROSTOV.-NA-DONU GOS. UNIV., ROSTOVON DON, USSR.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--SYNTHESIS AND DETERMINATION OF THE LATTICE PARAMETERS OF NEW OXIDES OF COMPLEX COMPOSITION WITH PEROVSKITE STRUCTURE -U-

AUTHOR-(05)-FILIPYEV, V.S., FESENKO, YE.G., DEVLIKANOVA, R.U., ZHAVORONKO, G.P., SHVOM, YE.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(1), 179-81

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--MINERAL, OXIDE, CRYSTAL LATTICE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0148 STEP NO--UR/0363/70/006/001/0179/0181

CIRC ACCESSION NO--AP0054944

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054944

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE COMPOS. CA SUB3 TA SUB2 COO SUB9 AND CA SUB3 TA SUB2 CAO SUB9 (CA SUB4 TA SUB2 O SUB9), A NEW TYPE OF PEROVSKITE LATTICE DISTORTION WAS OBSD. IN CONTRAST TO THE KNOWN TRICLINIC DISTORTION, THE PEROVSKITE LATTICE OF THESE COMPOS. IS OBTAINED FROM A SUPPLEMENTARY MONOCLINIC DISPLACEMENT ALONG THE LONG DIAGONAL OF THE BASE.

UNCLASSIFIED

Acc. Nr: AP0045093

Abstracting Service: 5/70 INTERNAT. AEROSPACE ABST.

Ref. Code: UR0026

A70-23121 # Conditions for life in the universe (Usloviia zhizni vo vselennoi). V. G. Fesenkov (Akademiia Nauk SSSR, Komitet po Meteoritam, Moscow, USSR). *Priroda*, no. 1, 1970, p. 20-27. In Russian.

Analysis of the different evolutionary stages of matter in the universe in order to determine those steps which produce complex organic compounds. The changes which affect (with the passage of time) the conditions accompanying the origin of these complex compounds are also examined. The ejection of matter from galactic nuclei and from stars is investigated, together with the interaction between this matter and cosmic radiation. Attention is given to the composition and orbits of comets as likely sources of organic compounds in the solar system.

T.M.

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REEL/FRAME 19772006

2

1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--POSSIBILITY OF USING LUNAR ECLIPSES FOR SOUNDING ATMOSPHERIC OPTICAL PROPERTIES -U-
AUTHOR--FESENKOV, V.G.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, ASTRONOMICHESKIY ZHURNAL, VOL 47, NR 2, 1970, PP 237-245

DATE PUBLISHED--------70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS, ATMOSPHERIC SCIENCES

TOPIC TAGS--LUNAR ECLIPSE, ATMOSPHERIC OPTICS, SOLAR DISC, ATMOSPHERIC SOUNDING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0112 STEP NO--UR/0033/70/047/002/0237/0245

CIRC ACCESSION NO--AP0125930
UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0125930
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ALTHOUGH IT MIGHT BE DOUBTED THAT THE OPTICAL PROPERTIES OF THE ATMOSPHERE CAN BE SOUNDED BY AN ANALYSIS OF LUNAR ECLIPSES, SINCE THE ANGULAR DIMENSIONS OF THE ATMOSPHERIC EFFECTIVE LAYER VISIBLE FROM THE DISTANCE OF THE MOON ARE NEGLIGIBLE IN COMPARISON WITH SIZE OF THE SOLAR DISK, NEVERTHELESS, AS SHOWN HERE, A DETAILED EXAMINATION OF THIS PROBLEM REVEALS THE SUITABILITY OF THIS METHOD. IN THE LUNAR ECLIPSE PHENOMENON THE MAJOR ROLE IS PLAYED BY REFRACTIONAL DISPERSION, EQUIVALENT TO APPARENT FLATTENING OF THE SOLAR DISK, OCCURRING WITHOUT CHANGES IN ITS APPARENT BRIGHTNESS. FOR A COMPLETE INTERPRETATION OF A LUNAR ECLIPSE IT IS NECESSARY TO TAKE INTO ACCOUNT OZONE ABSORPTION AND GAS AEROSOL EXTINCTION IN THE EARTH'S ATMOSPHERE, AS WELL AS THE INTENSITY DISTRIBUTION OVER THE SOLAR DISK. THE COMPUTATIONS GIVEN HERE REVEAL THAT EVEN WITH A SMALL CHANGE IN THE DISTRIBUTION OF ATMOSPHERIC OPTICAL PROPERTIES AT DIFFERENT ALTITUDES THE PHOTOMETRIC CHARACTERISTICS OF A LUNAR ECLIPSE CHANGE CONSIDERABLY, PARTICULARLY WHEN THE SUN IS LOW. IT IS CLEAR THAT EVEN RELATIVELY SMALL OPTICAL INHOMOGENEITIES, SUCH AS A THIN LAYER OF COSMIC DUST AT AN ALTITUDE OF ABOUT 100 KM, CAN BE DETECTED IN SUCH A WAY. WITH SUCH A CHANGE IN ATMOSPHERIC OPTICAL PROPERTIES THERE IS A CONSIDERABLE CHANGE IN SIZE OF THE SHADOW, AND THIS CAN BE EASILY DETERMINED. BY DETERMINING THE BRIGHTNESS OF A LUNAR ECLIPSE IT IS EASY TO FIND WHAT REGIONS OF THE EARTH'S ATMOSPHERE CAUSE CORRESPONDING CHANGES IN ILLUMINATION AND THEREBY DETERMINE THEIR OPTICAL PROPERTIES AT DIFFERENT ALTITUDES.

