"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

ADAMCHUK, V.K.; BERLAGA, R.Ya.

Photoionization in the region of fundamental absorption in cadmium selenide. Fiz. tver. tela 5 no.12:3529-3532 D '63. (MIRA 17:2)

1. Leningradskiy gosudarsvennyy universitet.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

ACCESSION NR: AP4024465 S/0054/64/000/001/0159/0162

AUTHORS: Berlaga, R. Ya.; Rudenok, M. I.

TITLE: Surface structure, electric, and photoelectric properties of thin lead sulphide layers obtained by the cathode-sputtering method

SOURCE: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1964, 159-162

TOPIC TAGS: lead sulphide layer, cathode sputtering, activation energy, adsorption spectrum, electron diffraction, vacuum evaporation, single crystal PbS film

ABSTRACT: Thin PbS layers were produced by the cathode-sputtering method under a bell jar at 10^{-1} to 5×10^{-2} mm Hg pressures and at temperatures of 250-270C. Average evaporation rate was 0.2 μ per hour; the substrate was at a 3.5-4 cm distance from the cathode. The activation energy was calculated from temperature dependence of conductivity using both the cathode sputtering technique and evaporation in vacuum with noticeable differences in the measured conductivity between the two methods. The adsorption spectrum was measured in thin polycrys-

Card 1/2

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

ACCESSION NR: AP4024465

stalline layers of PbS obtained by the cathode sputtering method. Electron microscopic and electron diffraction studies were carried out. The PbS layers obtained exhibit the same properties as the layers produced by the vacuum evaporation method. The ability to produce polycrystalline and single crystal PbS films is shown to be possible by the cathode-sputtering method. "L. I. Meshcherskaya took part in the experiments." Orig. art. has: 5 figures.

ASSOCIATION: none

SUBMITTED: 02Jul63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 000 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLAGA, R.Ya.; RUDENOK, M.I.

Surface structure, electric and photoelectric properties of thin PbS films produced by cathode sputtering. Vest. LGU 19 no.4: 159-162 '64. (MIRA 17:3)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65 EWT(1)/EWG(k)/EWT(m)/EEC(t)/EWP(t)/EWP(b) Pz-6 IJP(c)/ESD(gs)
RDW/JD/AT

ACCESSION NR: AP4047342 S/0139/64/000/005/0018/0020 B

AUTHORS: Artamonov, O. M.; Berlaga, R. Ya. (Deceased); Berlaga, R. Ya.

TITLE: Investigation of the transverse photo-emf in polycrystalline layers of CdTe

SOURCE: IVUZ. Fizika, no. 5, 1964, 18-20

TOPIC TAGS: cadmium telluride, photoeffect, polycrystal, surface potential

ABSTRACT: To check on the light-stimulated variation of the surface potential of polycrystalline layers of CdTe rel[illegible] strate [illegible] investigated simultaneous [illegible] the layer ($E_{\parallel}$) and the light-induced variation [illegible] the layer ($E_{\perp}$). The investigated [illegible] were 0.25--2.5 μ thick and were deposited in accordance with the tech-

Card 1/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

nology described by V. A. Lyubin and G. A. Fedorova (DAN SSSR v. 135, No. 4, 833, 1960) on a 25 x 70 mm glass substrate [illegible] semitransparent layer of gold. $\Delta E_{\parallel}$ was measured by the [illegible] pacitor and by the capacitor methods, the light being modulated in the latter case at 200 cps. $E_{\parallel}$ was measured by a potentiometer method, using a dynamic capacitor with a tuned amplifier as a null indicator. Typical spectral curves of the transverse effect are shown in Figs. 1 and 2 of the enclosure. The results show that the longitudinal and transverse effects have much in common in their spectral characteristics, time delay, and dependence on the illumination. However, the available experimental facts cannot be explained by simply assuming that $\Delta E_{\perp}$ and $E_{\parallel}$ are projections of the same electric vector, and not all the processes which lead to a change in the surface potential make a noticeable contribution to the longitudinal photoeffect. Orig. art. has: 2 figures.

Card 2/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

ASSOCIATION: Leningradskiy gosuniversitet imeni A. A. Zhdanova (Leningrad State University)

SUBMITTED: 04May63 ENCL: 02

SUB CODE: IC, OP NR REF SOV: 003 OTHER: 003

Card 3/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

ENCLOSURE: 01

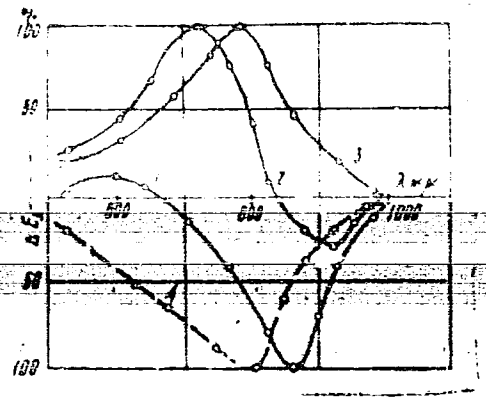

Fig. 1. Typical spectral curves of the transverse photo-emf normalized to their maximum in per cent. Curves 1, 2 and 3 pertain to thicknesses 0.29, 1.1, and 2.7 μ. 4 - typical spectrum for the same layers, but illuminated from the opposite side.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

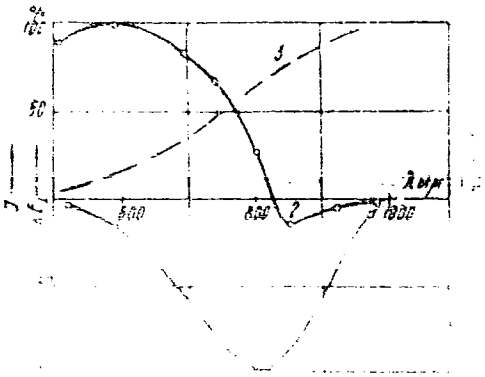

Fig. 2. Typical spectral curves of the [illegible]

[illegible]

Card 5/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65 EWT(1)/EWG(k)/EWT(m)/EEC(t)/EWP(t)/EWP(b) Pz-6 IJP(c)/ESD(gs)
RDW/JD/AT

ACCESSION NR: AP4047342 S/0139/64/[illegible]

AUTHORS: Artamonov, O. M.; Barlaga, P. Ya. ([illegible])

TITLE: Investigation of the transverse photo-emf [illegible] layers of CdTe

SOURCE: IVUZ. Fizika, no. 5, 1964, 18-20

TOPIC TAGS: cadmium telluride, photoeffect, polycrystal, surface potential

ABSTRACT: To check on the light-stimulated variation of [illegible] potential of polycrystalline layers of CdTe rel[illegible] [illegible] investigated sim[illegible] [illegible] the light [illegible] the surface of the layer ($\Delta E_{\perp}$). The investigat[illegible] 0.25--[illegible] thick and were deposited in accordance with [illegible]

Card 1/3

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

I. 12430-65
ACCESSION NR: AP4047342

nology described by V. A. Lyubin and G. A. Fedorova (DAN SSSR [illegible] 135, No. 4 833, 1960) on a 25 x 70 mm glass substrate [illegible] semitransparent layer of gold. $\Delta E_{\parallel}$ was measure[illegible] [illegible] and [illegible] the capacitor methods, the light [illegible] the latter case at 200 cps. $E_{\parallel}$ was measured by a potentiometer method, using a dynamic capacitor with a tuned amplifier [illegible] a special [illegible]

longitudinal and transverse effects have much in common in their [illegible] characteristics, time delay, and [illegible] the available experi[illegible] assuming that $\Delta E_{\perp}$ and $\Delta E_{\parallel}$ [illegible] same electric vector, and not all the processes which lead to a change in the surface potential make a noticeable contribution to the longitudinal photoeffect. Orig. art. has: 2 figures

Card 2/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

ASSOCIATION: Leningradskiy gosuniversitet imeni A. A. Zhdanova (Leningrad State University)

SUBMITTED: 04May63 ENCL: 02

SUB CODE: IC, OP NR REF SOV: 003 OTHER: 003

Card 3/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65

ACCESSION NR: AP4047342

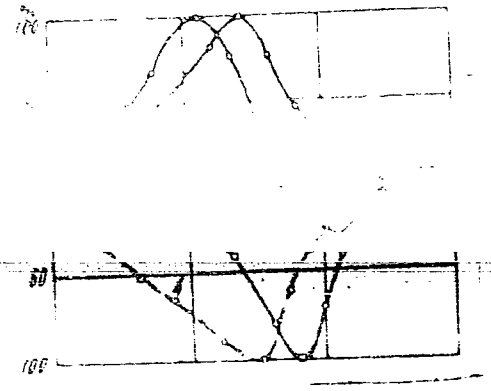

Fig. 1. Typical [illegible]

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

L 12430-65
ACCESSION NR: AP4047342

ENCLOSURE: 02

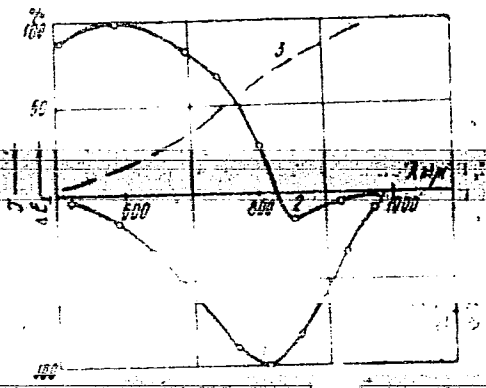

Fig. 2. Typical spectral curves of the transverse photo-emf (normalized to their maximum in per cent [illegible] the capacitor method, 3 - spectral characteristic of illumination source.

