L 13063-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ASD(f)-2/AFMDC/ASD(m)-3 MJW/
JD/MLK

ACCESSION NR: AT4046843 S/0000/64/000/000/0204/0208

AUTHOR: Pridantsev, M. V.; Belikova, E. I.; Nazarov, Ye. G.

TITLE: Phase transformations in the KhN35VTYu (EI-787) alloy B

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 204-208

TOPIC TAGS: alloy phase transformation, stainless steel, nickel chromium steel, iron alloy, heat resistant steel, steel aging / alloy EI-787, KhN35VTYu steel

ABSTRACT: The heat resistant alloy EI-787, having an Fe-Ni-Cr base, is strengthened during aging (650-830C) by formation of an intermetallic γ' phase of the type $Ni_3(Ti, Al)$. Metallographic analysis shows that in the stressed EI-787 alloy, the needlelike γ'' phase appears after 15-20 hours at 950C, 75 hours at 900C, 750 hours at 850C and 6000 hours at 800C. The activation energy of the $\gamma' \rightarrow \gamma''$ phase transformation is 104-106 kcal./mole. Chemical analysis of anode coatings shows that as the aging temperature increases, the iron content in the γ' phase rises, especially at 830-900C. The results of X-ray analysis coincide with those of chemical analysis of the γ'' phase. This phase contains: 67% Ni, 20% Ti, 9.5% Fe, 2.5% Cr, 1.1% Al and 0.16% W. Increasing the aging temperature leads to separation

Card 1/2

L 13063-65

ACCESSION NR: AT4046843

0

of larger particles of the γ' phase and then to the appearance of particles of the new γ'' phase. In alloys on a Ni base (EI-437B, EI-445), the appearance of a needlelike η phase with a hexagonal lattice (Ni_3Ti) causes lowering of the plasticity and impact toughness, since the new phase has a lattice differing from that of the solid solution. The tabulated results of tests on alloy EI-787 show that the appearance of the needlelike phase in the coarse grain structure does not lower the plasticity and impact toughness, since the crystal lattice is unchanged. The stress-rupture strength is about 33% lower at 750C, but the time to failure at 750C and 30 kg/mm^2 is 84-369 hours, while the yield point drops slightly. The authors conclude that transformation of the metastable γ' phase into a stable phase in the EI-787 alloy depends on the temperature and duration of heating. Both gamma phases have a similar crystal lattice. The γ'' phase has a needle-laminated structure and contains an increased quantity of iron (about 9%); its chemical composition does not depend on the temperature of formation and duration of heating. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 16Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 007 OTHER: 000

Card 2/2

L 41267-66 EWT(d)/EWT(m)/T/EWP(t)/ETI/EWP(1) IJP(c) JD

ACC NR: AT6026554 (N) SOURCE CODE: UR/2776/66/000/046/0105/0113

AUTHOR: Belikova, E. I.

57
55
8+1

ORG: none

TITLE: Comparative study of EI-437B alloy melted in open-atmosphere or vacuum furnaces 16

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 46, 1966. Spetsial'nyye stali i splavy (Special steels and alloys), 105-113

TOPIC TAGS: ~~nickel alloy~~ alloy, chromium containing alloy, titanium containing alloy, aluminum containing alloy, boron containing alloy, heat resistant alloy, alloy melting, vacuum melting, nickel alloy ~~property~~/EI-437B alloy, EI-437BU 16

ABSTRACT: The structure and properties of heat-resistant EI-437B and EI-437BU alloys melted in open-atmosphere, vacuum-arc, or induction furnaces have been studied at TsNIIChM in cooperation with the Chelyabinsk, Zlatov, and Elektrostal' metallurgical plants. The purpose of this study was to determine why vacuum-melted alloy has lower heat resistance than alloys melted in open-atmosphere furnaces and to find ways to improve its heat resistance. Specimens were annealed at 1050—1170C for 8 hr, air cooled, and aged at 550—900C for 16—100 hr. The experiments showed that the low heat resistance of vacuum-melted alloys is a result of a low content of the strength-

Card 1/2

L 41267-66

ACC NR: AT6026554

ening γ' phase which forms during aging and does not exceed 7.56% in vacuum-melted alloy as compared to 11.51% in alloy melted in open atmosphere. The rupture life of open-atmosphere melted alloy, aged at 700 or 750C and tested at 750C under a stress of 35 kg/mm^2, was 154 or 157 hr, at a total elongation of 5.8 or 5.6% and a reduction of area of 8.4 or 7.2%. Corresponding figures for vacuum-melted alloy were 61 or 51 hr, 6.4 or 9.8%, and 9.6 or 11.4%. Aging at higher temperatures lowered the values of rupture life for both types of alloy, especially of open-atmosphere melted alloy, whose rupture life after aging at 800C dropped to 81 hr compared to 54 hr for vacuum-arc melted alloy. The causes of the reduction in the properties of vacuum-melted heat-resistant alloy are being investigated. Orig. art. has: 6 figures and 4 tables. [AZ]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 005/ ATD PRESS: 5159

Card 2/2 ZC

L 09952-67 EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/JH

ACC NR: AT6026553 SOURCE CODE: UR/2776/66/000/046/0099/0104

AUTHORS: Bolikova, E. I.; Boyarshinov, V. A.; Antipov, V. M.; Pirogova, Z. N.; Okorokov, G. N.; Guloy, G. G. 41

ORG: none

TITLE: Structure and properties of alloy EI437B smelted in a vacuum induction furnace

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 46, 1966. Spetsial'nyye stali i splavy (Special steels and alloys), 99-104

TOPIC TAGS: alloy, vacuum arc furnace, vacuum melting / EI437B alloy

ABSTRACT: The effect of aluminum and titanium additions on the properties of the heat-resistant alloy EI437B, smelted in a vacuum induction furnace, was investigated. The study was prompted by the fact that the alloy smelted by the Chelyabinsk and Zlatoust Metallurgical Plants using vacuum induction furnaces was inferior to the alloy smelted in open arc furnaces. The experimental results are presented in graphs and tables (see Fig. 1). It was found that to insure high mechanical qualities of the alloys smelted in vacuum induction furnaces, the aluminum content should be

Card 1/2

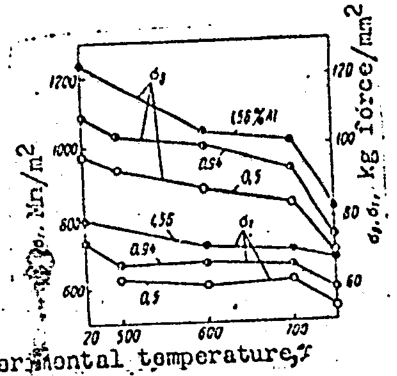

Fig. 1. Mechanical properties of alloy EI437B as a function of the testing temperature. Quenching from 1080C, annealed for 16 hrs, cooled in air, and aged for 16 hrs at 700C, cooled in air.

0.8--1.0% and the titanium content 2.7--3.0% respectively. Orig. art. has: 3 tables and 4 graphs.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 008

L 31276-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP5025124 SOURCE CODE: UR/0079/65/035/010/1746/1752

AUTHOR: Belikova, N. A.; Lebedeva, K. V.; Mel'nikov, N. N.; Plate, A. F.

51
B

ORG: All-Union Scientific Research Institute of Chemical Means for Plant Protection (Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskiky sredstv zashchity rasteniy)

TITLE: From the field of organic insecticides-fungicides. LXXXIII. Oxidation of some cyclic compounds with hydrogen peroxide

27 27

SOURCE: Zhurnal obshchey khimii, v. 35, no. 10, 1965, 1746-1752

TOPIC TAGS: cyclic compound, hydrogen peroxide, oxidation, chemical synthesis, insecticide, fungicide

ABSTRACT: Unsaturated cyclic compounds, including bridged and fused hydrocarbons, chlorohydrocarbons, aldehydes, esters, alcohols and nitriles with unsaturation in ring or side chains were oxidized with hydrogen peroxide to study possibly convenient routes for synthesis of α-hydroxy compounds and particularly of such compounds with potential insecticide-activity, replacing methods which apply unstable and explosive peroxy-acids. The compounds were treated at 40—100C 2—6 hr with 2—3 or 1—2 mole H_2O_2/mole starting compound in glacial acetic acid or tert.-butyl alcohol, respectively. In glacial acetic acid,

Card 1/2 UDC: 542.955.2:547.5

L 41276-66
ACC NR: AP5025124

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α -hydroxy substitution was produced if such compounds had sufficient stability under reaction conditions, glycols or monoacetates of the latter being otherwise obtained. Unsaturation in side chains gave mainly glycols or acetates, and oxidation in tert.-butyl alcohol gave α -hydroxy compounds or glycols. Orig. art. has: 2 tables.

SUB CODE: 06/ 07/ SUBM DATE: 08Jun64/—Oct65/ ORIG REF: 018/ OTH REF: 016

Card 2/2 LC

J-5

USSR/Soil Science - Cultivation, Melioration, Erosion.

Abs Jour : Ref Zhur - Biol., No 9, 1958, 39042

Author : Belikova, E.M.

Inst : Leningrad Agricultural Institute.

Title : The Experiment of Deepening the Arable Layer on Humus-Carbonate Soils in Industrial Conditions.

Orig Pub : Zap. Leningr. s.-kh. in-ta, 1956, vyp. II, 323-324.

Abstract : A potato crop produced by deepening the arable layer up to 26-28 cm was 27.6% greater than when the soil was only plowed to 18-20 cm. The experiment was conducted on humus-carbonate soils in the Leningrad district. The yield of barley, when plowed up to the depth of 25-26 cm, was increased by 19.3%; and the yield of winter wheat was increased by 16.6% in comparison with the yield of fields plowed only to a depth of 18-20 cm.

Card 1/1

ABDULLIN, R.; BELIKOVA, G.

"Mechanization of tank cleaning" by E.L.Rzhavskii. Reviewed by R.Abdullin, G.Belikova. Neftianik 6 no.8:33 Ag '61. (MIRA 14:10)

1. Sotrudniki Tatarskogo nauchno-issledovatel'skogo neftyanogo instituta. (Tanks—Cleaning)

CZECH

Catalytic decomposition of furfural azine. N. I. Shuikin, M. V. Yushkevich, and G. S. Belikova (Moscow State Univ.). *Sbornik Statei Obshchei Khim.* 2, 1112-14(1953).— To 34.2 g. $N_2H_4.HCl$ in 150 ml. H_2O was added 96 g. furfural and after 1 hr. stirring, the ppt. of HCl salt of the product was sepd. and treated with NaOH, yielding furfural azine, m. 110.5° (from EtOH). This (20 g.) in 75 ml. pyridine was passed through a tube with broken glass in N at 360-70°, yielding 33.8% *furfurastilbene*, (α-C_4H_3OCH:)$_2$ (I), m. 97.6°. A similar reaction with C_6H_6 instead of pyridine gave 41.2% yield; the remainder was unchanged starting material. The reaction at 425° (in C_6H_6) gave 55.8% I (some expts. gave up to 60%). With activated C filler the yield dropped to 24.1%; in an empty tube the yield was 12.3%.