UNCLASSIFIED

USSR

UDC 627.8.05:622.235

AZARKOVICH, A. YE., FESHCHENKO, A. A.

"Selecting Explosives for Special Forms of Explosive Operations in Hydro-engineering Construction"

Energ. str-vo -- V Sb. (Power Engineering Construction -- Collection of Works), No 10 (112), Moscow, 1970, pp 53-56 (from RZh-Elektrotekhnika i Energetika, No 2, Feb 71, Abstract No 2 D197)

Translation: The effect of the type of explosives on preservation of the rock surfaces of excavations is investigated. The selection of the explosives is based both on technical and economic factors. There are 2 tables and a 4-entry bibliography.

1/1

USSR

UDC 577.3

FESENKO, Ye. Ye., KULAKOV, V. N., LYUBARSKIY, A. L., and VOL'KENSHTEYN, M. V.

"Three-Phase Kinetics of the Recombination of Myoglobin With Carbon Monoxide at Low Temperature"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 2, 1972, pp 485-487

Abstract: A study of the recombination of myoglobin (Mb) with CO after photodissociation showed that the reaction proceeded via three pathways. These were designated as very fast, fast, and slow reactions. The energy, the entropy, and the enthalpy of activation were calculated for each reaction in both glycerine and a water-glycerine mixture. The rate constant and relative rates of reaction are given for selected temperatures between -100°C and 0°C. Conformational shifts in $Mb \cdot C_O$ complexes were described.

USSR

UDC: 621.317.733

BULNITSKAYA, Ye. A., NOVIK, A. I., SMOLYAR, Yu. A., TUCHIN, R. D., FESHCHENKO, N. A., KHAZANOV, V. M.

"Some Circuits for Temperature Compensation of AC Bridges"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 1 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 1), Novosibirsk, 1970, pp 19-21 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A351)

Translation: The authors discuss the general principles of temperature compensation of AC bridges. A simplified transformer bridge circuit with temperature compensation of the reference specimen is given by way of example. Two illustrations. N. S.

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USSR UDC 547.26'11

MARCHENKO, A. P., PINCHUK, A. M., and FESHCHENKO, N. G., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Tris(N-alkyl-N-phenyl)amides of Phosphoric Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, pp 1900-1903

Abstract: Tris(N-methyl-N-phenyl)- and tris(N-ethyl-N-phenyl)amides of phosphoric acid (I) and (II) were synthesized by reacting a mixture of 50 ml ether, 0.105 g-mole of phosphorus trichloride and 0.4 g-mole of triethylamine at 0° stirred in a stream of argon with a solution of 0.35 g-mole of methylaniline in 150 ml ether. The mixture is refluxed for 3-4 hrs, cooled to 10°, the precipitate is separated, mixed with 300 ml chloroform, cooled to 10° and the product is crystallized from chloroform. It was shown that the (I) and (II) described in previous literature are actually N,N'-dimethyl-N,N',N"-triphenyltriamide of phosphoric acid, its N,N'-diethyl homologue and N-ethyl-N,N',N"-triphenyltriamide of phosphoric acid.

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USSR

UDC 661.184

YAROSHENKO, N. A., DEMCHENKO, P. A., FESHCHENKO, N. G., and IRODIONOVA, A. F., Institute of the Chemistry of High-Molecular Compounds, Academy of Sciences UkrSSR, and Institute of Organic Chemistry, Academy of Sciences UkrSSR

"The Surface Activity of Alkylphosphonic Acids and of Their Sodium Salts in Aqueous Solutions at Various Temperatures"

Kiev, Ukrainskiy Khimicheskiy Zhurnal, Vol 19, No 9, Sep 73, pp 895-899

Abstract: The isotherms in the 20-90° range of the surface tension of aqueous solutions of the alkylphosphonic acids $RP(O)(OH)_2$ ($R = C_8$, C_9, C_{10}, C_{12}, C_{16}) at various concentrations and also of their acidic and neutral Na salts were determined. The neutral and acidic salts had a surface activity that was twice as high and five-six times as high, respectively, as that of Na salts of alkylcarboxylic acids RCOOH ($R = C_8$-C_{16}). The surface activity increased in the order $RP(O)(ONa)_2 < RP(O)(OH)ONa < RP(O)(OH)_2$. The tendency of the last two members of this series to form intermolecular hydrogen bonds increased their surface activity. Because of the more pronounced metallic characteristics of P as compared with C or S, the compounds $RP(O)(OH)_2$ and $RP(O)(OH)ONa$ had a high surface activity which decreased to a relatively slight extent with increasing temperatures of their solutions. This decrease was particularly small for $R = C_{12} - C_{16}$ and became somewhat greater for $R = C_8 - C_{10}$.