Card 5/5

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESKU, ELENA, Cand Med Sci -- (diss) "~~Curing~~ Treatment of hyperthyroosis patients ~~with hyperthyrosis with~~ by means of radon baths." Mos 1958

16 pp (Min of Health RSFSR. State Sci Res Inst of ~~Thermal~~ Health Resort Science ~~Curing~~ and Physiotherapy) 250 copies (KL, 32-58, 111)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESKU, Elena [BERLESCU, Elena] (Rumyniya)

Treatment of first- and second-degree hyperthyroidism with radon baths. Vop.kur.fizioter. i lech.fiz.kul't 23 no.4:345-351 Jl-Ag '58 (MIRA 11:8)

1. Iz terapevticheskoy kliniki (nauchnyy rukovoditel' - prof. N.I. Speranskiy) TSentral'nogo instituta kurortologii (dir. - kand.med. nauk G.N. Pospelova).

(HYPERTHYROIDISM)
(RADON--THERAPEUTIC USE)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESCU, Elena [Berlescu, Elena]

"Transactions of the Bucharest Institute of Balneology and Physical Therapy," [in Rumanina]. Reviewed by Elena Berlescu. Vop.kur. fizioter. i lech.fiz. kul't. 23 no.6 550-553 N-D '58 (MIRA 11:12)
(RUMANIA--HEALTH RESORTS, WATERING PLACES, ETC)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESKU, E., doktor

"Balneologic physical therapy in rheumatic diseases". Reviewed by E.Berlesku. Vop. kur., fizioter. i lech. fiz. kul't. 26 no.5: 471-472 S-O '61. (MIRA 14:11)

(RHEUMATIC FEVER) (PHYSICAL THERAPY)
(HYDROTHERAPY)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESKU, E.

"Balneo- and physiotherapy in diseases of the digestive tract." Reviewed by E.Berlesku. Vop. kur., fizioter. i lech. fiz. kul't. 26 no.6:559-562 N-D '61. (MIRA 15:1)
(DIGESTIVE ORGANS--DISEASES) (PHYSICAL THERAPY)
(BATHS)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BINSTOC, O., dr.; BERLESCU, Elena, dr.; DUMITRESCU, St., dr.

Considerations on the cervicohumeral syndrome. Med. intern. 15 no.7:839-842 Jl '63.

(SPINAL DISEASES) (ARTHRITIS, RHEUMATOID)
(PERIARTHRITIS) (CERVICAL VERTEBRAE)
(SHOULDER ARTHROSES) (NEURALGIA)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESCU Elena; BADESCU, Maria; GEORGESCU, Gh.; TOMA, E.

Value of the Hamolsky test for the dynamic follow-up of thyroid functional changes caused by sulfurous balne therapy at the Herculane spa. Stud. cercet. endocr. 15 no.4 333-339 '64.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

LUNGU, Al.; TACHE, Alina; BERLESCU, Elena; CRISTOVEANU, Ana; NICOLAU, Gratiela; SCHULLER, A.

Hormonal changes during physiotherapy of patients with excess weight. Studii cercet. endocr. 16 no.2:175-180 '65.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLESKU, E. [Berlescu, E.]; LUNGU, A.; KRISTOVYANU, A. [Christoveanu, A.]; SHULLER, A. [Suller, A.]; STOYCHESKU, K. [Stoicescu, K.]; MIKHESKU, R. (Rumyniya)

Effect of meteorological factors on the function of the adrenal cortex during balneotherapy. Vop. kur., fizioter. i lech. fiz. kul't. 29 no.4: 316-322 Jl-Ag '64. (MIRA 18:9)

1. Institut endokrinologii imeni Parkhona (dir. - akademik Sht. I. Milku [Milcu, S.] i Institut bal'neologii i fizioterapii (dir. - prof. T.Dinkulesku [Dinculescu, T.]), Bukharest.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLEYEV, G.I.

"Direct Current Amplifiers," G.I. Berleyev
Usp Fiz Nauk, vol. 49, no. 1, 93-193, Jan 1953

Describes several dc amplifiers of the Wheatstone bridge type and of electrometric tube type and their applications. Appends 51 references, half U.S. and British.

254T60

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLEYEV, G. I.

Dissertation: "Investigation Into the Physical Processes in DC Amplifiers and the Development of Methods of Using Them for Measuring Physical Quantities." Cand Phys-Math Sci, Physics Inst imeni P. N. Lebedev, Acad Sci USSR, 7 Jun 54. Vechernyaya Moskva, Moscow, 28 May 54.

SO: SUM 284, 26 Nov 1954

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLEYEV, G.I.

Direct current differential bridge. Izv.AN Kir.SSR no.1:61-67 '55.
(Electric measurements)(Thermometry) (MLRA 9:9)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLEYEV, Grigoriy Isayevich; IVANOV, I.A., red.

[Problems and questions in physics; for technical schools] Sbornik zadach i voprosov po fizike; dlia tekhnikumov. Moskva, Vysshaia shkola, 1964. 302 p. (MIRA 17:9)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLEYEV, I.I.

Wasteless layout of wood. Der.prom. 6 no.7:27 Jl '57. (MLRA 10:8)

1.Tiraspol'skaya mebel'naya fabrika No.4.
(Woodwork)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

S/503/62/015/000/002/003
A001/A101

AUTHORS: Karimov, M. G., Antushevich, M. I., Berlikenova, K. M., Dosybayev, S. K., Zubtsov, A. S.

TITLE: Photometry of solar flares according to observations of the coronal station near Alma-Ata during 1960 - 1961

SOURCE: Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Izvestiya. v. 15, 1962, 77 - 110

TEXT: The present article is a continuation of the study of the same authors published in 1962 in the v. 14 of the same source. Film frames were taken in intervals of 30 sec, sometimes 15 sec and one minute. Prior to photometrical processing all frames of the flares were preliminarily examined, and flares were selected which had characteristical peculiarities in some features. During two years 63 flare photographs were selected, carefully processed and the data are tabulated. For individual, most pronounced knots are plotted curves of flare development. The graphs in the article contain information on intensity of individual knots, expressed in terms of intensity of undisturbed places of

Card 1/2

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the solar disk, versus time of flare development and changes in the area of flares. Both quantities, ratios of intensities and areas are plotted on ordinates, the first on the left-hand side and the second on the right-hand side; abscissa serves as time coordinate for both quantities. The upper right-hand corner of figures contains a sketch of the flare with all its details, sunspots, flocculi, foci of flares, etc. The photometric study of the flares shows that their existence strongly depends on the center of activity. They have a special relation to sunspots and flocculi fields. Curves of variations of brightness and area have a series of characteristical features where this relation is close. There are 62 figures and 1 table.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A., inzh.; MOROZOV, V., inzh.; AKHENSHTEYN, G., inzh.

From material sent to the editor. Na stroi. Ros. 4 no.5:25 My '63. (MIRA 16:5)

(Construction industry)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

9a

10

Camphor. A. B. Davankov, A. A. Berlin and O. A. Konovalova. Russ. 58,123, June 30, 1930. Camphor is formed by oxidizing camphene with $K_2Cr_2O_7$ + H_2SO_4 mixt. in the presence of 0.1–1.5% of HNO_3, nitrite or nitrate.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

B-II-5

Acetylation of wood cellulose and preparation of cellulose acetate films from the product. A. B. Davanzov and A. A. [illegible] (Proc. Org. Chim., 1939, 9, 244–249).—Sulphite cellulose is soaked for 20 hr. in a 2 : 3 AcOH–Ac_2O mixture, 0·06 pt. of H_2SO_4 is added, and the system held at 50° for 3 hr.; the product is readily sol. in 1 : 5 EtOH–$CHCl_3$ and contains 62% of bound AcOH. The prep. and properties of plastics based on this product are described.

R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

10

Methods for the production and polymerization of α,β-unsaturated ketones. A. A. Berlin. *Uspekhi Khim.* 8, 1849-61(1939).—Review of the scientific, tech. and patent literature.