G. M. Kosolapoff

BELIKOVA, G.S.; VARFOLOMEYEVA V.N.; ZHEVANDROV, N.D.

Use of diagrams of luminescence polarization in determining the orientation of impurity molecules in crystals. Izv. AN SSSR. Ser. fiz. 29 no.8:1326-1330 '65. (MIRA 18:8)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR i Institut kristallografii AN SSSR.

SOV/70-3-6-23/25

AUTHORS: Belyayev, L.M., Belikova, G.S., Fridkin, V.M. and Zheludev, I.S.

TITLE: On the Question of the Electret State in Naphthalene (K voprosu ob elektretnom sostoyanii v naftaline)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 6, pp 762-763 (USSR)

ABSTRACT: Baldus (Z. Angew.Phys., 1954, Vol 6, p 481) reported observing the transformation of hetero-charging in a naphthalene electret into homo-charging. This result contradicts other work and experiments were carried out to clarify the situation. Liquid naphthalene was allowed to set in an electric field between two Al plates 5 mm apart. The field of 4kV/cm was applied for 90 minutes. The naphthalene plate was removed from the condenser and tested with a dynamic electrometer. Heterocharging was found. Discharging by illumination was then tried. Integration of the discharge current gave an initial charge of 10^{-8} coulomb/cm^2. Repeated illumination gave no further discharge current. Hence the heterocharging is conditioned by localised electrons. Plates cut from single crystals of naphthalene were then tried. They were subjected to a field of 3 kV/cm for 10 min with U/V

Card1/2

SOV/70-3-6-23/25

On the Question of the Electret State in Naphthalene

illumination. The charge density produced was about 10^{-10} coulomb/cm^2. A similar charge density could be produced by polarising in the dark. This shows that a sharp distinction cannot be drawn between the photoelectret and thermoelectret states in naphthalene and that both these phenomena are controlled by the same mechanism.
There are 5 references, 2 of which are Soviet, 2 English and 1 German.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography of the Ac.Sc.USSR)

SUBMITTED: June 28, 1958

Card 2/2

18,9500

S/058/62/000/009/021/069
A006/A101

AUTHORS: Belyayev, L. M., Belikova, G. S., Dobrzhanskiy, G. F.

TITLE: A crystallizer for the growing of organic crystals from a melt

PERIODICAL: Referativnyy zhurnal, Fizika, no. 9, 1962, 10, abstract 9E68 (In collection: "Rost kristallov. T. 3", Moscow, AN SSSR, 1959, 102 - 104)

TEXT: A description is given of a crystallizer for growing single crystals of low-melting organic substances (for instance, naphthalene and tolane) from melts by the modified Stöber method (F. Stöber, "Z. Kristallogr.", 1924, v. 61, 299). Glass crystallizer and thermostat are used. The crystal grows out of an oriented seed, covering the plane crystallizer bottom which contacts the refrigerator. The advantage of the described unit is the possibility of observing the crystal growth process.

[Abstracter's note: Complete translation]

Card 1/1

BELIKOVA, G.S.; BELYAYEV, L.M.

Mixed organic crystals for scintillation counters. Kristallografiia 4 no.6:929-930 N-D '59. (MIRA 14:5)

1. Institut kristallografii AN SSSR.
(Scintillation counters)

1

30537

S/564/61/003/000/008/029
D258/D304

5.4500 2209

AUTHOR: Belikova, G. S., and Belyayev, L. M.

TITLE: Mixed organic crystals for scintillation counters

SOURCE: Akademiya nauk SSSR. Institut kristallografii. Rost kristallov, v. 3, 1961, 316-321

TEXT: The authors studied the mechanism by which mixed organic crystals of improved luminescence are formed. Mixtures of naphthalene with up to 1% b.w. of a luminescent compound were used. The latter compounds could be divided into the following groups: (1) anthracene-phenantrene-chrysene; (2a) diphenyl-p-terphenyl-quaterphenyl; (2b) dibenzyl-stilbene-tolane; (2c) 1,4-diphenylbuta-1,3-diene (DPB)-1,6-diphenylhexa-1,3,5-triene (DPH)-1,1,4,4-tetraphenylbuta-1,3-diene (TPB); (3) anthranilic acid, methyl anthranilate-N-methyl anthranilic acid-N-phenyl anthranilic acid. The mixed crystals were grown from a melt of the purified components, using two methods, namely, that of L. M. Belyayev, G. S. Belikova, and G. F. Dobrzhanskiy (Ref. 3: Akad. nauk SSSR. Rost kristallov,

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Card 1/3

30537

Mixed organic crystals... S/564/61/003/000/008/029
D258/D304

thalene) vanishes. These results are interpreted by the authors in terms of interaction between the two molecules in the crystals. Such interaction is a function of the similarity in structure and depends on the formation of solid solutions. It was shown by A. I. Kitaygorodskiy (Ref. 6: Kristallografiya, 2, no. 4, 456, 1957) that such a formation is conditioned by the similarity of both shape and size of the components. Accordingly, the projection of naphthalene was compared with that of the added compounds. The conclusions drawn from these comparisons are in agreement with the experimental results. Finally, luminescence is shown to be used as a method of estimating the quantity of the luminescent compound having entered the composition of the crystal. The use of luminescence in analysis has been proposed by F. D. Klement (Ref. 8: Trudy Inst. fiziki i astronomii Akad. nauk Estonskoy SSR, no. 7, 1958). There are 3 figures and 8 references: 5 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: I. B. Birks, Proc. Phys. Soc., A., 63, 9, no. 36, 1044, 1950; E. I. Bowen, Chemical aspects of light, Oxford, 1949.

X

Card 3/3

32048

55310 also 1138

S/051/61/011/005/008/018
E202/E192

AUTHORS: Bonch-Bruyevich, A.M., Kovalev, V.P., Belyayev, L.M., and Belikova, G.S.

TITLE: Study of the kinetics of the sensitised luminescence of certain additives in naphthalene crystals

PERIODICAL: Optika i spektroskopiya, v.11, no.5, 1961, 623-628

TEXT: Studies of photoluminescence of naphthalene crystals were carried out using the following activating additives: anthranilic acid (AK); 1.4-diphenylbutadiene-1.3 (DPB); 1.6-diphenylhexatraene-1.3,5 (DPH). The time of decay of the activating additive was measured by means of phase fluorometer. The crystal was excited within the absorption bands of naphthalene skeleton (i.e. $\lambda_B = 313$ mμ), and the activator at $\lambda_B = 365$ mμ. In the case of AK molecule (which is similar to naphthalene) a simple replacement in the lattice of the latter was thought to be the most likely mechanism. DPB and DPH molecules, although quite different from the naphthalene molecule, were considered to be able to replace in the lattice two molecules of

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Card 1/4

32048

Study of the kinetics of the ... S/051/61/011/005/008/018
E202/E192

naphthalene each. The molecular concentration ratio of AK/NAPH was 0.0002, and DPB/NAPH = DPH/NAPH = 0.0003, so that the X-ray measurements did not disclose any changes in the lattice parameters. However, the changes in the luminescence properties were indicative of a true solid solution. The specific times of light persistence and the times of light persistence for low and high concentrations of activators are given in Table 1. The actual process of the energy migration in a crystal was explained as follows: during the absorption of light in the lattice of a molecular crystal, an exciton is formed which moves within the regular field of the lattice with the characteristics of a diffusion process. The exciton is localised in the excited field near the activator, part of its energy is scattered and finally it is captured by the activator. Hence the total measured time of the persistence of light consists of three stages: 1 - time of exciton diffusion; 2 - time of exciton's life in a localised state; 3 - specific time of light persistence of the activator. Each of these times was evaluated. There are 4 figures, 3 tables and 20 references: 8 Soviet-bloc, 1 translation into Russian from

X

Card 2/4

32048

Study of the kinetics of the ... S/051/61/011/005/008/018
E202/E192

non-Soviet-bloc publication, and 11 non-Soviet. The four most recent English language references read as follows:

Ref.11: I. Birks, Phys.Rev., v.94, 1567, 1954.
Ref.14: S.C. Ganguly, N.K. Choudhury. Rev. Mod. Phys., v.31, 920, 1960.
Ref.15: O. Simpson. Proc.Roy.Soc., A238, 402, 1957.
Ref.19: D.C. Northrop. O. Simpson, Proc.Roy.Soc., A234, 136, 1956.

SUBMITTED: December 9, 1960

X

Card 3/4

32048

Study of the kinetics of the ... S/051/61/011/005/008/018
E202/E192

Table 1

Activator	Spec. time of light persistence of the activator (sec)	Time of persistence with excitation through the lattice (sec)	
		Low concentr. of activator	higher concentr. of activator
AK	6.7×10^{-9}	19×10^{-9}	12.6×10^{-9}
DPB	1.5×10^{-9}	16.2×10^{-9}	13×10^{-9}
DPH	4.6×10^{-9}	19.5×10^{-9}	6.9×10^{-9}

X

Card 4/4

S/181/63/005/001/058/064
B104/B186

AUTHORS: Fridkin, V. M., and Belikova, G. S.

TITLE: Photodepolarization of some crystals of aromatic hydrocarbons

PERIODICAL: Fizika tverdogo tela, v. 5, no. 1, 1963, 356-358

TEXT: The depolarization of a number of charged hydrocarbon crystals (anthracene, phenanthrene, stilbene, tolane, naphthalene) was found to be unipolar on irradiation in the fundamental absorption band. The crystal surfaces were charged by adsorption of positive and negative ions from corona discharges in the air. The photodepolarization curves were determined with a dynamic electrometer and a low-frequency oscillograph. The depolarization of all crystals except that of naphthalene was proved to be unipolar. Phenanthrene, stilbene, and tolane mainly have p-type conductivity, whereas anthracene has both p-type and n-type conductivity. All crystals are photoconductive also outside the fundamental absorption band, but in these regions unipolarity could not be proved. According to H. Kallmann, B. Rosenberg (Phys. Rev., 97, 1596, 1955), W. Moore, and M. Silver (J. Chem. Phys., 33, 1671, 1960), the photoconductivity of

Card 1/2

anthracene is caused by the production of free holes and is extrinsic. The activation energy of the impurity levels was measured to be 1.8 ev. The formation of the photoelectret state is assumed to be due to these levels. The results are not in contrast to the mechanism of photoconductivity according to which free carriers are produced by diffusion of excitons from the volume to the surface. There are 1 figure and 1 table.