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USSR UDC 535.34:543.42:541.8

BOLDESKUL, I. YE., YEGOROV, YU. P., MAKOVETSKIY, YU. P., RYL'TSEV, YE. V., and FESHCHENKO, N. G., Institute of Organic Chemistry, Academy of Sciences USSR, Kiev

"Spectroscopical Investigation of the Reaction Mechanism of Phosphonium Salts with Carboxylic Acids in Solutions"

Kiyev, Teoreticheskaya i Eksperimental'naya Khimiya, Vol 9, No 3, May-Jun 73, pp 350-356

Abstract: Intermolecular reactions of quaternary phosphonium salts $(C_8H_{17})_4P^+Hal^-$ ($Hal^- = I^-, Br^-, Cl^-$) with proton donors stronger than alcohols -- the carboxylic acids (RCOOH, R = CH_3, CCl_3, CF_3) were investigated in CCl_4 solutions by means of IR spectroscopy. It has been shown that the reaction occurs through the formation of a complex with the H-bond, and that it is irreversible. A mechanism for this reaction has been proposed, according to which a halide anion of the salt is exchanged for a carboxylate anion. Since the rate of this process is symbatic with the proton donating 1/2

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BOLDESKUL, I. YE., et al., Teoreticheskaya i Eksperimental'naya Khimiya, Vol 9, No 3, May-Jun 73, pp 350-356

properties of these acids and with the proton accepting properties of the salt H-bonds, it seems reasonable that the H-bond formation is the first stage of this reaction.

2/2

USSR UDC 547.245

PINCHUK, A. M., GORBATENKO, Zh. K., and FESHCHENKO, N. G., Institute of Organic Chemistry, Acad. Sc. Ukrainian SSR

"Reaction of Phosphorus Triiodide With Morpholyltrimethylsilane"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 8, Aug 73, p 1855

Abstract: To a suspension of 0.02 g-mole of PI_3 in 50 ml benzene, 0.02 g-mole of morpholyltrimethylsilane in 10 ml benzene was added with stirring. The reaction mixture was then refluxed for 1 hr, filtered, and after evaporation of solvents the morpholyldiiodophosphine was obtained in quantitative yield, m.p. -43 to -40°. When the reagent ratio was 1:2 of PI_3 to morpholyltrimethylsilane, the product was the dimorpholyliodophosphine, m.p. 102-104°.

USSR

UDC 546.152+546.185

KOSTINA, V. G., FESHCHENKO, N. G., and KIRSANOV, A. V.

"Phosphorus Oxyiodide, POI_3"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, p 209

Abstract: Phosphorus oxyiodide was obtained by the interaction of alkoxydiiodophosphines (N. G. Feshchenko, et al., ZhOKH, Vol 43, No 1, 1973) with iodine in carbon tetrachloride or hexane

$$AlkOPI_2 + I_2 \longrightarrow [AlkOPI_4] \longrightarrow AlkI + POI_3$$

The physical and chemical properties of the material are described. Phosphorus oxyiodide was also obtained with a yield of about 16% of interaction of phosphorus oxychloride with lithium iodide in a benzene solution.

On interaction of alkoxydiiodophosphines with iodine in the absence of solvents, ethyl and propyl iodides were isolated and identified with yields of 81.8 and 82%; the yields of phosphorus oxiiodide in these cases are almost quantitative, but the product is contaiminated with iodine and has a low melting point. The yield of the phosphorus oxyiodide is about 85% in the product.

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USSR

UDC 547.26'118

FESHCHENKO, N. G., KOSTINA, V. G., and KIRSANOV, A. V.

"Aroxy and Alkoxydiiodo Phosphines"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 209-210

Abstract: Aroxy and alkoxydiiodo phosphines were synthesized by the interaction of solutions of aroxy and alkoxy dichlorophosphines with lithium iodide in carbon tetrachloride or hexane at -10 to -20°.

$$ROPCl_2 + 2LiI \longrightarrow ROPI_2 + 2LiCl$$

The aroxy and alkoxy diiodophosphines are light yellow or light brown liquids which fume in the air, are stable at -50 to -60° in the absence of oxygen, decompose very slowly at -20° and very rapidly at 0°.

An experimental procedure for obtaining the two compounds is given.