F. H. Rathmann

COMMON ELEMENTS

COMMON VARIABLES INDEX

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

0A

10

Activation of the oxidation of camphene. A. B. Davankov and A. A. Berlin. *J. Applied Chem.* (U. S. S. R.) 12, 1399-1406(in French, 1406)(1939).—The oxidation of camphene with the $K_2Cr_2O_7$-H_2SO_4-H_2O mixt. is not a very efficient operation. The activation of the process with H_2O_2, perchromic acid, HNO_3 and $NaNO_3$ was investigated. HNO_3 and $NaNO_3$ were the most effective catalysts. The oxidation of camphene was carried out with the mixt. of $K_2Cr_2O_7$ 8, H_2SO_4 22.5 and water 69.5% at an initial temp. of 70° and a final temp. of 90°. The amts. of HNO_3 (100%) or $NaNO_3$ used should not be more than 6 g. per 100 cc. of the oxidation mixt. and 14.6% by wt. of $K_2Cr_2O_7$, resp. The oxidation was carried out in 4-6 cycles. Both of the above catalysts decreased the time of oxidation and increased the yield of camphor. Thus the oxidation of camphene in the presence of $NaNO_3$ yielded 70% of camphor, m. 162°, in 10 hrs. The camphor so obtained contained 2.09% camphene. The oxidation of camphene under conditions approximating those which are used in the industry was also carried out in the presence and absence of $NaNO_3$. The yield of camphor was 88.1 and 88.6% resp., disclosing that an oxidation with the somewhat dild. mixt. took place although it required more time (22.5 and 34 hrs., resp.), but the amt. of $K_2Cr_2O_7$ used was smaller than in the oxidation with the concd. mixt. The evolution of CO_2 during the reaction was observed and is explained by the direct oxidation of camphene to CO_2.

A. A. Polgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

CA

Plastic masses. A. B. Davankov and A. A. Berlin. Russ. 50,745, March 31, 1940. As a base for plastic masses is used acetylcellulose contg. 40-50% acetic acid.

B

ASB-ILA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

1ST AND 2ND ORDERS | 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

2

Three-dimensional macromolecules. A. A. Berlin. *Uspekhi Khim.* 9, 642-72(1940).—Review. Styrene, butadiene, divinyl, chloroprene, natural and synthetic rubber and acrylic acid macromols. and their formation by polycondensation of like or unlike mols. by polymerization, by union, etc., and the modern theories of these three-dimensional reactions are discussed. F. H. R.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

Polymerization of certain keto alcohols. I. Preparation and polymerization mechanism of butan-1-ol-3-one. B. N. Rutovskii, A. A. Berlin and K. Zabyrina. *J. Gen. Chem.* (U. S. S. R.) 11, 850-8(1941).—The authors studied the polymerization mechanism and the properties of the polymers of butan-1-ol-3-one and of some of its homologs. The keto alc. may conceivably polymerize in 3 ways: (1) as a polyacetal, (2) as Me vinyl ketone (preceded by H_2O loss), and (3) as a product of enolic double-bond shift. The 1st theory is untenable because not only does an acid medium prevent polymerization of the keto alc. but it actually tends to decomp. the monomer. The 2nd theory is also untenable because no H_2O is evolved in the process, dehydrating agents do not aid polymerization and the polymer differs greatly from polymerized Me vinyl ketone, being superior to the latter in heat- and light-stability and in solv. in alcs. and alc.-benzene mixts. A reaction scheme which agrees with the observed facts is: $Me_2COCH_2CH_2OH \rightarrow MeC(OH):CHCH_2OH \rightarrow CH_2:C(OH)CH_2CH_2OH \rightarrow [\ldots CH_2C(OH)(CH_2CH_2OH)\ldots]_n$. The ketobutanol was prepd. essentially according to Merling and Köhler (cf. *C. A.* 5, 2305). It was found that for best yields very pure Me_2CO is necessary; the pH during the reaction should not exceed 8.2; a lower pH is also undesirable; the optimum reaction temp. is 30-5°; and, finally, after completion of the reaction the pH should be lowered to 6.8 and the volatile products distd. off immediately. Pure butan-1-ol-3-one (I) b_{11} 90-1°. The influence of heat on I was studied by measuring changes of n and viscosity of sealed samples heated in the range 50-140°. No great change was observed under 80° when dehydration appears to begin, while another rapid change occurs at 140°, probably due to a chem. change of I. Various catalysts were tried by heating I with 1% by wt. of the catalyst at 80° for 10 hrs. with examn. of the samples every 4 hrs.; the catalysts tried were: $ZnCl_2$, P_2O_5, H_2O_2, Br_2O_2, Ac_2O, NaOH, and Na_2O_2. The 1st four had a very small effect on the polymerization as shown by n and viscosity, Ac_2O was somewhat more effective, while the alk. catalysts were exceedingly powerful. NaOH yielded a sol. yellow-red polymer, while Na_2O_2 gave an opaque, insol., infusible yellow polymer. Dil. HCl and Ac_2O in amts. exceeding 1% by wt. of I favor decompn. of I, while acetylation of I occurs with Ac_2O. Increase of the concn. of alk. catalyst was found to increase the polymerization velocity. The enolisation theory is supported by the greatly inhibited polymerization of 2-methylbutan-1-ol-3-one under similar conditions as used for I, while 2,2-dimethylbutan-1-ol-3-one does not polymerize. Calcn. of the percentage of enol form made by several methods gave 75-80.7% (depending upon the method used) at 20°. Conditions for polymerization of I were studied by heating it with Br_2O_2 in 1.2 and 4% (by wt.) amts. at 80° for 36 hrs. The polymer is a viscous sirup which ppts. as white filaments on treatment with H_2O. Increase of the catalyst concn. hastens polymerization but lowers the polymer viscosity by 25-30% (catalyst change 1.2% to 4%). The polymer is colorless, heat-stable to 265-70°, softening at 240°. The alkali-catalyzed polymer is pptd. (by H_2O) as bright yellow threads which soften at 180° and is a polymer of inferior quality.

G. M. Kosolapoff

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

Ca

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Preparation of some *N*-acetyl derivatives of imine compounds. A. A. Berlin. *J. Gen. Chem.* (U.S.S.R.) 14, 438-46(1944)(English summary).—Several methods were used in acetylation of carbazole, as follows. Five g. carbazole and 5 g. Ac_2O were heated in a sealed tube to 200-70° for 7 hrs., poured into water on cooling, and the solid recrystd. from EtOH to yield 92-2.5% *9-acetylcarbazole* (I), m. 68-9°. Carbazole (80 g.) and 120 g. Ac_2O were treated with 2 drops of concd. H_2SO_4 and heated on a steam bath for 1 hr., to yield 90-2% I; similar results are obtained when 0.5-1.0% $FeCl_3$ is used as catalyst, while 1 drop of 30% $HClO_4$ added to the above mixt. yields, at room temp. in 3-4 min., 94-6% of I. Pyrrole (5 g.) and 15 g. Ac_2O treated with 0.12-0.14 g. 30% $HClO_4$ and kept at 70-80° yield a mixt. of *1- and 2-acetylpyrroles*, the ratio between them being detd. by the duration of heating (longer period yields more 2- and less 1-Ac deriv.); the isomers are sepd. by distn. (1-, b. 180-4°, 2-, b. 210-12°), the combined yields reaching a max. of 30% at a 4-hr. heating period. Ph_2NH in Ac_2O catalyzed by a drop of $HClO_4$ and heated for 6-8 min. to 80-90° gave 98.5-99% *N-acetyldiphenylamine*, m. 100-1° (from water); other catalysts require 2-4 hrs. heating for comparable yields. G. M. Kosolapoff

Synthesis of *bc*-quinolylcarbinols. V. M. Rodionov and M. A. Berkenheim. *J. Gen. Chem.* (U.S.S.R.) 14, 501-4 (1944)(English summary); cf. *C.A.* 39, 4076[9].—8-Quinolinecarboxaldehyde (1.8 g.), 2.9 g. formalin, 2.5 cc. water, and 4.8 cc. 40% KOH were mixed with spontaneous temp. rise to 40°, and let stand overnight, extd. with $CHCl_3$, the latter shaken in turn with bisulfite soln., Na_2CO_3 soln., and water, dried over Na_2SO_4, and evapd. to yield 82% *8-quinolylcarbinol* m. 74-6°. Similarly, 7-quinolinecarboxaldehyde gave 70% *7-quinolylcarbinol*, m. 68-9° (from benzene); 6-quinolinecarboxaldehyde gave a similar yield of *6-quinolylcarbinol*, m. 79.5-80.5° (from benzene); 5-quinolinecarboxaldehyde gave only *impure 5-quinolylcarbinol*, m. 130-7°, which was still contaminated with some aldehyde (the work was apparently interrupted by the war and not completed as yet). G. M. K.