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

SUBMITTED: September 21, 1962

L 18575-63 EWP(j)/EPF(c)/EWT(l)/EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3/IJP(C)
Pc-4/Pr-4 JAJ/RM/WW/JD/MAY

ACCESSION NR: AP3001301 S/0181/63/005/006/1735/1737

78
76

AUTHORS: Belikova, G. S.; Kusev, V. G.; Fridkin, V. M.

TITLE: Nonlinear photodepolarization of crystals resulting from a space-charge-limited photocurrent

21 14

SOURCE: Fizika tverdogo tela, v. 5, no. 6, 1963, 1735-1737

TOPIC TAGS: photodepolarization, carrier, space charge, volt-ampere characteristic, photocurrent, drift, mobility, dielectric constant, injection, I, N, anthracene, corona discharge

ABSTRACT: This work is a continuation of earlier work on nonlinear photodepolarization produced by relatively large displacement of carriers. In the present work it is shown that the relative potential, V/V_0, depends on initial potential, V_0, in inverse fashion however, diminishing more rapidly as the value of V_0 rises. To test this conclusion, the authors investigated the photodepolarization of single crystals of anthracene on the surface of which positive ions of nitrogen have been adsorbed from corona discharge in air. The method has the advantage of excluding injection of carriers into the crystal. The technique

Card 1/2

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ACCESSION NR: AP3001301

2

has been described in detail in previous papers (V. M. Fridkin, Yu. N. Barulin, FTT, 4, 2982, 1962; DAN SSSR, 145, 1, 78, 1962). Measurements were made on a plate of anthracene with an area of about 2 cm^2 and a thickness of 0.3 cm, cut parallel to the (001) face. Depolarization of the crystal was effected by illumination in monochromatic light having a wave length of 405 mμ. Results show that V/V_0 declines more rapidly with increase in V_0 and that the relation deviates somewhat from that predicted by the theoretical derivation; i.e., the space-charge-limited photocurrent obeys the square law. The deviation in theoretical and experimental values may be explained by variations in degree of refinement of specimens or by the presence of shielded space charge, the radius of shielding being as great as the thickness of the crystal specimen. Tests made at different intensities of light show agreement with results of other authors. Orig. art. has: 2 figures and 5 formulas.

ASSOCIATION: Institut kristallografii AN SSSR, Moscow (Institute of Crystallography, Academy of Sciences, USSR); Institut fiziki Bolgarskoy Akademii nauk, Sofia (Institute of Physics, Bulgarian Academy of Sciences)

SUBMITTED: 01Feb63 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 006

Card 2/2

S/070/63/008/002/004/017
E021/E120

AUTHORS: Aleksandrov K.S., Belikova G.S., Ryzhenkov A.P., Teslenko V.R., and Kitaygorodskiy A.I.

TITLE: Elastic constants of molecular crystals. Elastic constants of naphthalene

PERIODICAL: Kristallografiya, v.8, no.2, 1963, 221-224

TEXT: A study of the elastic constants is the main method of investigating the laws of interaction of molecules, a knowledge of which is necessary for constructing a theory of the properties of organic crystals. Coarse crystals of naphthalene grown from the melt and annealed for three days were studied. The orientation of the crystals was found by X-ray measurements. Measurements of the rate of propagation of elastic waves in the crystal were carried out using ultrasonic apparatus at frequencies of 1.7 and 5.0 megacycles. The waves were propagated in six different directions:

[001] , [110] , [010] , [101] , [100] and [011].

The rates of propagation in three directions at right angles were measured in each case. From the results the moduli of elasticity

Card 1/2

Elastic constants of molecular ... S/070/63/008/002/004/017
E021/E120

were measured, e.g. the volume compressibility is equal to 20×10^{-6} cm^2/kg. It was shown that the results obtained experimentally agreed with theoretical values calculated by the method of A.I. Kitaygorodskiy (Dokl. AN SSSR, v.137, 1, 1961, 116) and A.I. Kitaygorodskiy and K.V. Mirskaya (Kristallografiya, v.6, 3, 1961, 406).
There is 1 table.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds, AS USSR)

SUBMITTED: August 25, 1962

Card 2/2

ACCESSION NR: AP4043386 S/0181/64/006/008/2526/2528

AUTHORS: Belyayev, L. M.; Belikova, G. S.; Dobrzhanskiy, G. F.; Nemesov, G. B.; Shaldin, Yu. V.

TITLE: Dielectric constant of crystals possessing the electro-optical effect

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2526-2528

TOPIC TAGS: dielectric constant, dielectric loss, electrooptic device, phosphate, optical communication, ir communication

ABSTRACT: The authors measured the dielectric constant ε and the loss angle tangent tanδ in the frequency range from 10^2 to 40 x 10^9 cps of the crystal $NH_4H_2PO_4$ and KH_2PO_4 relative to the corresponding values for air. The dispersion properties of these constants are important because the electro-optical effect in crystals is used for broadband modulation of electromagnetic radiation at optical and infrared wavelengths. The test procedure and the formulas for the

Card 1/4

ACCESSION NR: AP4043386

determination of the quantities of interest are taken from the book by A. R. Hippel (Dielectrics and Waves, N.Y., 1954). The data lead to the conclusion that the bandwidth properties of modulators which use the electro-optical effect in these crystals is limited to the centimeter wavelength band by the increase in thermal effect, which lead to breakdown of the crystals. Similar tests made on cubic crystals ($N_4(CH_2)_6$ and CuCl) show $N_4(CH_2)_6$ to be preferable for these purposes because they have a smaller loss angle in the millimeter band, and because the phase velocity of the light wave is equal to the phase velocity of the microwave. Orig. art. has: 2 tables.

ASSOCIATION: Institut kristalografii AN SSSR, Moscow (Institute of Crystallography, AN SSSR)

SUBMITTED: 24Jan64 ENCL: 02

SUB CODE: OP, SS NR REF SOV: 000 OTHER: 004

Card 2/4

ACCESSION NR: AP4043386

ENCLOSURE: 01

Values of ε and $\tan\delta$ for uniaxial crystals

¹Частота, гц	$NH_4H_2PO_4$			KH_2PO_4		
	$\varepsilon_{\parallel}$	$\varepsilon_{\perp}$	$tg\,\delta_{\parallel}$	$\varepsilon_{\parallel}$	$\varepsilon_{\perp}$	$tg\,\delta_{\parallel}$
	²относительные значения					
10^2	16.0 ± 0.5	55.8 ± 1.5	0.1	21.8 ± 0.5	43.7 ± 1.5	0.06
10^3	15.9 ± 0.5	57.0 ± 1.5	0.065	21.3 ± 0.5	43.3 ± 1.5	0.008
10^4	15.5 ± 0.5	56.0 ± 1.5	0.018	20.8 ± 0.5	43.2 ± 1.5	0.002
10^6	15.3 ± 0.5	55.8 ± 1.5	0.005	20.1 ± 0.5	43.0 ± 1.5	0.0006
$9.8 \cdot 10^8$	15.0 ± 0.5	55.5 ± 1.5	0.005	20.0 ± 0.5	42.5 ± 1.5	0.0005
$9.4 \cdot 10^9$	14.7 ± 0.5	55.3 ± 1.5	0.041	19.7 ± 0.5	42.3 ± 1.5	0.0008
$3.96 \cdot 10^{10}$	14.0 ± 0.5	55.0 ± 1.5	0.08	19.6 ± 0.5	42.0 ± 1.5	0.003

1 - Frequency, cps, 2 - relative values

ACCESSION NR: AP4043386

ENCLOSURE: 02

Values of ε and tan δ for cubic crystals

Частота, гц	$N_4(CH_2)_6{}^1$		$N_4(CH_2)_6{}^1$		CsCl	
	ε	tg δ	ε	tg δ	ε	
	относительные значения					
10^2	2.5 ± 0.2	0.1	2.5 ± 0.2	0.1	10.0 ± 0.5	—
10^3	2.5 ± 0.2	0.065	2.5 ± 0.2	0.04	9.8 ± 0.5	—
10^4	2.5 ± 0.2	0.018	2.5 ± 0.2	0.011	9.2 ± 0.5	—
10^5	2.5 ± 0.2	0.005	2.5 ± 0.2	0.001	8.8 ± 0.5	—
$9.8 \cdot 10^6$	2.6 ± 0.2	0.005	2.6 ± 0.2	0.0008	8.6 ± 0.5	—
$9.4 \cdot 10^9$	2.6 ± 0.2	0.005	2.6 ± 0.2	0.0008	8.4 ± 0.5	—
$3.96 \cdot 10^{10}$	2.6 ± 0.2	0.005	2.6 ± 0.2	0.0008	8.3 ± 0.5	—

Card 4/4

BELIKOVA, G.S.; BELYAYEV, L.M.; TIKHOMIROVA, N.N.

Growing trioxane crystals. Kristallografiia 10 no.3:444 My-Je '65.
(MIRA 18:7)

1. Institut kristallografii AN SSSR.

L 62701-65 EEC(b)-2/EWT(1)/T Pi-4 IJP(c) GG
ACCESSION NR: AP5019569 UR/0191/65/000/008/0041/0043
678.644.141:542.65

AUTHOR: Belikova, G. S.; 44,55 Tikhomirova, N. S.; 44,55 Serenkov, V. I.; 44,55 Akutin, M. S. 44,55 31 B

TITLE: Growing trioxane monocrystals 21

SOURCE: Plasticheskiye massy, no. 8, 1965, 41-43

TOPIC TAGS: monocrystal, trioxane, formaldehyde trimer, trioxane polymer, zone melting

ABSTRACT: Large trioxane monocrystals are required for the study of radiation-induced solid-phase polymerization 7,44,55 of crystalline trioxane 7 of high purity. In previous experiments, results could not be adequately reproduced because of the presence of impurities and nonuniformity in crystal size. In this work monocrystals were made by passing sealed ampuls with trioxane through specially designed ovens with a given temperature gradient at a predetermined rate. The trioxane monocrystals obtained had random orientation; they were up to 70 mm high, 35 mm in diameter, colorless, transparent and optically sufficiently uniform. The use of large trioxane monocrystals made it possible to confirm some aspects of solid-phase radiation-induced polymerization with a high degree of reproducibility. Orig. art. has: 3 figures. [VS]

Card 1/2

L 62701-65

ACCESSION NR: AP5019569

0

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: SS, GC

NO REF SOV: 006

OTHER: 003

ATD PRESS: 4064

Card 2/2

L 65237-65 EPF(c)/EWT(l)/EWT(m)/EWP(j)/EWA(c) IJP(c) GG/RM

ACCESSION NR: AP5020793 UR/0048/65/029/008/1326/1330 52 50 B

44,55 44,55 44,55

AUTHOR: Belikova, G. S.; Varfolomeyeva, V. N.; Zhevandrov, N.D.