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USSR

UDC 541.579

YEGOROV, Yu. P., KATOLICHENKO, V. I., BOROVIKOV, Yu. Ya., FESHCHENKO, N. G., and SEMENIY, V. Ya., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR, Kiev

"Dipole Moments of Phosphorus Acids Derivatives"

Kiev, Teoreticheskaya i Eksperimental'naya Khimiya, Vol 8, No 6, 1972, pp 761-769

Abstract: The dipole moments (μ) of trialkylphosphines, trialkylphosphine oxides, and esters of phosphorus acids were measured. The electron density and stereochemistry are examined. The precise value of μ for these molecules permitted a new value for the moments of the P-X bonds (X=$C_{sp}2^+$, $C_{sp}3^+$, O^-, Alk^+, $=O^-$, Cl^+, F^+) to be calculated. The data are given in two tables which show the interrelationships among the measured parameters and the literature values.

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USSR

UDC 547.241

FESHCHENKO, N. G., MAZEPA, I. K., ZHILA, S. I., and KIRSANOV, A. V.,
Institute of Organic Chemistry, Ukrainian Academy of Sciences

"Hexaalkyliodobiphosphonium Pentaiodides"

Leningrad, Zhurnal Obschey Khimii, Vol 41, No 11, Nov 1971, pp 2,375-2,378

Abstract: The highly reactive hexaalkyliodobiphosphonium pentadioxides (I), formed during alkylation of phosphorus diiodide or of red phosphorus in the presence of iodine, are not well known. The authors tested the reactions of compounds (I) with a number of substances: water, alcohols, phenetole, diisopropyl and dibutyl ethers, tetrahydrofuran, and tricyclohexylphosphine. It was concluded that compounds (I) are very reactive both toward electrophilic (sulfur) and with nucleophilic (metals, water, alcohols, trialkylphosphines) agents.

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UDC 547.558.1

FESHCHENKO, N. G., KOVALEVA, T. V., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences of the UkrSSR

"Iodides of Phosphorus. V. Chemical Properties of Aryldiiodophosphines and Diaryldiiodobiphosphines"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(103), No 2, Feb 72, pp 287-290

Abstract: A study of the chemical properties of aryldiiodophosphines and diaryldiiodobiphosphines shows that both types of compounds react equally readily with electrophilic and nucleophilic agents. Diaryldiiodobiphosphines react with sulfur either producing compounds of a new type -- diaryldiiodobiphosphine disulfides -- or by breaking the P-P bond and forming dithiophosphonic acid anhydride, depending on the conditions under which the reaction is carried out. In boiling benzene, aryldiiodophosphines take up 2 gram-atoms of sulfur and eliminate a mole of iodine molecule. Aryltetraiodophosphorans appear to have the structure of aryltriiodophosphonium iodides. Diphenyldiiodobiphosphine reacts with piperidine with rupture of the P-P bond and formation of the dipiperidide of phenylphosphonous acid. When heated above 230°C, diaryldiiodophosphines decompose with the formation of aryldiiodophosphine and an arylphosphorus polymer.

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USSR

UDC 546.183

FESHCHENKO, N. G., GORBATENKO, Zh. T., KOVALEVA, T. V., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences of the UkrSSR

"Iodides of Phosphorus. IV. Reaction of Phosphorus Triiodide With Organic Sulfides and Tertiary Amines"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(103), No 2, Feb 72, pp 284-287

Abstract: An investigation of the reaction between phosphorus triiodide, organic sulfides and tertiary amines shows that equilibrium conversion of the triiodide to the diiodide takes place when phosphorus triiodide is treated with dialkyl sulfides or thiophane. Because of their low basicity, dibenzyl sulfide and diphenyl sulfide do not convert the triiodide to the diiodide. When phosphorus triiodide reacts with tertiary amines, polymers with a low iodine content are formed. Treatment of the triiodide with pyridine produces the diiodide and a complex comprised of two molecules of pyridine and one molecule of phosphorus triiodide. Aryldiiodophosphines react with triethylamine in a 1:1 ratio to form an almost quantitative yield of diaryldiiodobiphosphines. Cyclic polyarylcyclopolyphosphines are produced by the reaction of aryldiiodophosphines and diaryldiiodobiphosphines with excess triethylamine.

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USSR

UDC: 547.341.07

FESHCHENKO, N. G., KOROL', A. I., KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences of the Ukrainian SSR

"A Method of Synthesizing Tri-(sec-octyl)-phosphine Oxide"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 14, May 71, Author's Certificate No 301337, Division C, filed 24 Feb 70, published 21 Apr 71, p 67

Translation: This Author's Certificate introduces: 1. A method of synthesizing tri-(sec-octyl)-phosphine oxide. As a distinguishing feature of the patent, secondary octyl iodide is treated with phosphorus in the presence of a catalytic quantity of iodine with heating, followed by treating the resultant product with an alkali such as sodium hydroxide, and with sodium sulfite, and isolating the product by conventional methods. 2. A modification of this method is distinguished by heating to 210°C.