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Influence of salts of hydrobromic acid on the yields of diacetylcarbazole, prepared by the Friedel-Crafts reaction. A. A. Berlin. *J. Gen. Chem.* (U.S.S.R.) 14, 1099-1100(1944)(English summary). It was shown that 80-4% yields of 1,9-diacetylcarbazole may be obtained from 9-acetylcarbazole with AcCl and $AlCl_3$ catalyst, provided that 0.05-0.1 molar amt. of $CaBr_2$ or $MgBr_2$ is present in the mixt. The ingredients are best mixed with cooling, and the reaction carried out by heating to 55-60° for 2 hrs.; the solvent used was CS_2. The same principle applied to AcPh synthesis gave 51% yields at a reaction temp. 50-60°. The beneficial action of bromides is greater when com. $AlCl_3$ than when sublimed $AlCl_3$ is used. Similarly Ph_2CO was prepd. in 61% yield when the Friedel-Crafts reaction was run in the presence of bromides; without such addends, the yield was 50.5%. The proposed mechanism consists of double decompn. with the acyl chloride to give the more reactive acyl bromide. The most active bromides are those of metals of the second and third groups.

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Ca

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Activation of oxidation of camphene. II. Oxidation of camphene in emulsions. A. A. Berlin, A. B. Davankov, and L. E. Kalliopin (Moscow Chem. Tech. Inst. Mendeleeva). *J. Applied Chem.* (U.S.S.R.) 16, 217-20(1943) (English summary); cf. *C.A.* 34, 3254'.—Oxidation of camphene by H_2CrO_4-H_2SO_4 at 80-90° in the presence of 2.5% naphthenesulfonic acids as emulsifiers proceeds 1.5-2.0 times more rapidly than does the reaction without emulsification, with a yield increase of 5-7% at this temp. and up to 15% at 60-70°. The yields of camphor range from 70% at 80-90° to 80% at 60-70°. G. M. K.

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PROCESSES AND PROPERTIES INDEX

Nonsoftening plastics. A. A. Berlin and I. S. Rez. U.S.S.R. 66,821, Aug. 31, 1946. Plastics made by hot-pressing lignin satd. with cyanamide, dicyanodiamide, thiourea, melamine, or a combination of these are heated at around 150° for 10 min. per mm. thickness. Plastics and lignin treated thus acquire improved strength, hardness, and water-resistance. Articles molded from such products retain their shape up to 200–50°. M. Hosch

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Plastic laminated wood. A. A. Berlin. U.S.S.R. 67,247, Oct. 31, 1946. Plywood sheets are satd. with a soln. of cyanamide, dicyanodiamide, thiourea, melamine, or a mixt. of these, cemented with a thermoreactive or thermoplastic resin, and pressed at approx. 100°. The product has high tensile and impact strengths, is resistant to fire, water, and gasoline, and is not easily penetrated by bullets. At 140-60° it can be molded, bent, and pressed readily.

M. Hosch

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Frothy materials having a polymerized or polycondensed resin base. A. A. Berlin and M. V. Sobolevskii. *Khim. Prom.* 1946, No. 10, 13-15.—Frothy materials were prepd. from polychlorovinyl, perchlorovinyl, polystyrene, and polymethyl methacrylate. As frothing substances were used inorg. and org. compds. liberating NH_3, N_2 + CO_2 on heating. The frothy products had closed pores the size of which could be regulated at will. The sp. gr. of the product was detd. by the quantity of the pore-forming material used. Addn. of plasticizer considerably reduces the quantity of pore-forming substance needed to obtain the same sp. gr. The mech. properties of the frothy plastics were very satisfactory. M. H.

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BERLIN, A.A.

Chemistry and technology of fluorine organic compounds. Khim. prom. no.10:305-312 O '47. (MLRA 8:12)
(Fluorine organic compounds)

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

7

Rapid determination of dicyanodiamide. A. A. Berlin and Z. A. Zinov'eva. *J. Gen. Chem.* (U.S.S.R.) 17, 43-50(1947)(in Russian).—A rapid and accurate detn. of dicyanodiamide (I) by means of hydration in acid soln. to guanylurea salts was developed. When I is heated on a steam bath (80-8°) for 15 min. with 10 parts of 2 *N*, *N*, and 0.5 *N* H_2SO_4 the hydration is 88-90% complete in the first 2 concns. but is incomplete in 0.5 *N* acid. The solns. after hydrolysis were made up to 250 cc. and were titrated with 0.03 *N* $Ca(OH)_2$ or 0.05 *N* NaOH, potentiometrically or with methyl orange indicator; in the former case the Sb electrode was most satisfactory. The 0.05 *N* NaOH gave somewhat sharper end points. The results calcd. to I had to be multiplied by the factor 1.06 with the potentiometric titration and 1.09 with methyl orange. The method checked the Kjeldahl analyses to within 0.18%. Admixts. of urea, guanidine, or biuret do not interfere when a 15-min. heating period is used. Equally good results were obtained in the presence of phenol-CH_2O resins; in this case the resin was extd. with hot H_2O for 3-4 min. and the soln. was used for the analysis. G. M. K.

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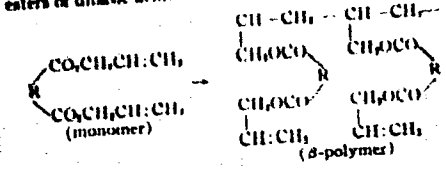
The chemistry and technology of synthetic high-molecular compounds. I. Polymerization of ethylene glycol dimethacrylate. A. A. Berlin and I. F. Bogdanov. *J. Gen. Chem.* (U.S.S.R.) 17, 1699-1705(1947)(in Russian).—(1) $(CH_2O_2CCMe:CH_2)_2$ (I) was synthesized by heating a mixt. of 750 g. $CH_2:CMeCO_2Me$ with 100 g. $(CH_2OH)_2$, 5 g. concd. H_2SO_4 and 50 g. hydroquinone 6 hrs. at 140-50° under a stream of dry N or CO_2; the reaction is considered completed after 100-120 ml. MeOH have boiled away. After neutralization with $NaHCO_3$ or $CaCO_3$ and distn. under 7.5 mm., the ester was obtained 99.5-99.8% pure in 40% yield. (2) The polymer obtained in either bulk or in soln. has d^{20} 1.2322 and does not soften up to 200-30°; depolymerization in vacuo at 210-30° under CO_2 yields 70% liquid products; vacuum distn. gives about 40% initial I, 40% residue, and 20% undetd. products. (3) Polymerization of I in the presence of Ba_2O_2 passes through an induction period, the length, τ, of which depends on the temp. and the amt. of catalyst; at 60°, with 1 and 0.5% Ba_2O_2, τ = 1-1.5 and 6-8 hrs., resp.; at 80°, τ = 15 min. and the reaction is completed in 1-1.5 hrs. The progress of the reaction was followed by the vol. contraction, complete polymerization corresponding to a contraction by 15.6%. The 1st-order rate consts. $k = (2.303/t) \log a/(a - x)$, with a and x expressed in terms of the corresponding indications of the dilatometer, are fairly const. in bulk polymerization and in 50% soln. in PhMe but rise significantly with time in 50% soln. in $MeCO_2Et$, thus, at 60 ± 0.2°, with 1% Ba_2O_2, in bulk, in 30 hrs., the degree of completion of the polymerization P = 55.5%, 10^4k = 154 → 200; in PhMe, 22 hrs., P = 60.0%, 10^4k = 190 → 416; in Me_2CO, 22 hrs., P = 80.0%, 10^4k = 233 → 1005. The relative slowness of the bulk polymerization as compared with the reaction in soln. is ascribed to mech. binding of the monomer by the insol. polymer. (4) In an attempt to detect intermediate formation of a sol. β-polymer in the liquid above the insol. polymer gel formed in bulk polymerization, samples of the liquid were treated at various stages with a 20-fold vol. of alc., yielding up to 1% of polymer insol. in alc. and in Me_2CO; the amt. of the ppt. did not change in the course of the reaction, and the characteristic consts. of the supernatant liquid remained practically unchanged (n_D^{20} 1.4553, η of a 10% soln. in PhMe 0.034 centipoise, η 1.07); hence, bulk polymerization of I does not proceed over an intermediate sol. β-polymer (prepolymer). This mechanism is proper only for polyfunctional compds. in which the double bonds are sepd. from the COO groups by CH_2 groups, with the result that resonance and polarizability of the double bonds are significantly reduced; thus, polymerization of allyl esters of dibasic acids can be represented by



further addn. of the monomer to the β-polymer results in

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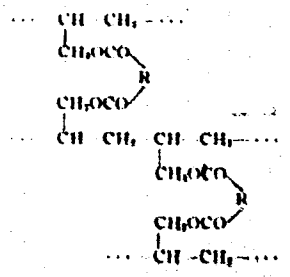

(b) I copolymerizes readily with $CH_2:CMeCO_2Me$ (II) at 60° in the presence of 1% Bz_2O_2. The polymer obtained with 0.5% I is practically insol. but swells to some extent in Me_2CO, C_6H_6, and $CHCl_3$; with over 0.5% I, the product is outright insol. and does not soften up to 200°. The induction period increases with the amt. of I, thus, with 0, 0.5, 1, 5, 10, and 50% I, τ = 1, 1.5, 2.8, 7.5, 9, and 13.3 hrs. The mechanism of the copolymerization is evidently basically different depending on the amt. of the polyfunctional I added to the monofunctional II; thus, with less than 0.1% I, the viscosity η of the liquid increases regularly and no insol. gel seps.; with 0.1–0.3% I, the mechanism of the copolymerization becomes similar to that of the polymerization of pure I, with the insol. polymer beginning to sep. instantaneously after the long induction period, and η of the supernatant liquid remaining practically const. throughout the reaction. (c) Copolymerization of $CH_2:CMeCO_2Me$, of $CH_2:CHCO_2Bu$, and of $CH_2:CMeCO_2Bu$ with not over 1% I at 60° yielded elastic polymers insol. in org. solvents. N. Thon