21,44,55

TITLE: Determination of the orientation of impurity molecules in crystals by means of luminescence polarization diagrams /Report, 13th Conference on Luminexcence held in Khar'kov 25 June to 1 July 1964/

44,55

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 8, 1965, 1326-1330

TOPIC TAGS: polarized luminescence, luminescent crystal, organic crystal, crystal impurity

1

ABSTRACT: The orientation of anthracene molecules in stilbene and diphenylacetylene crystals and that of 1,6-diphenylhexatriene-1,3,5 molecules in diphenylacetylene crystals were determined by the luminescence polarization diagram method that has been described elsewhere (N.D.Zhevandrov, Izv. AN SSSR. Ser. fiz., 20, 553, 1956; Tr. Fiz. in-ta AN SSSR, 25, 3, 1964. V.N.Varfolomeyeva and N.D.Zhevandrov, Optika i spektroskopiya, 5, 572, 1958). The crystals were grown by the Bridgman and Obreimov-Shubnikov method from melts containing from 0.1 to 0.01% of the additive; the crystals contained less dopant than the melts. The luminescence polarization diagrams were obtained with oriented hemispherical single crystals

Card 1/3

L 65237-65

ACCESSION NR: AP5020793

by methods described in the references cited above. The data were interpreted by making plausible assumptions concerning the orientation of the luminescence oscillator in the impurity molecule and of the impurity molecule in the host lattice, calculating theoretical luminescence polarization diagrams, and comparing the calculated diagrams with the experimental data. Agreement was obtained by assuming that the impurity molecules are oriented in the host lattice with their planes parallel to the planes of the host molecules and that the luminescence oscillator is oriented perpendicular to the molecular axis in anthracene and parallel to the molecular axis in diphenylhexatriene. Better agreement was found for anthracene than for diphenylhexatriene. This is ascribed to a local deformation of the lattice by the diphenylhexatriene molecules. A minimum on one of the experimental diagrams for anthracene which did not occur in the theoretical diagram is ascribed to internal conical refraction. It is pointed out that, when it is applicable at all, the luminescence polarization method for determining impurity orientation in crystals is very much more sensitive than the x-ray diffraction method. Orig. art. has: 6 figures.

Card 2/3

L 65237-65

ACCESSION NR: AP5020793

6

44,55

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva Akademii nauk SSSR. (Physics Institute, Academy of Sciences, SSSR); Institut kristallografii Akademii nauk SSSR (Institute of Crystallography, Academy of Sciences, SSSR) 44,55

SUBMITTED: 00 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 005 OTHER: 000

Card 3/3

BELIKOVA, G.S.; TIKHOMIROVA, N.S.; SERENKOV, V.I.; AKUTIN, M.S.

Growing of trioxane single crystals. Plast. massy no.8:41-43 '65.
(MIRA 18:9)

L 36404-66 EWT(m)/EWP(j) RM

ACC NR: AP6018774 SOURCE CODE: UR/0070/66/011/003/0439/0442

AUTHOR: Belikova, G. S.; Belyayev, L. M.; Benetskiy, B. A.

ORG: Institute of Crystallography im. P. N. Lebedev, AN SSSR (Institut kirstallografii AN SSSR); Physics Institute (Fizicheskiy institut)

TITLE: Deuteration of organic crystals for scintillation spectrometry by fast neutrons 19

SOURCE: Kristallografiya, v. 11, no. 3, 1966, 439-442

TOPIC TAGS: ~~deuterated compound, octadeuteronaphtalene,~~ anthranilic acid, single crystal, scintillation, luminescence spectrum, fast neutron, ~~dose~~ organic crystal

ABSTRACT: The characteristics of mixed single crystals of octadeuteronaphtalene containing 81.7 and 94.3 at % deuterium, were studied. Mixtures were made by melting the single crystals with 0.7 wt % anthranilic acid--the optimum content for naphtalene scintillation. The isotope interchange between the molecules of anthranilic acid and octadeuteronaphtalene was indicated by luminescence spectra and scintillation spectrometry. Luminescence spectra of pure and mixed crystals were obtained using a mercury lamp with a filter (λ=313 mμ). The spectra were different from naphtalene due to an isotopic increase in levels resulting from the substitution of hydrogen by deuterium. The scintillating properties were measured by the secondary frequency spectra of γ-

UDC: 548.5 : 539.107.43

Card 1/2

L 36404-66

ACC NR: AP6018774

-quanta after bombardment by 14 Mev neutrons. Mixed naphtalene was compared with mixed octaneuteronaphtalene by this method. Maxima were observed in the spectra of octaneuteronaphtalene crystals at a channel number of 25, as a result of the neutron energy. These crystals could serve as a new class of organic scintillators for neutron spectrometers in the megavolt region. Such crystals could be produced industrially in diameters of 200 mm from which various scintillator shapes can be fashioned. Other favorable aspects of these crystals such as light yield and inelastic dispersion by fast neutrons were discussed. The authors thanked I. M. Frank for participation in useful discussions and A. A. Samakhov for providing samples of the various materials. Orig. art. has: 2 figures.

SUB CODE: 18, 20 SUBM DATE: 21Jun65/ ORIG REF: 006/ OTH REF: 003

Card 2/2 mLP

KOTLYAR, A.M., nauchnyy sotrudnik; ODINTSOVA, A.P.; BELIKOVA, K.P.

Follow-up of published articles. Tekst.prom.22 no.3:94-96 Mr '62.
(MIRA 15:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut sherstyanoy promyshlennosti (for Kotlyar). 2. Glavnyy inzh. fabriki "Krasnaya krutil'shchitsa" (for Odintsova). 3. Nachal'nik planovogo otdela
(Textile industry)

SHVAREV, V.A., kand.istorich.nauk, otv.red.; BELYAYEV, A.A., red. (g.Vladivostok); BELIKOVA, L.I., kand.istoricheskikh nauk, red.; VISHNEVSKIY, V.M., kand.istoricheskikh nauk, red.; KRUSHANOV, A.I., kand.istoricheskikh nauk, red. (g.Vladivostok); LESHKEVICH, V.V., kand.istoricheskikh nauk, red. (g.Vladivostok); MULENKOV, A.G., kand.istoricheskikh nauk, red.; SHADRIN, K.M., tekn.red.

[The Far East during forty years of Soviet government] Dal'nii Vostok za 40 let Sovetskoi vlasti. Komsomol'sk-na-Amure, 1958. 552 p. (MIRA 12:12)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Dal'nevostochnyy filial, Vladivostok.
(Soviet Far East)

BELIKOVA, L. S.

VARLAMOV, Vasiliy Savel'yevich; BELIKOVA, L.S., redaktor; CHERYSHEVA, Ye.A., tekhnicheskiy redaktor

[Manufacture of drying oils and dessicants] Proizvodstvo olif i sikkativov. Moskva, Pishchepromizdat, 1957. 99 p. (MLPA 10:10)
(Drying oils)

BELIKOVA, L.S.

NEVOLIN, Fedor Vasil'yevich; BELIKOVA, L.S., red.; CHEBYSHEVA, Ye.A., tekhn.red.

[Synthetic cleaning agents] Sinteticheskie moiushchie sredstva. Moskva, Pishchepromizdat, 1957. 143 p. (MIRA 10:12)
(Cleaning compounds)

BELIKOVA, L.S.

KUL'MAN, Avgust Gustavovich; REBINDER, P.A., akademik, red.; BELIKOVA, L.S., red.; CHEBYSHEVA, Ye.A., tekhn.red.

[Physical and colloid chemistry] Fizicheskaia i kolloidnaia khimiia. Izd. 2-e, perer. i dop. Pod red. P.A.Rebindera. Moskva, Pishchepromizdat, 1957. 412 p. (MIRA 11:4)
(Chemistry, Physical and theoretical)
(Colloids)

SHNAYDMAN, Lev Osipovich; SAVINOV, B.G., doktor tekhn.nauk, retsenzent;
LEBEDEV, A.D., inzh., retsenzent; BELIKOVA, L.S., red.; SOKOLOVA,
L.A., tekhn.red. [redacted]

[Production of vitamins] Proizvodstvo vitaminov. Moskva,
Pishchepromizdat, 1958. 413 p. (MIRA 12:2)
(Vitamins)

ZHVIRBLYANSKAYA, Adel'geyda Yul'yevna; ZUBENKO, A.P., inzh., spetsred.;
BELIKOVA, L.S., red.; TARASOVA, N.M., tekhn.red.

[Microbiological control in brewing] Mikrobiologicheskii kontrol' pivovarennogo proizvodstva. Moskva, Pishchepromizdat, 1959.
55 p. (MIRA 12:12)
(BREWING) (MICROBIOLOGY)

TOVBIN, Isaak Moyseyevich, inzh.; BELIKOVA, L.S., red.; GOTLIB, E.M.,
tekhn.red.

[Ways and prospects for the development of synthetic fat substitutes and cleaning compounds; brief technical and economic survey] Puti razvitiia proizvodstva sinteticheskikh zhirozamenitelei i moiushchikh sredstv; kratkii tekhniko-ekonomicheskii ocherk. Moskva, Pishchepromizdat, 1959. 88 p. (MIRA 13:2)

(Cleaning compounds)

FROLOV-BAGREYEV, A.M., prof., doktor sel'skokhoz.nauk; VECHER, A.S., prof., doktor biolog.nauk, spetsred.; BELIKOVA, L.S., red.; RESH, G.S., red.; GOTLIB, E.M., tekhn.red.

[Works in wine chemistry and production] Trudy po khimii i tekhnologii vina. Moskva, Pishchepromizdat. Vol.2. [Chemistry of grapes and products of their processing; selected articles] Khimiia vinograda i produktov ego pererabotki; izbrannye stat'i. 1959. 355 p. (MIRA 13:1)

(Wine and wine making) (Grapes)

BULGAKOV, N.; BELIKOVA, L.S., red.; KISINA, Ye.I., tekhn.red.

[Production and laboratory control of malting and brewing]
Proizvodstvennyi i laboratornyi kontrol' solodorashcheniia
i pivovareniia. Moskva, Pishchepromizdat, 1959. 406 p.
(MIRA 13:3)

(Malt) (Brewing)

BELOBORODOV, Vladimir Vital'yevich; BELIKOVA, L.S., red.; SOKOLOVA, I.A., tekhn.red.