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USSR UDC 546.183

FESHCHENKO, N. G., GORBATENKO, Zh. K., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Phosphorus Iodides. III. Reaction of Phosphorus Triiodide With Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 551-554

Abstract: Simple dialkyl esters react with phosphorus triiodide in an equilibrium type reaction to give phosphorus diiodide. At 20° diphenyl ether and anisol convert phosphorus triiodide to the diiodide only to the extent of 1-3% regardless of the reaction time, probably because of low nucleophilicity. Phenetol, dibenzyl ether, and tetrahydrofurane react with phosphorus triiodide both at 20° and 100° forming phosphorus diiodide and alkyl iodides derived from split ethers. This reaction may be used as a preparative method for benzyl iodide and 1,4-diiodobutane. Prolonged heating in vacuum leads to the interconversion of PI_3 and P_2I_4, producing iodine and various byproducts with lower iodine content.

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USSR

UDC: 547.241

FESHCHENKO, N. G., KOVAL', A. A., KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences of the Ukrainian SSR

"Alkyl-Chloride and Alkyl-Bromide Alkylation of Red Phosphorus"

Leningrad, Zhurnal Obshchey Khimii, Vol 40 (102), No 11, Nov 70, pp 2385-2387

Abstract: The authors investigate the reaction of octyl and decyl chlorides, and of hexyl, octyl, decyl and dodecyl bromides with red phosphorus in the presence of iodine. Tertiary phosphine oxides, and phosphinic and phosphonic acids are isolated after treating the reaction products with alkali. The basic reaction products are tertiary phosphine oxides. The situation is reversed by adding phosphoric acid to the reagents, which makes phosphinic and phosphonic acids the basic reaction products with a reduction in oxide yield to 5-15%. Thus the alkylation reaction can be used to synthesize both tertiary phosphine oxides and phosphinic and phosphonic acids.

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USSR

UDC 547.26'127

BOROVIKOV, YU. YA., RYL'TSEV, YE. V., BOLDESKUL, I. YE., FESHCHENKO, N. G., MAKOVETSKIY, YU. P., YEGOROV, YU. P., Institute of Organic Chemistry, Kiev, Academy of Sciences Ukrainian SSR

"Dielkometric Study of Trialkylphosphine Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 1957-1962

Abstract: A study of the interaction between the molecules of trialkylphosphine oxides and their analogues in solutions by the method of dielectric permeability is reported. Trialkylphosphine oxides, trioctylphosphine sulfide, -selenide, -telluride and tetraalkylphosphine iodide were investigated. It was determined that the dipole moments and atomic polarizations of the trialkylphosphine oxides depend on the length of the hydrocarbon chain. The dipole moments of trioctylphosphine oxide, -sulfide, -selenide, and -telluride were identical within experimental error. Trioctylphosphine oxide and tetraoctylphosphine iodide are associated according to the antiparallel type in solvents of low dielectric

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BOROVIKOV, YU. YA., et al, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 1957-1962

permeability. The degree of association of trioctylphosphine oxide is higher in carbon tetrachloride than in benzene, and in chlorobenzene, trifluorobenzene, and acetone it is monomeric. The association of tetraoctylphosphine iodide persists even in solvents with high ε; their dipole moments are close to values corresponding to complete charge transfer from P to I.

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USSR

UDC: 547.241'546.221.07

MAZEPA, I. K., FESHCHENKO, N. G., KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences of the Ukrainian SSR

"A Method of Producing Trialkylphosphine Sulfides"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 26, 1970, Soviet Patent No 270691, Class 12, filed 11 Jun 69, p 24

Abstract: This Author's Certificate introduces: 1. A method of producing trialkylphosphine sulfides. As a distinguishing feature of the patent, the process is simplified by interacting alkyl iodide with red phosphorus with the application of heat in the presence of iodine followed by sulfur treatment of the reaction mass and isolation of the goal product by conventional methods. 2. A modification of this method distinguished by the fact that the process is carried out at the boiling point of the reaction mixture.

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USSR UDC: 546.185

FESHCHENKO, N. G., KOVALEVA, T. V., and KIRSANOV, A. V., Institute of Organic Chemistry, Kiev, Academy of Sciences Ukrainian SSR

"Dialkyl Amidotetraiodophosphorus Compounds"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 2, Feb 70, p 500

Abstract: Lithium iodide reacts with dialkylamidodichlorophoshines to give previously unknown dialkyl amidotetraiodophosphorus compounds and lithium chloride-tetraalkyldiamidodiiodobiphosphine complexes.

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Acc. Nr. AP0041852 Abstracting Service: CHEMICAL ABST. 4173 Ref. Code 4R0366

89921h Benzal iodide. Feshchenko, N. G.; Kondratenko, N. V.; Yagupol'skii, L. M.; Kiesanov, A. I. (Inst. Org. Khim., Kiev, USSR). *Zh. Org. Khim.* 1970, 6(1), 191 (Russ). Refluxing a mixt. of PhCHO and P_2I_4 in C_6H_6 gave $PhCHI_2$. Similarly, 3-$FC_6H_4CHI_2$ and 4-$FC_6H_4CHI_2$ were prepd. The compds. decomp. rapidly in storage. Heating $PhCHI_2$ with 4-$O_2NC_6H_4NHNH_2$ gave $PhCH{:}NNC_6H_4NO_2$-4. CPJR

REEL/FRAME
19751733

1/3 012 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--ALKYLATION OF PHOSPHORUS DIIODIDE AND RED PHOSPHORUS -U-

AUTHOR-(04)-FESHCHENKO, N.G., IRODIONOVA, L.F., KOROL, O.I., KIRSANOV, A.V.