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1.47047, n_D^{20} 1.47610, d_4^{20} 0.9049 (*HCl salt* m. 175-7°; *picrate* m. 108°). I (185 g.), heated with 134 g. K phthalimide 3 hrs., yields 155 g. (72.3%) N-(3-*chloro-2-butenyl*)*phthalimide* (VI), b. 190-7°, m. 87° (from alc. after CS_2 treatment to remove traces of phthalimide). VI (45 g.), mixed gradually with 50 cc. concd. H_2SO_4 and treated with ice after 24 hrs., yields 30 g. (72.3%) N-3-*oxobutyl*)*phthalimide* (VII), m. 110° (from 50% alc.) (*semicarbazone* m. 200-2° (decompn.); *oxime* m. 178°). Attempted Beckmann rearrangement of VII oxime with concd. H_2SO_4 and 10% oleum yields phthalic acid and $(CH_3)_2(NH_2)_2$. VII (69 g.) with 70 g. EtSH in 350 cc. 90% AcOH, sat. at 0° with HCl gas, yields 62 g. (90.3%) VII *di-Et mercaptole*, m. 30-40° (from dil. alc.); this, oxidized in Ac_2O with $KMnO_4$, yields 47 g. (78.4%) N-(3,3-*bis*(*ethylsulfonyl*)*butyl*)*phthalimide* (VIII), m. 139-40°. VII, hydrolyzed with 20% HCl, yields 96.6% 4-*amino-2-butanone-HCl* (IX); the free amine is a nondistillable oil (*picrate* m. 125-30°; *chloroplatinate* decomp. 170°). Hydrolysis of VIII with HCl in a sealed tube yields 3,3-*bis*(*ethylsulfonyl*)*butylamine-HCl*, m. 122-4°; hydrolysis with boiling 48% HBr yields 23.5% of the corresponding *HBr salt*, m. 165°; the free amine is a cryst. material. Refluxing 72 g. Na benzamide with excess I yields 29 g. N-(3-*chloro-2-butenyl*)*benzamide*, b. 210°, m. 57°; 16 g. with 16 cc. concd. H_2SO_4 at 0° 7 hrs. yields 7 g. (50%) N-3-*oxobutyl*-*benzamide* (X), m. 78° (*semicarbazone* m. 180-1°). Hydrolysis of X with 20% HCl yields IX. III.HCl (230 g.) with 230 cc. 97% H_2SO_4 5 hrs. at room temp. and 5 hrs. at 50° yields 3-*acetyl-4-methyl-1,2,5,6-tetrahydropyridine-HCl* (*picrate* of the free base, m. 127°; *semicarbazone* of the HCl salt m. 176-82°). NaOH (160 g.), 1000 cc. H_2O, 350 cc. 30% aq. $MeNH_2$, and 500 cc. I with slight cooling yield after 16 hrs. 240 g. (57.7%) N,N-*bis*(3-*chloro-2-butenyl*)-*methylamine* (XI); XI is obtained in 65.2% yield by heating 500 g. I, 200 g. 33% aq. $MeNH_2$, and 160 g. 33% aq. NaOH at 100° 3.5 hrs. Pure XI b. 105-7°, $b_{10.5}$ 122.5°, n_D^{20} 1.49806, n_D^{20} 1.46945, n_D^{20} 1.49805, n_D^{20} 1.50543, d_4^{20} 1.0545 (*HCl salt* m. 125°; *picrate* m. 110-11°). XI.HCl (80.7 g.) added slowly to 81 cc. concd. H_2SO_4, after 30 hrs. at 20° and 15 hrs. at 50-5°, yields a small amt. of apparently 1-*methyl-1,2,5,6-tetrahydropyridine* and crude 1,4-*dimethyl-3-acetyl-1,2,5,6-tetrahydropyridine* (XII), purified through its *picrate*, m. 145-6°. Pure XII $b_{10.5}$ 94°, b_{10} 98-9°, b_{10} 101-2°, b_{10} 104-5°, $b_{10.5}$ 112°, n_D^{20} 1.496, d_4^{20} 25% NH_4OH, and 4.5 g. $AgNO_3$ in H_2O; hydrolysis with 15% HCl yielded 7.8 g. II, m. 135°. Similarly, 15 g. I yielded 9 g. *cis*-1,2-cyclopentanedipropionic acid (III), m. 135° (*diamide* m. 182°); and II yielded the corresponding *trans*-acid (IV), m. 165°. III (3 g.), heated from 260-360° with 3 g. Fe powder and 0.15 g. $Ba(OH)_2$, yielded as a distillate 1.65 g. (77.5%) *cis-bicyclo*[5.3.0]-4-*decanone* (V), b_{12} 110° (*semicarbazone* m. 185°); similarly, 2 g. IV yielded 0.75 g. (47%) of the *trans-isomer*, b_{12} 126° (*semicarbazone* m. 178°). V (4.9 g.) with MeMgI yielded 5.1 g. (94%) 4-*methyl-cis-bicyclo*[5.3.0]-4-*decanol*, b_{10} 108-10° (faint blue color); this, dehydrated at 180° with 3.75 g. $KHSO_4$, gave 3.9 g. (95%) 4-*methyl-cis-bicyclo*[5.3.0]-3-*decene* (VI), b_{10} 90-2°. VI (3.6 g.), heated 1 hr. at 220° in N with 2.7 g. S, gave 1.2 g. of a purplish oil (0.4 g. b_{10} 70-100°, 0.7 g. b_{10} 100-15°). The higher-boiling fraction contained 6-*methylazulene* (VII), which was isolated through its compd. with $C_6H_2(NO_2)_3$, m. 141°; this gave pure VII, m. 83° (purplish-blue crystals), upon chromatographic decompn. with hexane in an Al_2O_3 column. VII *picrate* m. 137°. These data do not check with those of Arnold (*C.A.* 38, 9066°), who is believed to have prepd. 5-methylazulene instead of VII.

R. W. Shortridge

0.9836. 1,1,4-*Trimethyl-3-acetyl-1,2,5,6-tetrahydropyridinium iodide* (from XII and MeI) m. 175-7°. V (50 g.) with 36.5 g. I after 5 weeks yields 1,1-*bis*(3-*chloro-2-butenyl*)*piperidinium chloride*, m. 208-10° (decompn.); this (37 g.) with 40 cc. concd. H_2SO_4 yields 4-*methyl-3-acetyl-1-azaspiro*[1.5]-3-*hendecenium chloride* (*picrate* m. 115-16°).

Robert W. Shortridge

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BERLIN, A.A.; BARANOVA, V.N.

Thermoreactive varnish. Patent U.S.S.R. 77,731, Dec.31, 1949.
(CA 47 no.19:10244 '53)

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BERLIN, A. A.

22511 Berlin, A. A. Nekotoryye Novyye Sinteticheskiye Polimery Vysokomolkolyar Soyedineniya, Vyk. 8, 1949, S 24-34 Bibliogr: S. 34

SO: Letopis' 30, 1949

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BERLIN, A. A.

A. A. Berlin and V. P. Parini

"Systematics of Highmolecular Compounds and Basic Types of Inorganic and Metal-Organic Polymers", Progress of Chemistry 18, 546-56, October 1949, Moscow

ABSTRACT AVAILABLE

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BERLIN, A. A.

USSR/Chemistry-Resins, Phenol Formaldehyde Jan 49
Rubber

"Developing a Method for Obtaining Rubber-Phenol-formaldehyde Resins," A. A. Berlin, S. K. Khomyakova, 8 pp

"Zhur Prikhad Khim" Vol XXII, No 1

Stable emulsions and nonpeeling rubber-resite films may be obtained by introducing positive NH_2 groups into the bakelite resin ("amphoterization" of resins). Urea-formaldehyde polycondensates form stable emulsions with latexes and revertex. The emulsions have high elasticity when 150-200% rubber-NK of the weight of the

[redacted]

49/49T32

USSR/Chemistry-Resins, Phenol Formaldehyde Jan 49
(Contd)

resinous part is introduced into composition of mixture. Casein is most suitable agent for "amphoterization" of phenolformaldehyde resins. Highest elasticity and mechanical strength are attained by combining bakelite resins with natural rubber. Synthetic rubbers must be used in much greater quantities (200% and more with respect to the weight of the resin) to attain the same elastic effect. Submitted 13 Jul 48.

[redacted]

49/49T32

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

"Chemical and Technological Research of Treated Wood Pulp and Plastic Wood Substances," (book), Moscow, 1950.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

Berlin, A.A.

BERLIN, A. A.