[Methods for calculating the process of vegetable oil extraction] Metody rascheta protsessa ekstraktsii rastitel'nykh masel. Moskva, Pishchepromizdat, 1960. 115 p. (MIRA 14:4)
(Oils and fats)

ALAYEV, B.S.; MAN'KOVSKAYA, N.K.; SHIMAN, A.N.; BELIKOVA, L.S., red.;
GOTLIB, E.M., tekhn.red.

[Manufacture of synthetic fatty acids] Proizvodstvo sinteticheskikh zhirnykh kislot. Moskva, Pishchepromizdat, 1960. 122 p. (MIRA 13:7)

(Acids, Fatty)

NAKHMANOVICH, Mark Il'ich, prof., doktor tekhn.nauk; BELIKOVA, L.S., red.; PEREDERIY, S.P., tekhn.red.

[Reactions of monosaccharides] Reaktsii monosakharidov. Moskva, Pishchepromizdat, 1960. 168 p. (MIRA 14:3)
(Monosaccharides)

YASTREBOV, S.M.; MASSOVER, A.M.; LEMARIN'YE, K.P., kand. tekhn. nauk, red.; BELIKOVA, L.S., red.; KISINA, Ye.I., tekhn. red.

[Sterilization of canned food] Sterilizatsiia konservov. Pod red. K.P.Lemarin'e. Moskva, Pishchepromizdat, 1961. 67 p. (MIRA 14:9)

(Food, Canned--Sterilization)

ROZENBELOV, A.Ye.; LOKSHIN, Ya.Yu., kand. tekhn. nauk, retsenzent;
BELIKOVA, L.S., red.; SOKOLOVA, I.A., tekhn. red.

[Regulating can-closing machines] Regulirovanie zakatochnykh mashin. Moskva, Pishchepromizdat, 1961. 83 p. (MIRA 14:9)
(Canning industry—Equipment and supplies)

EMANYEL', N.M.; LYASKOVSKAYA, Yu.N., kand. tekhn. nauk; PETROV, N.A.,
kand. tekhn.nauk, spets. red.; BELIKOVA, L.S., red.; KISINA,
Ye.I., tekhn. red.

[Inhibition of the oxidation of fats] Tormozhenie protsessov
okisleniia zhirov. Moskva, Pishchepromizdat, 1961. 358 p.
(MIRA 14:9)

1. Chlen-korrespondent AN SSSR (for Emanyel').
(Oils and fats) (Oxidation)

IRODOV, Mikhail Vyacheslavovich, kand. tekhn. nauk; BELIKOVA, L.S., red.; SOKOLOVA, I.A., tekhn. red.

[Continuous reagent-free splitting of fats] Nepreryvnoe bezreaktivnoe rasshcheplenie zhirov. Moskva, Pishchepromizdat, 1961. 76 p. (MIRA 15:2)

(Oils and fats)

BEZZUBOV, Leonid Pavlovich; BUKHARIN, V.V., inzh., retsenzent;
RZHEKHIN, V.P., kand.tekhn. nauk, retsenzent; BELIKOVA, L.S.,
red.; SOKOLOVA, I.A., tekhn. red.

[Chemistry of fats]Khimiia zhirov. 2., izd. perer.i dop.
Moskva, Pishchepromizdat, 1962. 306 p. (MIRA 15:12)

1. Starshiy nauchnyy sotrudnik Vsesoyuznogo nauchno-issledovatel'skogo instituta zhirov (for Rzhekhin).
(Oils and fats)

MARKH, Aleksandr Tevevich; KRZHEVOVA, Ritta Vladimirovna; SABUROV,
N.V., prof., retsenzent; BELIKOVA, L.S., red.; SOKOLOVA,
I.A., tekhn. red.

[Chemical and technological control of the canning industry]
Khimiko-tekhnicheskii kontrol' konservnogo proizvodstva.
5. izd., perer. i dop. Moskva, Pishchepromizdat, 1962. 435 p.
(MIRA 15:10)

(Canning industry--Quality control)

KIROVA, Kira Aleksandrovna, dots., kand. tekhn. nauk; SLYUSARENKO, Tamara Platonovna, assistent; VESELOV, I.Ya., prof., retsenzent; PETRZHIKOVSKAYA, L.M., dots., retsenzent; BAKUSHINSKAYA, O.A., kand. biol. nauk, spets. red.; BELIKOVA, L.S., red.; SATAROVA, A.M., tekhn. red.

[Laboratory manual on microbiology in the food industry] Rukovodstvo k prakticheskim zaniatiiam po mikrobiologii pishchevykh proizvodstv. Moskva, Pishchepromizdat, 1961. 321 p. (MIRA 15:3)

(FOOD—MICROBIOLOGY)

BELIKOVA, M. [Bielikova, M.], inzh.; MIGACH, V. [Myhach, V.], inzh.

Autoclaved foamed concrete based on slag binding materials of the Dnieper Valley. Bud. mat. i konstr. 4 no.1:4-5 Ja-F '62. (MIRA 15:7)
(Dnieper Valley—Lightweight concrete)

BELIKOVA, M.K.

COUNTRY : USSR J
CATEGORY : Soil Science. Soil Biology.

ABS. JOUR. : RZhBiol., No. 4, 1959; No. 19365

AUTHOR : Dobrodvorskaya, O.M.; Belikova, M.K.; Gordiyenko, S.O.
INST. : Kiev Univ.
TITLE : Microorganisms in the Rhizosphere of Several Agricultural Cultures.

ORIG. PUB. : Nauk. zap. Kiivs'k, un-t, 1956, 15, No.11, 121-125

ABSTRACT : The quantitative and qualitative composition of microorganisms of the rhizosphere depends on the type of plant: in crop rotation the microflora is richer than the rhizosphere of lupines and perennial grasses; the smallest number of microflora is found in the rhizosphere of corn and cultivated cultures. The largest relative number of spore forms is observed in the rhizosphere of winter wheat and oats. The number and composition of the microflora of the rhizosphere

Card: 1/2

ODINTSOV, B.N., inzh.; BELIKOVA, M.S., inzh.

Lightweight concrete products made with lime-slag binders. Stroi. mat. 5 no.4:15 Ap '59. (MIRA 12:6)
(Lightweight concrete)

GOROSHKO, N.N.; KOZINA, M.P.; SKURATOV, S.M.; BELIKOVA, N.A.; PLATE, A.F.

Heats of combustion of exo- and endo-isomers of [illegible] 2-cyano-bicyclo-(2,2,1)heptane. Vest.Mosk.un.Ser.2:Khim. 19 no.4:3-6 Jl-Ag '64. (MIRA 18:8)

1. Kafedra fizicheskoy khimii Moskovskogo universiteta.

L 51812-65 EWT(m)/EPF(c)/EPR/EWP(j)/T/ Pc-4/Pr-4/Ps-4 WW/RM

ACCESSION NR: AP5017011 UR/0204/64/004/006/0819/0823

34
29
B

AUTHOR: Plate, A. F.; Gusar', N. I.; Belikova, N. A.; Steria, Kh. Ye.

TITLE: Hydrogenolysis and pyrolysis of bicyclo-(3,2,0)-heptane

SOURCE: Neftekhimiya, v. 4, no. 6, 1964, 819-823

TOPIC TAGS: heptane, hydrogenation, pyrolysis, catalysis, cyclic group

ABSTRACT: Hydrogenolysis of bicyclo-(3,2,0)-heptane on platinized charcoal begins at 100° and goes almost to completion at 150°, forming ethylcyclopentane (49%), cycloheptane (44%), and trans-1,2-dimethylcyclopentane (7%). In the presence of nickel-on-kieselguhr, complete hydrogenolysis of bicyclo-(3,2,0)-heptane takes place at 110°, resulting in the formation of ethylcyclopentane (50%), cyclopentane (20%), and trans-1,2-dimethyl-cyclopentane (28%). The carrier, kieselguhr, does not catalyze the conversion of bicyclo-(3,2,0)-heptane. Formation of the trans-isomer of 1,2-dimethylcyclopentane was explained by conversion of the cis-isomer originally formed, at the reaction temperature. In a study of the behavior of bicyclo-(3,2,0)-heptane under conditions of catalytic isomerization on platinized charcoal (in the absence of hydrogen), the hydrocarbon remained stable up to 250°, and cleavage of the cyclobutane

Card 1/2

L 51812-65

ACCESSION NR: AP5017011

5

ring occurred to an extent of only 14% at 350°. In the absence of a catalyst, pyrolysis does not begin at temperatures below 450°; at 500°, bicyclo-(3,2,0)-heptane is 15% decomposed, while at 550° the decomposition goes to completion. The pyrolysis products at 500°, after hydrogenation, contained the initial hydrocarbon, 6-7% cyclopentane, and 7-8% n-heptane. The pyrolyzate obtained at 550° represented a complex mixture: after hydrogenation, n-pentane, isopentane, cyclopentane, n-heptane, trans-1,2-dimethylcycloheptane, ethylcyclopentane, a few aromatic compounds, and the initial bicyclo-(3,2,0)-heptane were found; the gas formed in the decomposition contained 80% ethylene and an admixture of methane and hydrogen. Orig. art. has: 2 formulas, 3 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University); Komissiya po spektroskopii AN SSSR (Spectroscopy Commission, AN SSSR)

SUBMITTED: 12Jun64	ENCL: 00	SUB CODE: OC, GC
NO REF SOV: 006	OTHER: 002	JPRS

Card 2/2

BELIKOVA, N.A.; LEBEDEVA, K.V.; MEL'NIKOV, N.N.; PLATE, A.F.

Organic insectofungicides. Part 83.: Oxidation of some cyclic compounds by hydrogen peroxide. Zhur. ob. khim. 35 no.10: 1746-1752 O '65. (MIRA 18:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy.

BELIKOVA, N.A.

BELIKOVA, N.A.: "Investigation of the cyclic silico-hydrocarbons". Moscow, 1955. Acad Sci USSR, Inst of Organic Chemistry imeni N.D. Zelinskiy. (Dissertations for the Degree of Candidate of Chemical Sciences)

SO: Knizhnaya letopis' No 45, 5 November 1955. Moscow.

BELIKOVA, N.A

PLATE, A.F.; BELIKOVA, N.A.; YEGOROV, Yu.P.