COUNTRY OF INFO--USSR

F

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(4), 773-6

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ALKYLATION, PHOSPHORUS, IODINE, IODINATED ORGANIC COMPOUND, ORGANIC PHOSPHORUS COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1362 STEP NO--UR/0079/70/040/004/0773/0776

CIRC ACCESSION NO--AP0128765

UNCLASSIFIED

2/3 012 UNCLASSIFIED

CIRC ACCESSION NO--AP0128765 PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LOWER ALCS. (C SUB3-5) REACT WITH RED P AND IODINE IN 1:1.2:3 RATIO AT ELEVATED TEMP. WITHOUT PRESSURE MUCH MORE RAPIDLY THAN THE ALKYL IODIDES WITH SAME RADICALS REACT WITH P SUB2 I SUB4 OR P SUB4 I SUB2. AFTER ALK. TREATMENT THE REACTION MIXTS. YIELD TERTIARY PHOSPHINE OXIDES, AND PHOSPHONIC AND PHOSPHINIC ACIDS. ALKYL IODIDES IN THE PRESENCE OF H SUB3 PO SUB4 REACT WITH P AND IODINE OR WITH P SUB2 I SUB4 JUST AS DO THE CORRESPONDING ALCS. THE MIXED ROH AND IODINE IN THE ABOVE RATIO WERE TREATED WITH RED P AT SMALLER THAN 70DEGREES, THEN REFLUXED UNTIL CONDENSATION OF RI CEASED IN THE REFLUX CONDENSER AND AFTER TREATMENT WITH 20PERCENT NAOH AND EXTN. WITH C SUB6 H SUB6 GAVE IN THE ORG. LAYER THE REQUISITE R SUB3 PO; THE ALK. LAYER GAVE ON ACIDIFICATION THE APPROPRIATE ACIDS. THE FOLLOWING YIELDS OF INDICATED PRODUCTS WERE OBTAINED AFTER REACTION (HR DURATION IN PARENTHESES) OF THE ALCS. WITH INDICATED RADICALS: PR (40-4) 50.3PERCENT R SUB3 PO AND 32-7PERCENT R SUB2 PO SUB2 H; BU (12), 43PERCENT R SUB3 PO, 45PERCENT R SUB2 PO SUB2 H; C SUB5 H SUB11 94-5) 43PERCENT R SUB3 PO, 41PERCENT RPO SUB3 H SUB2; ISO-C SUB5 H SUB11 (4-5), 32PERCENT R SUB3 PO AND 50PERCENT RPO SUB3 H SUB2; CYCLO-C SUB6 H SUB11 (4) 80PERCENT R SUB3 PO; AND PHCH SUB2 CH SUB2, 79PERCENT R SUB3 PO. OCTYL IODIDE WITH P SUB2 I SUB4 IN THE PRESENCE OF 1-2 MOLES H SUB3 PO SUB4 WAS HEATED GRADUALLY TO 200-100EGREES IN VARIOUS PROPORTIONS AND, AFTER AN ALK. TREATMENT, GAVE UP TO 40PERCENT R SUB3 PO, UP TO 18PERCENT R SUB2 PO SUB2 H AND 34PERCENT RPO SUB3 H SUB2, THE ACIDS BEING ISOLATED IN THE FORM OF CHLORIDES.

UNCLASSIFIED

3/3 012 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0123765

ABSTRACT/EXTRACT--IT WAS SUGGESTED THAT IN THIS REACTION P SUB2 I SUB4 AND H SUB3 PO SUB4 FORM A REACTIVE INTERMEDIATE WITH HO OR OTHER REACTIVE GROUPS WHICH CANNOT BE REPLACED BY R; THIS APPEARS TO BE UNSTABLE AND ABLE TO REACT INSTANTLY WITH RI OR WITH ITSELF, AS IT COULD NOT BE ISOLATED. REACTION OF 2:2:2:2:1 MIXT. OF RI, RED P, I SUB2 AND H SUB3 PO SUB4 GAVE THE FOLLOWING YIELDS: PR (33 HR) 52.7PERCENT R SUB3 PO AND 28.5PERCENT R SUB2 PO SUB2 H; BU (12 HR) 41.4PERCENT R SUB3 PO, AND 52PERCENT R SUB2 PO SUB2 H; C SUB5 H SUB11 (4 HR) 42.2PERCENT R SUB3 PO AND 48.6PERCENT RPO SUB3 H SUB2; ISO-C SUB5 H SUB11 (9 HR) 32.2PERCENT R SUB3 PO AND 57PERCENT RPO SUB3 H SUB2; CYCLO-C SU86 H SUB11 (2 HR) 11PERCENT R SUB3 PO, 40PERCENT R SUB2 PO SUB2 H AND 32.6PERCENT RPO SUB3 H SUB2; AND PHCH SUB2 CH SUB2 (11 HR) 52PERCENT R SUB3 PO, AND 34.8 PERCENT R SUB2 PO SUB2 H. FACILITY: INST. ORG. KHIM., KIEV, USSR.