Issledovaniia v oblasti khimii i tekhnologii oblagorozhennoi drevesiny i drevesnykh plasticheskikh mass; pod red. L. P. Zherebova. Moskva, Goslesbumizdat, 1950. 176 p., illus.

Bibliography: p. 171-173.

Title tr.: Research in the field of chemistry and technology of refined wood pulp and wood plastic laminates.

TA419.B48

SO: Aeronutical Science and Aviation in the Soviet Union, Library of Congress, 1955

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

191T24

USSR/Chemistry - Plastics Jul 51

"Research in the Field of the Chemistry and Technology of Synthetic High-Molecular Compounds. II. Preparation and Polymerization of Acetomethacrylic Esters of Cellulose," A. A. Berlin, T. A. Makarova

"Zhur Obshch Khim" Vol XXI, No 7, pp 1267-1273

Cellulose methacrylates were prepd by (1) action of methacrylic acid chloride on cellulose, (2) interaction of alkali cellulose and methacrylic acid chloride, (3) action of methacrylic anhydride on formic acid-treated cellulose. Method

191T24

USSR/Chemistry - Plastics (Contd) Jul 51

(3) gave best results, yielding monosubstituted methacrylate. Acetylation of methacrylates yielded cellulose acetomethacrylates which were polymerized and copolymerized with methacrylic acid esters in presence of benzoyl peroxide into infusible products, insol in org solvents.

191T24

Abstract available -
D-50054

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

CA

11. Preparation and polymerization of acetomethacrylic esters of cellulose. A. A. Berlin and T. A. Makarova. J. Gen. Chem. U.S.S.R. 21, 1383-9(1951)(Engl. translation).—See C.A. 46, 1906d. H. R.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

177T29

USSR/Chemistry - Synthetic Resins and Elastomers — Mar 51

"Change of the Chemical and Mechanical Properties of Chlorinated Polyvinylchloride at Elevated Temperatures," A. A. Berlin, I. I. Denker

"Zhur Prik Khim" Vol XXIV, No 3, pp 308-313

As chlorinated polyvinylchloride (perchlorovinyl) resin is heated at 80-130°C it loses HCl, becoming less sol. This is due to formation first of sol unsatd product, then to 3-dimensional polymerization

[redacted]

177T29

USSR/Chemistry - Synthetic Resins and Elastomers (Contd) — Mar 51

of resulting macromols. This polymerization occurs easily in soln, needing higher temp in solid phase. After heating at 135° perchlorovinyl resin film becomes stronger but less expansible and flexible.

[redacted]

177T29

BERLIN, A. A.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

CA

31

Changes in the chemical and mechanical properties of chlorinated polyvinyl chloride at high temperatures. IV. A. A. Berlin and I. I. Denker. *J. Applied Chem. U.S.S.R.* 24, 339-43(1951)(Engl. translation).—See *C.A.* 46, 771*f*.
R. M. S.

1952

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

C4

31

Properties of coagula of phenol-formaldehyde resins precipitated by solutions of salts of multivalent metals from aqueous solutions. A. A. Berlin, D. G. Bernshtein, and M. V. Sobolevskii. *Zhur. Prikkl. Khim.* (J. Applied Chem. U.S.S.R.) 24, 1306-10(1951).--Water-sol. PhOH-HCHO resin (I), m. 75°, polymerization rate at 140° 15 sec., was pptd. by several electrolytes, yielding ppts. with the following properties: pptd. by H_2SO_4: m. 110°, polymerization rate 13.9 sec.; pptd. by H_3PO_4: m. 115°, polymerization rate 22 sec.; pptd. by KAl alum: does not soften, at 140° does not give stretchable threads; $Fe_2(SO_4)_3$ and tech. Al_2O_3 also gave nonsoftening and nondrawable products. It appears that the coagula are "resinolate" salts of the multivalent metals, which, owing to their tridimensional structure, lose their thermoplastic properties. The best solvent for the coagula is 70% AcOH. For extn. of I from impregnated paper it is suggested that the product be soaked 8-12 hrs. in 70% AcOH in Soxhlet thimble (without refluxing), then refluxed 6 hrs. conventionally.

G. M. Kosolapoff

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

USSR/Chemistry - Plastic Films Dec 51

"Effect of Certain Metallic Oxides on the Stability of Perchlorovinyl Resins at Elevated Temperatures," I. I. Denker, A. A. Berlin

"Zhur Prik Khim" Vol XXV, No 12, pp 1311-1316

Investigated effects of pigment admixts on stability and film-forming characteristics of perchlorovinyl. Showed (a) that basic oxides (ZnO) or Fe_2O_3 accelerate splitting off of HCl and formation of insol polymers, while powd Al has little effect on process, and (b) that formation of insol polymers under heat processing lowers elasticity of films and adhesion of coating to metal.

206T33

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.

USSR

Polymerization of dimethacrylic esters of glycols. A. A. Berlin, E. F. Rodionova, and A. K. Dabagova. *Sbornik Statei Obshchei Khim.* 2, 1554-9(1953); cf. following abstr.—The following esters were prepd. from $CH_2:CMeCOCl$ and the various glycols at 0° in the presence of 25% NaOH and a small amt. of Cu_2Cl_2 stabilizer; the yields of 55-60% dropped to 35-40% when NaOH was replaced by pyridine: $(CH_2:CMeCO_2CH_2)_2$ (I), b_2 83°, d_{20}^{20} 1.0483, n_D^{20} 1.4545; $(CH_2:CMeCO_2CH_2CH_2)_2O$, b_2 134°, d_{20}^{20} 1.0083, n_D^{20} 1.4593; $(CH_2:CMeCO_2CH_2CH_2OCH_2)_2$, b_2 158°, d_{20}^{20} 1.0922, n_D^{20} 1.4821. These were polymerized in the presence of 0.1-1.0% Bz_2O_2 in boiling MeOH, using both dilatometric and wt. methods for following the rate of polymerization. The rate of 3-dimensional polymerization was found to rise with increase of spacing between the unsatd. groups of the monomers, a fact contrary to that found among diallyl derivs. Polymerizations of I and of $(CH_2:CHCH_2O_2COCH_2CH_2)_2O$ proceed through formation of a branched, sol. polymer which has double bonds (β-polymer), which then forms the 3-dimensional product. The intermediate was isolated by treatment with Me_2CO and pptn. with MeOH. Good correspondence was found to exist between dctns. of polymer formation by dilatometric and gravimetric methods in this series. The kinetic curves are shown. G. M. K.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

USSR

Three dimensional polymerization of allyl ethers and mixed allyl ethers of methacrylic esters of glycols. A. A. Berlin, A. K. Dabagova, and R. P. Rodionova. *Sborn. Statei Obshchei Khim.* 2, 1560-5(1953).—Reaction of glycols with $CH_2:CMeCOCl$ or $CH_2:CHCH_2O_2CCl$ in the presence of pyridine at −10° gave 60-70% of the following derivs.: $CH_2:CHCH_2OCH_2CH_2O_2CCMe:CH_2$, b₁ 69-70°, d_{20}^{20} 0.9706, n_D^{20} 1.4400; $CH_2:CHCH_2OCH_2CH_2OCH_2CH_2O_2CCMe:CH_2$, b₁ 85-6°, d_{20}^{20} 1.0270, n_D^{20} 1.4538; $CH_2:CHCH_2O(CH_2CH_2O)_2CH_2CH_2O_2CCMe:CH_2$, b. undetd. owing to polymerization, d_{20}^{20} 1.0550, n_D^{20} 1.4587; $CH_2:CMeCO_2CH_2CH_2O_2CCH_2CH:CH_2$, b₁ 108°, d_{20}^{20} 1.0820, n_D^{20} 1.4500; $CH_2:CMeCO_2(CH_2)_2O(CH_2)_2CO_2CH_2CH:CH_2$, b₁ 119-20°, d_{20}^{20} 1.1020, n_D^{20} 1.4560; $CH_2:CMeCO_2(CH_2CH_2O)_2COCH_2CH:CH_2$, polymerizes on attempted distn., d_{20}^{20} 1.1070, n_D^{20} 1.4585; $(CH_2O_2CCH_2CH:CH_2)_2$, b₁ 127.5°, d_{20}^{20} 1.1210, n_D^{20} 1.4445; $O(CH_2CH_2O_2CCH_2CH:CH_2)_2$, b₁ 161°, d_{20}^{20} 1.1400, n_D^{20} 1.4515; $CH_2:CHCH_2OCH_2CH_2O_2CCH_2CH:CH_2$, b₁ 85.5°, d_{20}^{20} 1.0384, n_D^{20} 1.4415. The intermediate allyl ethers were prepd. from RCl or RBr and the corresponding Na deriv. of the glycols; $HOCH_2CH_2OCH_2CH:CH_2$ (I), b. 159-60°, d_{20}^{20} 0.9526, n_D^{20} 1.4355; $HO(CH_2CH_2O)_2CH_2CH:CH_2$, b₁ 98-101°, d_{20}^{20} 1.012, n_D^{20} 1.4440; $HO(CH_2CH_2O)_2CH_2CH:CH_2$, b₁ 115-18°, d_{20}^{20} 1.0699, n_D^{20} 1.4530. Passage of ethylene oxide into $CH_2:CHCH_2OH$ and 3% concd. H_2SO_4 at 50-60° gave 50-5% yield of I. Polymerization of these esters were run in pure state and in 25% MeOH solns. The results, given graphically, show the following. The methacrylic-allyl derivs. of the glycols and methacrylic-"carballylic" derivs. polymerize more rapidly than do "biscarballylic" or allyl "carballylic" derivs. Generally the increase of the distance between the functional groups of the above esters leads to increase rate of 3-dimensional polymerization; in "biscarballylic" esters this relationship is reversed. The principal factor affecting the rate of polymerization in MeOH is the steric factor which establishes the distance between the functional groups of the monomer. G. M. K.