Interaction of dialkyl-tetramethylene silanes and concentrated sulfuric acid. Dokl. AN SSSR 102 no.6:1131-1134 Je'55.
(MLRA 8:10)

1. Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR. Predstavleno akademikom B.A.Kazanskim
(Silane) (Sulfuric acid)

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26891.

concentrated H_2SO_4 in two directions - with
splitting the bond Si-C in the cycle and with
tearing the group CH_3 off. 0.7 mol of $(CH_3)_2$-
$SiCl_2$ in 1 lit of ether was added at 5° to 1.5-
$C_5H_{10}(MgBr)_2$ (of 1.5 mol of Mg) in 650 ml of
ether in order to prepare III, the mixture was
heated 15 hours and after the usual treatment
the yield of III was 26.7%. CH_4 (425 ml) sep-
arated, when 0.036 mol of III was shaken with
0.094 mo. of H_2SO_4 (13.5 hours, 20°); the
treatment of the mass with water resulted in
a mixture of disoloxanes - symm-tetramethyl-
di-n-amyldisiloxane and trimethyl-n-amylpenta-
methylenedisiloxane, yield of the mixture 85%,

boiling point 245-252°, $n^{20}D = 1.4430$, $d_4^{20} = 0.8681$.

Card 3/4

BELIKOVA, A.I.

MA

[illegible]

BELIKOVA, M.A.

Optical study of hydrocarbons. IX. Raman spectra of some naphthenes. P. A. Bazhulin, A. I. Sokolovskaya, M. A. Belikova, A. L. Liberman, and A. F. Plate (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1956, 1130-4; cf. *C.A.* 50, 3802a.—The following Raman spectra were detd. with very pure specimens of hydrocarbons. *cis*-1-Methyl-2-butylcyclopentane (cm.$^{-1}$), b_{760} 175°, b_{25} 73.7°, n_D^{20} 1.4381, d_{20} 0.7980; 277(8), 297(8), 372(5), 382(5), 423(3), 400(1), 501(3), 511(2), 620(2), 724(1), 758(9), 776(11), 805(5), 820(5), 836(8), 869(0), 888(29), 922(12), 946(0), 980(10), 1018(8), 1054(15), 1083(12), 1120(9), 1160(3), 1191(8), 1240(2), 1268(0), 1300(18), 1350(4), 1440(50), 1460(70), 1472(20), 2813(0), 2855(150), 2871(300), 2895(150), 2905(280), 2932(280), 2960(280). *trans*-1-Methyl-2-butylcyclopentane, b. 169.4-9.5°, b_{25} 74.0-4.1, n_D^{20} 1.4321, d_{20} 0.7847; 237(7), 249(7), 298(7), 333(5), 378(6), 404(0), 424(4), 504(9), 525(3), 552(4), 600(4), 762(2), 777(7), 798(2), 813(0), 878(8), 895(24), 905(16), 925(3), 937(2), 1001(8), 1033(4), 1050(0), 1084(11), 1093(11), 1128(9), 1185(7), 1220(2), 1242(0), 1270(3), 1298(13), 1343(8), 1377(4), 1441(30), 1450(50), 1461(40), 2771(5), 2854(300), 2862(300), 2908(240), 2923(200), 2940(240), 2960(270). *cis*-1-Methyl-4-ethylcyclohexane, b. 152.6°, n_D^{20} 1.4374, d_{20} 0.7869; 202(2), 305(0), 368(15), 392(3), 410(3), 443(10), 468(5), 489(4), 590(1), 631(31), 724(15), 753(34), 768(15), 781(32), 817(20), 895(4), 909(2), 951(5), 966(10), 1004(10), 1028(8), 1044(8), 1059(31), 1103(10), 1163(10), 1195(6), 1206(6), 1264(37), 1289(3), 1308(3), 1343(19), 1439(46), 1450(46), 2853(220), 2870(100), 2905(100), 2924(200), 2930(270), 2959(60). *trans*-1-Methyl-4-ethylcyclohexane, b. 149.1°, n_D^{20} 1.4204, d_{20} 0.7793; 201(0), Bazhulin, P.A.; Sokolovskaya, A.I.

242(0), 280(2), 306(5), 345(38), 378(1), 402[illegible], 440[illegible], 451(37), 477(23), 688(0), 754(65), 778(40), 841[illegible], 967(5), 991(8), 1014(5), 1031(10), 1069(65), 11[illegible], 1163(20), 1175(23), 1195(0), 1251(41), 1275(2), [illegible], a 1343(24), 1354(30), 1442(38), 1457(60), 2672[illegible] (290), 2873(100), 2909(160), 2932(240), 2958[illegible] [illegible] cyclohexane, b_4 123.5-3.7°, n^{25}_D 1.4464, d_4 [illegible]: 235(4), 406(2), 446(8), 495(0), 510(0), 524(0), [illegible], 770(19), 793(19), 811(4), 844(21), 894(4), 931[illegible], 979(5), 1033(36), 1053(6), 1082(10), 1104(6), 1128(6), 1157(8), 1182(2), 1203(0), 1261(28), 1301(16), 1348(1[illegible]), 1309(4), 1393?(2), 1445(75), 1466(10), 2667(5), 2728(2), 2842(20[illegible]), 2853(260), 2875(100), 2892(100), 2919(170), 2933(170), b 2959(50). Hexylbenzene (from AmMgBr and BzH, conversion of the carbinol to the acetate, its pyrolysis and hydrogenation), b_4 120.8-6.0°, n^{25}_D 1.4872, d_4 0.8576: 238(25), 259(5), 333(0), 394(0), 510(0), 520(0), 568(2), 604(2), 622(37), 749(23), 786(10), 802(5), 816(20), 842(6), 894(1), 893(7), 902(8), 936(0), 1003[illegible] [illegible] 10[illegible] 10[illegible] (8), 1113(14), 1155(22), [illegible], 1339(0), 1444(38), 1453(30), 1584(20), 1606(65), 2857(110), 2879(60), 2904(130), 2935(120), 2965(40), 3052(50), 3062(140), 3075(100). It is evident that [illegible] isomers c display a sufficient selection of Raman lines for pos. identification of the isomers. The specimens studied are probably contaminated by not more than 2-3% of the opposite isomers.

G. M. Kosolapoff

Fizicheskiy inst. im. P. N. Lebedeva i inst. organicheskoy Khimii im. N. D. Zelinskogo akademii nauk SSSR.
(Naphthenes - Spectra)

BELIKOVA, N. A.

27 7

Distr: 4E4j

Poisoning action of some silanes on platinum catalyst. A. F. Plate and N. A. Belikova (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Zhur. Obshchei Khim.* 27, 2460-73 (1957).—Small amts. of silanes, particularly cyclic ones, act as strong poisons on Pt catalyst when attempts are made to hydrogenate these substances over Pt-C at 300°. Me$_2$Si(CH$_2$)$_4$ is quite effective in this manner, with Me$_2$Si(CH$_2$)$_5$ being a somewhat less potent poison. The higher the temp. of the expt. the more rapidly does the poisoning appear. The kinetic curves of the effect are reproduced. G. M. K.

5

1

1/1

SOV/62-58-10-23/25

AUTHORS: Plate, A. F., Belikova, N. A.

TITLE: Isomerization of 2-Vinyl Bicyclo-(2,2,1)Heptene-5 Into the Tetrahydroindene System (Izomerizatsiya 2-vinilbitsiklo-(2,2,1)geptena-5 v sistemu tetragidroindena)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1958, Nr 10, pp 1279 - 1279 (USSR)

ABSTRACT: Recently the authors synthesized 2-vinyl bicyclo-(2,2,1) heptene-5 by means of the diene synthesis of cyclopentadiene with butadiene. The investiagtion of the properties of this compound showed that it is subjected to a new type of isomerization into the system of the tetrahydroindene. It was proved that the isomerisate has the carbon skeleton of the tetrahydroindene, which forms hydrindane in its hydration and indane in its dehydration. Judging from the three bands found in the infrared spectrum of the isomerisate within the 700-750 cm^{-1} range, and the four bands within the range 1600-1660 cm^{-1} (characterizing the oscillations of the C=C bonds) the isomerisate apparently is a mixture of two or three isomers with differently located double bonds. This isomerization

Card 1/2

Isomerization of 2-Vinyl Bicyclo-(2,2,1)Heptene-5 Into the Tetrahydroindene System SOV/62-58-10-23/25

did not take place by way of the decomposition stage (I) to the initial components (with subsequent interaction of cyclopentadiene dienophyl and butadiene diene) but it took place as a result of the break of the C-C bond between the endomethylene group and nucleus and a closing of a nucleus by the unification of the methylene group with the vinyl group. Then the stabilization of the biradical takes place.

ASSOCIATION: Institut organicheskoy khimii im.N.D.Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N.D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: June 27, 1958

Card 2/2

87526

S/079/60/030/012/009/027
B001/B064

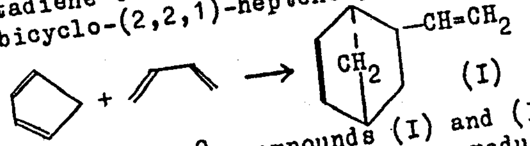
15 9201

AUTHORS: Plate, A. F. and Belikova, N. A.

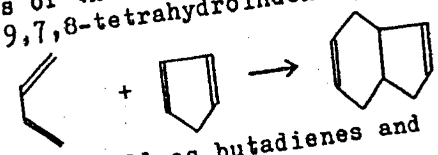
TITLE: Condensation of Cyclopentadiene With Aliphatic Dienes. I. Interaction Between Cyclopentadiene and Butadiene

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30. No. 12, pp. 3945-3953

TEXT: With consideration of the papers of Refs. 1 and 2 and of the US patent of Ref. 3 the authors show that the reaction of cyclopentadiene with butadiene can be used for the synthesis of the two dimers possible, 2-vinylbicyclo-(2,2,1)-heptene-5 (I) and 4,9,7,8-tetrahydroindene (II)



(I)



(II)

Between 140 and 200°C compounds (I) and (II) as well as butadienes and cyclopentadiene dimers and reaction products with higher molecular weights are formed. According to the temperature, mainly vinylbicyclo heptene (I) or tetrahydroindene (II) are formed, the former at lower and

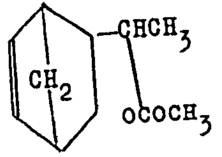
Card 1/4

87526

Condensation of Cyclopentadiene With Aliphatic Dienes. I. Interaction Between Cyclopentadiene and Butadiene