UNCLASSIFIED

USSR

UDC 547.241

FESHCHENKO, N. G., IRODIONOVA, L. F., KOROL', O. I., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Alkylation of Phosphorus Diiodide and Red Phosphorus"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 773-776

Abstract: Lower alcohols (n-propyl, n-butyl, n-amyl and isoamyl) react with red phosphorus and iodine in a ratio of 1 : 1.2 : 3 at high temperatures (without pressure) much more rapidly than do the corresponding alkyl iodides with phosphorus diiodide or phosphorus and iodine. The reaction results in the formation (following decomposition of the reaction mixture with a solution of sodium hydroxide) of trialkylphosphine oxides and phosphinic or phosphonic acids. A study of the alkylation of phosphorus diiodide or a mixture of red phosphorus and iodine with alkyl iodides in the presence of phosphoric acid showed that the formation of acid products is due to the presence of the phosphoric acid, which not only changes the direction of the reaction, but also helps to speed it up.

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USSR

UDC 546.183 : 547.2 2

FESHCHENKO, N. G., PISAREV, V. T., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Reaction of Phosphorous Acid With Iodine and Alcohols. II."

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 770-773

Abstract: Secondary alcohols and glycols (except ethylene glycol) react with phosphorus and iodine or with phosphorous acid and iodine to give iodides with high yields. The reaction between tertiary alcohols and iodine takes two directions, viz. splitting off of water and formation of an unsaturated compound and formation of alkyl iodide. In the interaction of tertiary alcohols with red phosphorus and iodine dehydration of alcohols is almost completely suppressed by adding crystalline iodine to the alcohol-phosphorus mixture, with tertiary alkyl iodides being obtained in high yields.

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UDC 621.77

SINTERING OF A HEAT-RESISTANT NICKEL-BASE ALLOY

[Article by [illegible], V.P. Kalinin, and T.L. Feshchenko, Department of Rare and [illegible] Metals and Powder Metallurgy, [illegible] Institute of Steel and Alloys; Ordzhonikidze; Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, Russian, No 3, 1971, submitted 2 July 1970, pp 106-109]

Heat-resistant nickel-, iron- and cobalt-base alloys are often used in cast and deformed states. In work /1/ the possibility of producing a heat-resistant nickel-base alloy by means of sintering blanks pressed from powders is reported. The problems of charge preparation and pressing and sintering modes were examined by us in work /2/.

The course of the sintering process is determined to a significant degree by the nature of the corresponding phase diagrams. In the process of sintering complex systems the formation of alloys is accomplished by diffusion and therefore the rate and completeness of the process of heterodiffusion has much significance /3/. The kinetics of sintered body compaction and change of its physicochemical properties depend on the degree of occurrence of this process. To the factors, influencing increase of rate of heterodiffusion, belong granularity of the initial powders, uniformity of component distribution, increase of sintering temperature, removal of adsorbed gases and oxide films and increase in the denisty during pressing. Sintering of complex compositions can be done in both the solid phase and with formation of the liquid phase.

The charge for preparation of the alloy had the following composition (%): 47 Ni, 20 Co, 7.75 Cr, 15 Ni_3Al, 3.75 Cr_3C_2, 5 Mo and 1.5 Ti. Proceeding from the fact that chromium carbide and nickel are added to the charge composition, one can surmise that sintering will proceed with the formation of a liquid phase since it is known /4/ that during sintering of the

USSR UDC 620.179.14

FESHCHENKO, Yu. B., Scientific Research Institute of Ferrous Metallurgy

"Prospects for the Magnetographic Defectoscopy of Rolled Metal"

Sverdlovsk, Defektoskopiya, No 2, 1971, pp 5-13

Abstract: Characteristics of the magnetographic control method of articles of ferromagnetic materials are investigated. Principal control methods are analyzed, including control by means of a magnetic imprint and controls with recording defects on a sliding carrier during magnetizing the article in an applied d-c or a-c magnetic field. Ways for improving the technique of magnetographic defectoscopy are indicated. The prospects of applying magnetographic defectoscopy methods for control of large-scale rolled metal and other products with complex geometry large metal masses, and poor surface condition are discussed. Further development of magnetographic control methods depends mainly on the perfecting of magnetic carriers and the developing of means for reducing the effect of external magnetic fields. Five figures, 15 bibliographic references.