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BERLIN, A.A., doktor tekhnicheskikh nauk, laureat Stalinskoy premii.

Foam rubber. Nauka i zhizn' 20 no.12:30-31 D '53. (MLRA 6:12)
(Foam rubber)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.; MALINSKIY, Yu.M., redaktor; POGUDKIN, P.V., tekhnicheskiy redaktor

[Principles of producing gas-filled plastics and elastomers] Osnovy proizvodstva gazonapolnennykh plastmass i elastomerov. Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry, 1954. 189 p. [Microfilm] (MLRA 8:3)
(Plastics) (Rubber, Synthetic)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

AID P - 1310

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 4/5

Author : Berlin, A. A. (Moscow)

Title : Polymers of oxygen-containing three-membered rings

Periodical : Usp. khim., 23, no. 8, 967-985, 1954

Abstract : Structure of alkylene oxides and their polymerization are covered. Preparation of oxides of aliphatic and aromatic hydrocarbons is treated in some detail. Some detailed data on the industrial uses of polymeric oxides and alkylenes are given. Two tables, 37 references (11 Russian: 1910-1952).

Institution : None

Submitted : No date

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

[illegible] and uses of polymers and copolymers of satd. and [illegible]

[illegible] glycidyl ethers and esters, are reviewed. Glycidyl allyl maleate b.p. 59-64°, n_D^{20} 1.4723, Br no. 69.4; glycidyl allyl [illegible]

[illegible] polyenes is pointed out. Some properties of epoxyhn res- [illegible] are compared with those of phenoplasts and of poly- [illegible]

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Metals

Inorganic polymers. A. A. Berlin and V. P. Parin. *Khim. Nauka i Prom.* 1, 41-51(1956).—Review with 88 references. H. M. Leicester

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A., doktor tekhnicheskikh nauk, professor.

Light plastic materials. Nauka i zhizn' 23 no.6:24-25 Je '56.
(MLRA 9:9)

(Plastics)

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A., doktor tekhnicheskikh nauk, professor; BARKAN, S.M., kandidat sel'skokhozyaystvennykh nauk.

Protective films. Nauka i zhizn' 23 no.7:54-55 Jl '56. (MLRA 9:9)
(Packaging)

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A. A.

USSR/Chemical Technology. Chemical Products and Their Application -- Wood chemistry products, Cellulose and its manufacture. Paper, I-23

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6277

Author: Yashunskaya, A. G., Ragovin, Z. A., Berlin, A. A.

Institution: None

Title: Investigation of the Conditions of Preparation of Carboxyethyl Cellulose

Original Publication: Zh. prikl. khimii, 1956, 29, No 1, 105-110

Abstract: Into a mixture of a solution of alkali and acrylonitrile (I) was added cellulose (C). After stirring for 40-45 minutes at 30-35° the reaction mixture was cooled to -5° and held at this temperature for 1-1.5 hour after which it was heated to 25°. After stirring for 4-6 hours, reckoning from the start of the treatment, a solution of carboxyethyl cellulose (CEC) was obtained. With a concentration of the NaOH solution of less than 2% the reaction of cyanoethylation proceeds very slowly. An increase in the concentration of NaOH

Card 1/2

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

USSR/Chemical Technology. Chemical Products and Their Application -- Wood chemistry products. Cellulose and its manufacture. Paper, I-23

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6277

Abstract: above 8% does not increase substantially the degree of esterification (DE). Factors which accelerate the hydrolysis [increase in temperature (45°), increase of the amount of alkali in the reaction mixture], lower the DE of C. On increase of the amount of NaOH solution from 10 to 50 ml, per 1 g C, the content of COOH groups in CEC decreases from 7.0 to 2.87%. Use of alkali C, produced by mercerization followed by pressing, comminution and pre-ripening, has made it possible to prepare CEC by direct action of I on alkali C, and to increase thereby considerably the utilization of I, in the primary reaction of esterification, from 10-22% to 46-63%. Maximum DE -- total γ = 95.1 (0.19% COOH groups, 6.22% nitrogen), was attained in 3 hours with expenditure of 1.5 mole I per unit C linkage. CEC prepared from sulfite wood C (degree of polymerization 300-400), dissolves in 7-10% solution of NaOH, with a 6-7% content of COOH groups (γ = 26-30). CEC prepared from reprecipitated C (viscose rayon), dissolves in 4-8% solution of NaOH with a 3-4% content of COOH groups (γ = 12-15%).

Card 2/2

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.; PENSKAYA, Ye.A.

Formation of active molecules in the cryolysis of water solutions of starch. Dokl. AN SSSR 110 no.4:585-588 O '56. (MIRA 10:1)

1. Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti. Predstavleno akademikom A.V. Topchiyevym.
(Starch) (Low temperature research)

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.

PHASE I BOOK EXPLOITATION

166

AUTHOR: See table of contents

TITLE: Advances in the Chemistry and Technology of Polymers (Uspekhi khimii i tekhnologii polimerov); Second Collection (Sbornik 2)

PUB. DATA: Goskhimizdat, Moscow, 1957, 296 pp., 3,000 copies

ORIG. AGENCY: Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva

EDITORS: Malinskiy, Yu.M.; Responsible Ed.: Rogovin, Z.A.; Tech. Ed.: Shpak, Ye.G.

PURPOSE: The book is intended for scientists and engineers in the industries producing plastics, natural and vulcanized rubbers, synthetic fibers, paints and varnishes; and also for teachers and students of these subjects in colleges.

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Advances in the Chemistry and Technology of Polymers (Cont.) 166

COVERAGE: The book is a collection of survey articles on the development of the chemistry of polymers. The articles cover new methods of modifying the properties of synthetic polymers and cotton fibers and the use of electron microscopes for studying polymer structure.

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Berlin, A.A. Chemical Transformations of Macromolecules 13

There are 87 references, 37 of which are Soviet, 40 English, 9 German, 1 French.

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APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8"

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Advances in the Chemistry and Technology of Polymers (Cont.)
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Academy of Sciences, USSR. There are 20 references, 4 of which are Soviet, 16 English.

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There are 2 Soviet references.

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Pechkovskaya, K.A.; Pupko, S.L.; Dogadkin, B.A. and Berestneva, Z.Ya. There are 14 references, 9 of which are Soviet, 4 English, 1 German.

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Advances in the Chemistry and Technology of Polymers (Cont.) 166
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Advances in the Chemistry and Technology of Polymers (Cont.) 166
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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.

BERLIN, A.A.

Chemical conversions of macromolecules. Usp. khim. i tekh. polim. no.2:13-52 '57. (MIRA 11:1)

(Macromolecular compounds)

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BERLIN, A., doktor tekhnicheskikh nauk.

Alginate-calcium films and their use for freezing meat. Mias. ind. SSSR no.2:44-47 '57. (MIRA 10:5)
(Meat, Frozen) (Alginic acid)

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6 MAY

Telomerization of propylene with carbon tetrachloride.

[illegible]

1.2529, n_D^{20} 1.4826, identified as *tetrachloro-3-methyln-zone* max. yield 25% from 2:1 C_3H_6–I. Fraction 6 b_1 121°, d_{10} 1.209, n_D^{20} 1.4796, analyzed as a substance contg 3 mol. C_3H_6 and a mol. CCl_4. I. Bencowitz

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7 Mechanical and chemical properties of [illegible] 7
[illegible] induced by ultrasonics [illegible]
[illegible] Chem. Technol. Inst. Meat and Dairy Ind., Moscow [illegible]
[illegible]

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method for the polymerization of styrene was worked out here. It consists of the polymerization of the thermal primary polymer of the styrene (with ≈ 30% polystyrene content) in water suspension. It is shown that this method reduces the polymerization time and increase the M_{mean} of the polymer by the 1,5-4 fold. / "Primary polymer" is the product of a partial thermal polymerization. Was obtained here by means of heating of the monomer at 80° up to the formation of 30 % of the polymer./ It is shown that the plastic substances on the basis of a suspension- and block suspension polymer are not inferior to the block polystyrene according to their properties, with respect to the dielectric characteristic factors (tg δ and ε), but even exceed the materials of emulsion polystyrene. There are 1 figure, 6 tables, and 6 references, 3 of which are Slavic.