S/079/60/030/012/009/027
B001/B064

the latter at higher temperatures. 18.3% of vinylbicycloheptene and 6.2% of tetrahydroindene are formed on heating cyclopentadiene with butadiene for 3.5 hours at between 140 and 145°C. The tetrahydroindene yield increases with increased temperature, that of vinylbicyclo heptene decreases. 6% of the latter and 17% of the former are formed at 170°C during 5 hours, at 210°C, 22% of tetrahydroindene are formed during 2 hours; only traces of vinylbicycloheptene are obtained. The increased yield of tetrahydroindene with increased temperature is due to the capability of vinylbicycloheptene of isomerizing into tetrahydroindene (Ref. 4), at increased temperature. The pyrolysis experiment made by A. A. Petrov (Ref. 5) to obtain 2-vinyl bicyclo-(2,2,1)-heptene from acetate (III) led to cleavage products of acetate, i.e., to cyclopentadiene and butenol acetates. 2-vinyl bicyclo-(2,2,1)-heptene-5 reacts with phenylazide. On its hydration two hydrogen molecules are added with the known 2-ethylbicyclo-(2,2,1)-heptane (IV) (Ref. 6) being formed. The Raman spectra of 2-vinylbicyclo-(2,2,1)-heptene-5 distinctly show the characteristic



(III)

Card 2/4

87526

Condensation of Cyclopentadiene With Aliphatic S/079/60/030/012/009/027
Dienes. I. Interaction Between Cyclopentadiene B001/B064
and Butadiene

structural elements (bicycloheptene system and the vinyl group). The structure of tetrahydroindene (II) is proved by its hydration under formation of hydrindane (V). Fractional distillation combined with the chromatography of the 15 identical fractions obtained, showed that tetrahydroindene contains no impurities. The different stretching vibrations of the double bond of the Raman spectrum of tetrahydroindene could not be explained. Besides the codimers also high-molecular products are formed during the condensation of cyclopentadiene. Their composition shows that in the reaction with dienes the double bond in the bicyclo-(2,2,1)-heptene structure is more active than the vinyl double bond or the double bond in the six- or seven-membered ring. A table shows the properties of the hydrocarbons obtained in all reactions. The authors thank V. T. Aleksanyan and Kh.Ye. Sterin for taking the Raman spectra at the Komissiya po spektroskopii AN SSSR (Commission of Spectroscopy of AS USSR), and B. A. Rudenko from the authors' institute, for analyses. There are 2 figures, 1 table, and 16 references: 6 Soviet, 4 US, 5 German, and 1 British.

Card 3/4

Condensation of Cyclopentadiene With Aliphatic Dienes. I. Interaction Between Cyclopentadiene and Butadiene

87526
S/079/60/030/012/009/027
B001/B064

ASSOCIATION: Institut organicheskoy khimii Akademii nauk SSSR (Institute of Organic Chemistry of the Academy of Sciences USSR)

SUBMITTED: January 14, 1960

X

Card 4/4

87627
S/079/60/030/012/010/027
B001/B064

15.9201

AUTHORS: Plate, A. F. and Belikova, N. A.

TITLE: Condensation of Cyclopentadiene With Aliphatic Dienes. II. Interaction of Cyclopentadiene With Isoprene and 2,3-Dimethyl Butadiene-1,3

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 12, pp. 3953-3959

TEXT: In continuation of their previous paper (1) the authors investigated the condensation of cyclopentadiene with isoprene and 2,3-dimethyl butadiene-1,3. An experiment based on the data of the American patent (Ref. 2) proved that the cyclopentadiene condensation with isoprene during the first 3.5 months at room temperature gives a yield of only 2% of the final product, isopropenyl bicyclo (2,2,1) heptene-5 (I); the best yield of the latter was 7%, obtained at 140-145°C, with an only inconsiderable amount of the second co-dimer, methyl tetrahydroindene. At higher temperatures (between 185° and 200°C), 5-methyl-4,9,7,8-tetrahydroindene is the principal product (II) (23% yield); only traces of isopropenyl bicycloheptene are formed in this connection. This condensation can therefore be controlled. Cyclopenta-

Card 1/3

87527

Condensation of Cyclopentadiene With Aliphatic Dienes. II. Interaction of Cyclopentadiene With Isoprene and 2,3-Dimethyl Butadiene-1,3

S/079/60/030/012/010/027
B001/B064

diene plays the more important role under milder conditions, butadiene (or isoprene) under stricter ones. The presence of two double bonds in compound (I) was confirmed by Raman spectra and by selective hydrogenation of isopropenyl bicycloheptene under the addition of one mole hydrogen only (Scheme 3). The structure of the second co-dimer, 5-methyl tetrahydroindene, was confirmed by its dehydrogenation to 5-methyl indane (V), with hydrogenation of the latter to 5-methyl hydrindane (VI). 2,3-dimethyl butadiene-1,3 is not condensed with cyclopentadiene at 145-150° in contrast to butadiene and isoprene. Thus, dimethyl butadiene, which has two substituted double bonds proved to be an extremely weakly active dienophilic compound. Under stricter conditions (195-200°C), 5,6-dimethyl-4,9,7,8-tetrahydroindene (VII) (15% yield) resulted from 2,3-dimethyl butadiene-1,3 and cyclopentadiene. The structure of dimethyl tetrahydroindene was confirmed on the basis of its elementary analysis ($C_{11}H_{16}$), its Raman spectra, and physical constants. Its hydrogenation leads to 5,6-dimethyl hydrindane (VIII). The authors thank V. T. Aleksanyan and Kh. Ye. Sterin for the recording of the Raman spectra in the Komissiya po spektroskopii AN SSSR (Commission of Spectroscopy of the AS USSR). There are 3 figures, 2 tables, and 7 references: 3 Soviet, 2 US, 1 German, and 1 British.

Card 2/3

87527

Condensation of Cyclopentadiene With Aliphatic Dienes. II. Interaction of Cyclopentadiene With Isoprene and 2,3-Dimethyl Butadiene-1,3

S/079/60/030/012/010/027
B001/B064

ASSOCIATION: Institut organicheskoy khimii Akademii nauk SSSR (Institute of Organic Chemistry of the Academy of Sciences USSR)

SUBMITTED: January 14, 1960

Card 3/3

5.3400,5.1320

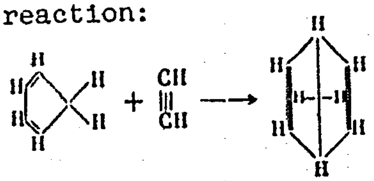
77659
SOV/80-33-2-34/52

AUTHORS: Belikova, N. A., Vol'fson, L. G., Kuznetsova, K. B., ~~Mel'nikov, N. N.,~~ Person, A. I., Plate, A. F., Pryanishnikova, M. A.

TITLE: Concerning the Isolation of Aldrin and Dieldrin

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 2, pp 454-463 (USSR)

ABSTRACT: The article describes the synthesis of aldrin and dieldrin based on information gathered from foreign patent literature and on the authors' studies of the basic reaction of hexachlorocyclopentadiene with bicyclo-(2,2,1)-heptadiene-2,5. The latter was synthesized in a continuous flow installation, according to the reaction:



Card 1/6

Concerning the Isolation of
Aldrin and Dieldrin

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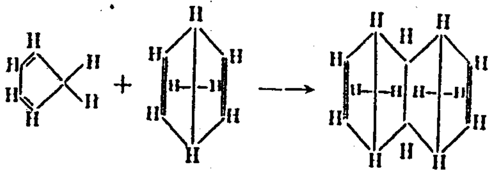
SOV/80-33-2-34/52

The optimum conditions for the above condensation of cyclopentadiene with acetylene were: molar ratio 1:1.1 to 1:2; temperature 345° C; pressure 20 atm. The yield of bicycloheptadiene under those conditions was about 48% and dropped sharply with rising temperature. The spent gas contained 95-97% acetylene and could be recycled. Investigation of the thermal stability showed that bicyclo-(2,2,1)-heptadiene-2,5 remained unchanged at 290° C, but under the conditions of the reaction it reacted with one cyclopentadiene molecule:



At 340° C and above, bicycloheptadiene was isomerized into cycloheptatriene; at 390° and 8 atm the extent of isomerization reached 20%, and a small amount of

Card 2/6

Concerning the Isolation of
Aldrin and Dieldrin

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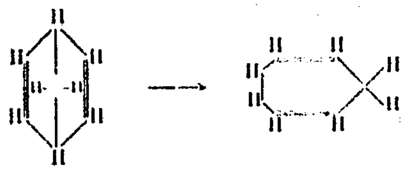
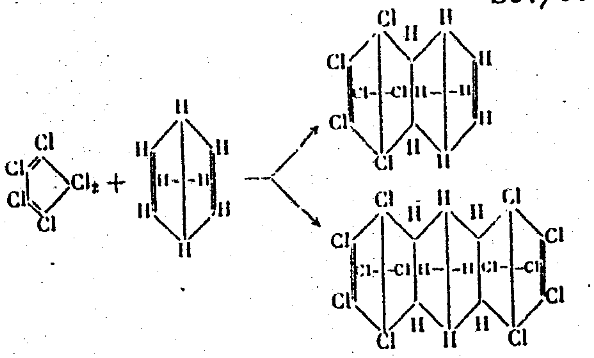
SOV/80-33-2-34/52

toluene (1%) was also formed.



The conditions governing the direction of the reaction of bicycloheptadiene with hexachlorocyclopentadiene in the synthesis of aldrin were investigated.

Card 3/6



It was found that the optimum conditions were as follows: molar ratio of the above reactants 2.5:1; time of reaction 18 hr; temperature 90-110° C. The complete synthesis of aldrin consisted of the following operations: (1) condensation of acetylene with cyclopentadiene; (2) distillation of the reaction products and separation of bicycloheptadiene; (3)

Concerning the Isolation of
Aldrin and Dieldrin

77659
SOV/80-33-2-34/52

Some experimental work was done by G. A. Tarasova at the Institute of Organic Chemistry, Academy of Sciences, USSR. Determination of combustion temperatures was made by M. P. Kozina and S. M. Shtekher at the Luginin Laboratory of Thermochemistry of Lomonosov Moscow State University. Cyclopentatriene analysis was made by M. Ye. Vol'pin at the Institute of Element-Organic Compounds, Academy of Sciences, USSR. There are 4 figures; 1 table; and 23 references, 9 U.S., 2 U.K., 1 Canadian, 1 Indian, 2 Swiss, 1 East German, 7 Soviet. The 5 most recent U.S. and U.K. references are: Handbook of Aldrin, Dieldrin, and Endrin Formulations, Shell Chemical Corp. (1954); J. Hine, J. A. Brown, L. H. Zalkow, W. E. Gardner, M. Hine, J. Am. Chem. Soc., 77, 3, 594 (1955); R. E. Lidov, U. S. Pat. 2635977, 21.IV.1953; B. Soloway, U.S. Pat. 2676131, 2.V.1954; R. E. Lidov, S. B. Soloway, Brit. Pat. 692547 (1954).

SUBMITTED: June 25, 1959
Card 6/6

S/204/61/001/004/004/005
E075/E185

AUTHORS: Plate, A.F., Belikova, N.A., and Kirichenko, S.Ya.