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AA0044810

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

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243843 LENGTH AND SPEED OF MOVING ARTICLE are measured by using a device comprising a magnetic registering block with a registering head land generator 2 of sinusoid current, registers of a fixed frequency, a reproduction block with two reproduction magnetic heads 3 and two boosters 4 of the reproduction signal, signal analysing block incorporating a sensitive to phase cascade 5 and computing system 6. The function of the system is to measure the phases of the computing cibrations, calculating the length of the registered signal and defining speed and length of the moving ferromagnetic article. The stabilising rollers 7 limit the knocking of the article in the control region. 7.1.67 as 1127191/25-8.YU.B.FESHCHENKO et al.FERROUS METALLURGY INST. (1.10.69.) Bul 17/14.5.69. Class 42b. Int.Cl.G 01 b.

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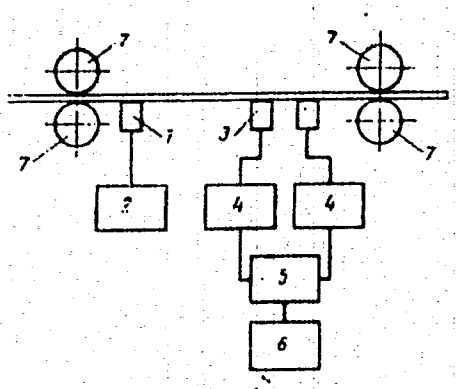

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USSR UDC 669.71.48

FESHCHENKO, Z. I., SKOBEYEV, I. K., SERGEYEVA, V. N.

"Physical-Chemical Characteristics of Samples of Red Sludge"

Obogashch. i metallurgii polezn. iskopayemykh -- V sb. (Beneficiation and Metallurgy of Minerals -- collection of works), Irkutsk, 1970, pp 77-81 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G195)

Translation: The chemical, crystal-optical, thermal, thermogravimetric, and x-ray analyses of sludges obtained when processing bauxites from the Turgayskoye deposit (S1) and the Severoural'skoye deposit (S2) were performed. The chemical composition (content in percentage of dried samples at 110°) of S1 and S2 was as follows: Na_2O 9.45 and 3.57, Al_2O_3 20.74 and 14.00, Fe_2O_3 31.14 and 41.50, SiO_2 17.64 and 9.07, CaO 1.68 and 13, TiO_2 4.84 and 3.76, loss on calcination 9.67 and 8.94, H_2O 2.21 and 0.64. The basic component of S1 is the alkaline hydroalumosilicate of the cyolite type corresponding with respect to its composition to the mineral chabazite (Ca, Na) $(AlSi_2O_6)\cdot 6H_2O$. Other components containing Al_2O_3 in S1 are caolinite, galluazite, feldspar and mica; some of the ferrous minerals; limonite, hematite, goethite and

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FESHCHENKO, Z. I., et al., Obogashch. i metallurgii polezn. iskopayemykh -- V sb., Irkutsk, 1970, pp 77-81

hydrogoethite. The admixtures were the following: quartz, feldspar, calcite, magnetite, martite, anatase, rutile, apatite, and pyroxene. Incompletely leached hydrargillite, diaspore and bemite and caolinite in S2 are of interest for sintering. The ferrous fraction contains hematite, hydrohematite, and hydrogoethite. The admixtures are as follows: calcite, quartz, galluazite, opal, anatase, zircon, tourmaline, and amphibole. Alkaline hydroalumosilicates were not detected. There is 1 table and a 7-entry bibliography.

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UDC 669.71.053.4.094

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FESHCHENKO, Z. I., SKOBEYEV, I. K., KUZ'MINA, G. V.

"Study of the Mechanism of Interaction of Alkali with Bauxite Charge Components"

Obogashch. i metallurgiya polezn. iskopayemykh -- V sb. (Beneficiation and Metallurgy of Minerals -- collection of works), Irkutsk, 1970, pp 75-76 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G145)

Translation: The mechanism of interaction of NaOH and the effect of Fe_2O_3 on extraction of Na_2O and Al_2O_3 during leaching of slurry charge cake are studied. The highest extraction of Na_2O was obtained from the charge cakes in which 75% of the Fe_2O_3 content in the slurry is bound in the sodium ferrite. The extraction of Al_2O_3 is constant for all charges. The cause of low extraction of Na_2O from cakes of certain slurry charges is the formation of compounds of the type of $mNa_2O \cdot pCaO \cdot nSiO_2$ from which Na_2O is not extracted in aqueous solution during leaching of the cakes. On treating red slurry with water with lime (in the ratio of $CaO : Na_2O = 3$), at a

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FESHCHENKO, Z. I., et al., Obogashch. i metallurgiya polezn. iskopayemykh, Irkutsk, 1970, pp 75-76

leaching temperature of 96-98°, with a L : S ratio of 5 : 1 for 8 hours, the degree of regeneration of the Na_2O was 94-95%. The leaching of the Al_2O_3 was 34-35%.

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