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BERLIN, A.A.; GIL'MAN, I.M.

Investigating the process of suspension polymerization of styrol. Khim. prom. no.8:449-452 D '57. (MIRA 11:2)
(Styrene) (Polymerization)

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.

"The Mechanical Chemistry of Polymers," by Prof A. Berlin, Doctor of Chemical Sciences, Promyshlenno-Ekonomicheskaya Gazeta, No 18, 10 Feb 57

"Research conducted at the Laboratory of High-Molecular Compounds of the Moscow Technological Institute of the Meat and Dairy Industry has shown that, after solutions of polymers or solid swollen polymers have been frozen, partial deterioration of the polymers takes place by reason of the high internal pressure and of the stresses to which chain molecules are subjected. As a result, reactive substances are formed.

"Similar processes were found to occur after the action of ultrasound or in consequence of the effect exerted on the polymers by very intense agitation of solutions of these polymers. Analogous effects were observed after mechanical working of rubber, polyvinyl chloride, and other high-polymer substances on rollers.

"The formation of active molecules as a result of mechanical destruction of polymers by different means opens up new possibilities in the chemistry and technology of plastics, elastomers, protective coatings, and synthetic fibers.

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BERLIN A.

"When mixtures of polymers having different properties are subjected to mechanical destruction, the active products which form as a result of the breakdown of chain molecules react with each other and form hybrid molecules which exhibit new physical, chemical, and mechanical characteristics.

"It is known that polystyrene does not dissolve in water, but dissolves in aromatic hydrocarbons. When an emulsion of polystyrene in an aqueous solution of starch is frozen, a product is obtained which consists of blocks of polystyrene and of starch joined together. A block copolymer of this type forms colloidal solutions both in water and in aromatic hydrocarbons.

"One may give another example illustrating this phenomenon. When the brittle polystyrene is rolled together with rubber, a block copolymer is formed which has a high elasticity and at the same time is very strong and has a high dielectric constant.

"The possibilities of using this new principle of preparing polymer materials are practically unlimited.

"Investigation of the chemical transformations of polymers under the action of mechanical forces make it possible to throw new light on various technological processes which involve mechanical disintegration or the freezing of different technical polymers, food products, and animal and vegetable tissues.

SUM. 1305

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.

"On the basis of the experimental and theoretical data available in this field we may reach the conclusion that the time has come to form a new branch of polymer science, i.e., the mechanical chemistry of polymers.

"Development of this branch will make it possible to create new types of nonmetallic materials which exhibit a variety of valuable properties and to clarify to a greater extent the mechanism of various chemical and biological processes."

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BERLIN, A.A.,

"On Certain Trends in the Synthesis and Practical Application of Graft Copolymers," paper No. N22, submitted at the International High-Polymer Conference, Nottingham, 21-24 July 1958.

Laboratory, High Molecular Weight Compounds, Moscow, USSR.

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BERLIN, A.A.

KARGIN, V.A.

5(3) P4 PHASE I BOOK EXPLOITATION SOV/1589

Akademiya nauk SSSR.

Khimiya bol'shikh molekul; sbornik statey (Chemistry of Large Molecules; Collection of Articles) Moscow, Izd-vo AN SSSR, 1958. 299 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 30,000 copies printed.

Compiler: G.V. Sklovskiy; Resp. Ed.: A.V. Topchiyev, Academician; Ed. of Publishing House: V.A. Boyarskiy; Tech. Ed.: I.N. Guseva.

PURPOSE: This book is intended for a wide circle of readers including those who have had no training in chemistry. It can also serve as a manual for propagandists, teachers, and journalists.

Card 1/8

Chemistry of Large Molecules (Cont.) SOV/1589

COVERAGE: This collection of articles reflects the trend for the future development of the Soviet chemical industry as indicated by the May plenary session of the Central Committee of the Communist Party within the framework of the new Seven Year Plan. These articles were published in newspapers and journals. The authors, scientists and industry workers, developed the theme of accelerated development of the chemical industries, and sciences, with stress on the manufacture of synthetic fibers, plastics, and other materials. Some of the articles were abridged, revised, or enlarged. The articles were selected so as to give an adequate survey of the chemistry and technology of high-molecular-weight compounds and their use in industry, agriculture, and in the manufacture of consumers' goods. Mentioned are raw materials for the production of polymers. This book belongs to the popular-science series of the Academy of Sciences. Similar volumes are intended for future publication. No references are given.

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

BERLIN, A.A.

25-38-7-3/41

AUTHOR: Berlin, A.A., Professor, Doctor of Technical Sciences

TITLE: Chemistry of Large Molecules (Khimiya bol'shikh molekul)

PERIODICAL: Nauka i Zhizn', 1958, Nr 3, pp 6-11 (USSR)

ABSTRACT: A detailed description of natural polymers, polymerization, polycondensation, grafted co-polymerization, bloc co-polymerization and the mechanical chemistry of high-molecular compounds is given. The most important polymers encountered in nature are mentioned along with important research work done by A.M. Butlerov in promoting the development of the chemistry of synthetic materials. Butlerov worked on obtaining high-molecular substances from low-molecular compounds by means of polymerization. The reaction of polymerization is a good example of chain reactions, the theory of which was developed to a great extent by Nobel prize winner Academician N.N. Semenov. The practical application of polymerization has helped to elaborate a great number of different polymeric substances and materials. For example, by 1909 S.V. Lebedev had developed a method for producing synthetic rubber by

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polymerizing butadiene. In 1954, a polymerization method for propylene and many other hydrocarbon compounds was introduced, which formed polymers with extremely regular structures. Recently, a polymer of formaldehyde was developed. Soviet scientists were the first to synthesize viscous liquid substances (polyetheracrylate) which at increased temperatures can be transformed into glass-like, very durable, insoluble and infusible polymers. Polymeric substances of great importance for industrial purposes, such as phenolformaldehyde, carbamide and melanineformaldehyde resins, can be obtained by means of polycondensation. Recently, a new group of extremely efficient heat-resistant polyether compounds, derived from carbon acid and several phenols, have been synthesized. Today, polymeric substances, which, in the basic chain contain atoms of titanium, tin, boron, phosphorus and other elements combined with organic groups, are being produced. Due to their structure, these polymeric substances belong to the group of elementary organic polymers. In 1945-46, the USSR developed a new method of synthesis called "grafted co-polymerization", the main principle of which consists in polymer-

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izing a selected monomer under the influence of another polymer obtained from a different monomer. On the basis of this method, Soviet scientists succeeded in elaborating a great number of new substances combining the inherent property of polyvinylchloride oil resistant gasoline which has a ready solubility, increased adhesion properties and the atmospheric stability of acrylates. Besides "grafted co-polymerization", in the past few years the method of bloc co-polymerization gained in importance. It mainly consists in obtaining short polymeric blocs with reactive terminal groups, a fact, which ensures the consequent connection of these blocs into long chain molecules. A new field of science - mechanical chemistry-, which is just being developed, opens up great possibilities for synthesizing polymeric materials. Soviet scientists were the first to prove that the breaking of polymeric chains resulting in the formation of active radicals was also possible when freezing the polymers in water or in fluids made up of some organic solvents; the rupture of the long molecules is effected by considerable pressure resulting from the freezing of water.

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Card 3/3 1. Polymers-Analysis

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"APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000204930005-8

5(3)

AUTHORS: Berlin, A. A., Parini, V. P. SOV/153-58-4-20/22

TITLE: On Some Characteristics of Polynuclear Aromatic Compounds and on the Synthesis of Polymers Resistant to Heat (O nekotorykh osobennostyakh mnogoyadernykh aromaticheskikh soyedineniy i sinteze termostoykikh polimerov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 122 - 127 (USSR)

ABSTRACT: The demands made on polymer substances, first of all with respect to their high heat resistance, have been increasing during the last years due to the rapid development of airplane construction and rocket technology. The heat resistance of polymers depends on the chemical bonds strength in the main chains and the side groups of the macromolecules. The lower the free energy of the bonds, the higher is the temperature limit of the existence of a chemical compound. The compounds mentioned in the title have a high resistance to heat. This is caused by the characteristics of the chemical

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binding of such substances. In plane systems of conjugated bonds (benzene, naphthalene, and other molecules) the potential energy of the π-electrons is extremely low. The binding formed by σ-electrons in the aromatic compounds is covalent; it is similar to the metallic one. The chemical bond in these compounds should, according to its character, be termed as metallic -covalent. The resistance to heat of the aromatic nuclei is connected with the advantageousness of such a bond with respect to energy (due to the low potential energy of the π-electron). With the increase of the system of conjugated bonds the energy of the π-electrons decreases still further. Thus, the resistance to heat of the molecule should increase with the increasing number of conjugated benzene nuclei forming the molecule. The accumulation of the benzene nuclei can take place in the following ways: Formation of: a)Linear polyphenyls, b) Polyaromatic compounds with condensed nuclei in one line, c)Ramified polyaromatic compounds with a main chain of linearly bound or

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