TITLE: Catalytic conversions of 1,4-endomethyleneoctahydronaphthalene and 1,4,5,8-diendomethylenedecalin

PERIODICAL: Neftekhimiya, v.1, no.4, 1961, 494-500

TEXT: The behaviour of 1,4-endomethyleneoctahydronaphthalene (I) and 1,4,5,8-diendomethylenedecalin (II) under heterogeneous catalysis conditions has been studied for the first time at the Moscow State University. Hodrocarbon I was prepared by condensing two parts of cyclopentadiene with one part of ethylene at 200 °C and 35 atm pressure. It was hydrogenated at 20-40 °C in the presence of suspended Ni catalyst to obtain hydrocarbon II. Hydrocarbon I was studied in the presence of a platinized carbon catalyst under conditions of dehydrogenation and irreversible catalysis (Zelinskiy method). Carbon with 8% platinum was used as the catalyst and the hydrocarbon vapours passed over it with space velocity of 0.2 h^{-1} at 205-210 °C. The reaction products yielded 1,4-endomethylene-1,2,3,4-tetrahydronaphthalene and 1,4-endomethylenedecalin; dehydrogenation, however, was hampered

Card 1/4

S/204/61/001/004/004/005
E075/E185

Catalytic conversions of ...

by side reactions, such as hydrogenolysis of the five-member ring,
marked by the presence of α-methylnaphthalene in the tail fraction.
As a result of the dehydrogenation the yield of
1,4-endomethylene-1,2,3,4-tetrahydronaphthalene was higher than
expected. Thus the ratio of the aromatic hydrocarbon to
1,4-endomethylenedecalin was 1:1 and not 1:2. The dehydrogenation
of hydrocarbon I in the presence of platinized carbon at 300 °C
gives the aromatic hydrocarbon only with 50% yield. Hydrocarbon II
was studied under platforming conditions over a 0.5% Pt/Al_2O_3·HF
catalyst at 480 °C and under a hydrogen pressure of 20 atm.
The reaction product was a hydrocarbon C_{10} to C_{12} mixture in the
155-273 °C boiling range, but secondary processes of dealkylation
and isomerization typical for platforming reactions also occur.
The experimental data lead to the following conclusions.
1) 1,4-endomethylenetetrahydronaphthalene participates in the
reaction of irreversible catalysis under dehydrogenation conditions.
2) 1,4,5,8-diendomethylenedecahydronaphthalene is unstable under
platforming conditions and converts to hydrocarbons of the
naphthalene and indan series.

Card 2/4

3) Under platforming conditions the C—C bonds in the endomethylene bridges of 1,4,5,8-diendomethylenedecahydronaphthalene undergo cleavage, which is not typical for bicyclo- (2,2,1)-heptane and its homologs under conditions of hydrogenation and dehydrogenation catalysis.

Acknowledgments are expressed to Yu.P. Yegorov for his assistance.

There are 1 figure, 1 table and 14 references: 5 Soviet-bloc and 9 non-Soviet-bloc. The four most recent English language references read as follows:

Ref.2: C.L. Thomas, Ind. Eng. Chem., v.36, 310, 1944.
Ref.3: S.B. Soloway, J. Amer. Chem. Soc., v.74, 1027, 1952.
Ref.13: R.A. Friedel, M. Orchin. Ultraviolet spectra of organic compounds. J. Wiley, N.Y., 1951.
Ref.14: Catalogue of infrared spectral data. Amer. Petrol. Inst., Research pr. 44, Nat. Bur. Stand., Washington, 1952.

Catalytic conversions of S/204/61/001/004/004/005
E075/E185

✓

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova, Kafedra khimii nefti (Moscow State University imeni M.V. Lomonosov, Department of Petrol Chemistry)

SUBMITTED: June 10, 1961

Card 4/4

24683
S/204/61/001/006/003/004
E075/E436

5.4600
11.1210

AUTHORS: **Belikova, N.A.**, Berezkin, V.G., Polak, L.S.

TITLE: Investigation of the recombination products of alkyl radicals in the liquid phase radiolysis of n-hexane

PERIODICAL: Neftekhimiya, v.1, no.6, 1961, 828-835

TEXT: The authors investigated the composition of dimeric products formed on γ-radiolysis of pure liquid n-hexane, with and without the addition of butylene, at +20 and -77°C. Five isomers of dodecane were synthetized (four of them for the first time) and used as calibration standards in the analysis of the products resulting from the combination of the following radicals: R_1 $CH_3(CH_2)_4\dot{C}H_2$; R_2 $CH_3(CH_2)_3\dot{C}HCH_3$ and R_3 $CH_3(CH_2)_2CHCH_2CH_3$. It was found that a decrease in the temperature of irradiation leads to a relative increase in the content of products of recombination of hexyl radicals with fragment radicals in $C_9 - C_{12}$ fraction. For the radiolysis in the presence of butylene there was a sharp increase in the absolute and relative content of saturated C_{10} hydrocarbons (to 43 - 49%) in $C_9 - C_{12}$ fraction. This effect was explained by the occurrence of the following

Card 1/3

S/204/61/001/006/003/004
E075/E436

Investigation of the recombination ...

reactions

$$C_4H_8 + \overset{\circ}{H} \longrightarrow C_4\overset{\circ}{H}_9 \qquad (1)$$

$$C_4\overset{\circ}{H}_9 + C_6\overset{\circ}{H}_{13} \longrightarrow C_{10}H_{22} \qquad (2)$$

It was established that thermal hydrogen atoms join the unsaturated products leading to the formation of aliphatic radicals. It was shown that concentrations of R_2 and R_3 at +20°C is about 3.5 times that of R_1 and that the concentration of R_2 and R_3 are equal. At -77°C, $R_2/R_1 \approx R_3/R_1 \sim 2$ and $R_2 \cong R_3$. The quantity of n-dodecane ($R_1 + R_1$) formed was 10 times less than that of products $R_1 + R_2$ and $R_1 + R_3$ at 20°C and 8 times less at -77°C, whilst the calculated concentration of R_1 was 3.5 and 2 times less than the concentrations of R_2 and R_3 respectively. By changing the temperature from +20 to -77°C the yield of isomers formed from the secondary radicals fell by 2.2 to 2.4 times and the yield of "primary" products almost did not change. There are 5 tables.

Card 2/3

S/204/61/001/006/005/004
Investigation of the recombination ... E075/E436

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
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Card 3/3

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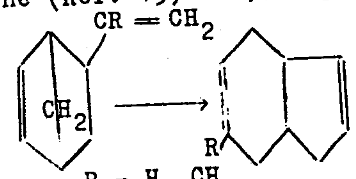
AUTHORS: Plate, A. F. and Belikova, N. A.

TITLE: Condensation of Cyclopentadiene With Aliphatic Dienes. III. Isomerization of 2-Vinyl- and 2-Isopropenyl-bicyclo-(2,2,1)-heptene-5 to the System of 4,9,7,8-Tetrahydroindene

PERIODICAL: Zhurnal obshchey khimii, 1961, Vol. 31, No. 1, pp. 131 - 136

TEXT: Taking Refs. 1 - 12 into account, the authors studied the thermal stability of 2-vinyl- and 2-isopropenyl-bicyclo-(2,2,1)-heptene-5 synthesized by them (Refs. 13 and 14). These compounds were found to have the specific property of isomerizing on being heated to 4,9,7,8-tetrahydroindene (Ref. 15) and, respectively, to 5-methyl-4,9,7,8-tetrahydroindene:



R = H, CH_3

These isomerizations to tetrahydroindene and 5-methyl-tetrahydroindene were confirmed by comparing the physical properties of the resultant compounds with those of the same compounds which had previously been obtained by condensation of cyclopentadiene with buta-

Card 1/3

Condensation of Cyclopentadiene With Aliphatic Dienes. III. Isomerization of 2-Vinyl- and 2-Isopropenyl-bicyclo-(2,2,1)-heptene-5 to the System of 4,9,7,8-Tetrahydroindene

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diene and isoprene (13, 14). Further evidence was given by the formation of indane on dehydrogenation of tetrahydroindene, and of methyl indane on dehydrogenation of isopropenyl-bicycloheptene-5. Different possible ways of isomerizing vinyl- and isopropenyl-bicycloheptenes to tetrahydroindene are discussed. The formation of the same 5-methyl-tetrahydroindene by condensation of cyclopentadiene with isoprene and by isomerization of 2-isopropenyl-bicycloheptene-5 suggests that both condensation and isomerization proceed via a common intermediate. The C-C bond is cleft according to O. Schmidt's rule, and the biradical A is isomerized to the biradical B, and then stabilized. A rise of the reaction temperature increases the tetrahydroindene yield on condensation of cyclopentadiene with butadiene, and, in turn, decreases the yield of vinyl bicycloheptene (Refs. 1, 3). This fact is due to the capability of the latter to isomerize to tetrahydroindene. It may be seen from a comparison of the tetrahydroindene yields obtained in the isomerization of vinyl bicycloheptene with the yields in the synthesis, that a certain part of tetrahydroindene appears as the primary product in the reaction of cyclopentadiene with

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Card 2/3

PETROV, A.D.; PLATE, A.F.; CHERNYSHEV, Ye.A.; DOLGAYA, M. Ye.; BELIKOVA, N.A.; KRASNOVA, T.L.; LEYTES, L.A.; PRYANISHNIKOVA, M.A.; TAYTS, G.S.; KOZYRKIN, B.I.

Preparation of organosilicon derivatives of bicyclo [2.2.1] heptane. Zhur. ob. khim. 31 no.4:1199-1208 Ap '61.
(MIRA 14:4)

1. Institut organicheskoy khimii Akademii nauk SSSR.
(Bicycloheptane) (Silicon organic compounds)

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AUTHORS: Vdovin, V. M., Pushchevaya, K. S., Belikova, N. A., Sultanov, R., Plate, A. F., and Petrov, A. D., Corresponding Member AS USSR

TITLE: Derivatives of Silanes With Hydrocarbon Bridges Between the Si Atoms. The Polymerization of 1,1-Dimethyl Silicocyclopentane

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp. 96-99

TEXT: The authors studied the effect of aluminum halides ($AlCl_3$ and $AlBr_3$ on 1,1-dimethyl silicocyclopentane. They regard the latter as a bridge compound in which both ends of the organic radical -R- are attached to the same silicon atom. Experimental results confirmed the authors assumption that, under the influence of AlX_3, the $\equiv Si - (CH_2)_4$ bonds would be more reactive than the $\equiv Si - CH_3$ bonds. As expected, this lead to formation of a reactive radical $-Si(CH_3)_2CH_2CH_2CH_2CH_2-$, and in the presence

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Card 1/3