GEORGIYEVSKIY, A.S., general-leytenant meditsinskoy sluzhby, prof.; AR'YEV, T.Ya., polkovnik meditsinskoy sluzhby, prof.; SHEYNIS, V.N., polkovnik med.sluzhby, doktor med.nauk

Organizational and clinical principles for medical aid and treatment of burns under the condition of modern war. Voen.-med.zhur. no.10:21-26 O '61. (MIRA 15:5)
(BURNS AND SCALDS) (MEDICINE, MILITARY)

AR'YEV, T.Ya., prof.(Leningrad); BABCHIN, I.S., prof.(Leningrad); VAYNSHTEYN, V.G., prof. (Leningrad); GORODETSKIY, Ye.M., kand. med. nauk (Moskva); GRATSIANSKIY, V.P., prof. (Leningrad); KORNEV, P.G., prof.(Leningrad); KAPLAN, A.V.,prof. (Moskva); LEVIT, V.S., zasl. deyatel' nauki, prof.[deceased]; PSHENICHNIKOV, V.I., prof.(Moskva); RUFANOV, I.G., prof. (Moskva); SITENKO, V.M., prof.(Leningrad); SMIRNOV, Ye.V., prof. (Leningrad); FRIDLAND, M.O., zasl. deyatel' nauki, prof.(Moskva); SHEYNIS, V.N., doktor med. nauk,(Leningrad); SHLAPOBERSKIY, V.Ya., prof.(Moskva); VISHNEVSKIY, A.A., prof., red.; GOL'DGAMMER, K.K., red.; BEL'CHIKOVA, Yu.S., tekhn. red.

[Specialized surgery] Chastnaia khirurgiia; rukovodstvo dlia vrachei v trekh tomakh. Pod red. A.A.Vishnevskogo i V.S.Levita. Moskva, Medgiz. Vol.3.[The extremities] Konechnosti. 1963. 670 p. (MIRA 16:5)

1. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for Kornev, Rufanov).

(EXTREMITIES (ANATOMY))--SURGERY)

SHEYNIS, V.N., polkovnik meditsinskoy sluzhby, doktor med. nauk

Problem of general chilling (freezing) of humans; review of the literature. Voen. - med. zhur. no.1:29-34 '63.
(MIRA 17:8)

SHEYNIS, V.N., prof., polkovnik meditsinskoy sluzhby

Expert evaluation of burn sequelae. Voen.-med. zhur. no.3:46-47 '65. (MIRA 18:11)

SHEYNIS, Ye.S., assistent; VASIL'YEV, S.S., prof.

Dielectric properties of dry and moist leather in the frequency range from 50 to 6,000 kc. Izv.vys.ucheb.zav.; tekh.leg.prom. no.5:67-73 '58. (MIRA 12:2)

1. Moskovskiy tekhnologicheskiy institut legkoy promyshlennosti.
(Leather--Electric properties)

SHEYNIS, Ye. S., Candidate Tech Sci (diss) -- "The effect of high-frequency currents on the mechanical properties of leather". Moscow, 1959. 18 pp (Min Higher Educ USSR, Moscow Tech Inst of Light Industry), 130 copies (KL, No 25, 1959, 136)

SHEYNIS, Ye.S., kand.tekhn.nauk, dotsent; VASIL'YEV, S.S., doktor khimicheskikh nauk, prof.

Effect of high-frequency currents on the reactions of strained leather. Nauch.trudy MTILP no.18:52-60 '60. (MIRA 15:2)

1. Kafedra fiziki Moskovskogo tekhnologicheskogo instituta legkoy promyshlennosti.
(Leather--Testing) (Strains and stresses)

VASIL'YEV, S.S., doktor khim. nauk, prof.; SHEYNIS, Ye.S., kand. tekhn.
nauk, dotsent

Kinetics the elastic reactions of leather. Nauch. trudy MTILP
no.24:112 '62. (MIRA 16:7)

1. Kafedra fiziki Moskovskogo tekhnologicheskogo instituta
legkoy promyshlennosti.
(Leather—Testing)

SHEYNIS, Ye.S., kand. tekhn. nauk, dotsent; VASIL'YEV, S.S. prof., doktor khim. nauk

Conductivity of moist leather at high frequencies. Nauch. trudy MTILP no.24:118-120 '62. (MIRA 16:7)

1. Kafedra fiziki Moskovskogo tekhnologicheskogo instituta legkoy promyshlennosti.
(Leather—Electric properties)

ZOLOTAREV, S.V., student; OVSEPYAN, M.A.; ONDASYNOVA, A.I.; RYABOY, M.I.;
SHEYNIS, Ye.S., rukovoditel' raboty kand. tekhn. nauk, dotsent

Elements of physics in leather and shoe manufacture. Nauch. trudy
MTILP no.28:85-95 '63. (MIRA 17:11)

1 Kafedra fiziki Moskovskogo tekhnologicheskogo instituta legkoy
promyshlennosti.

[illegible]

Investigating some irradiating units for [illegible] drying by means of high frequency currents. Nauch. trudy MTILP no.26:[illegible] '63.

(MIRA 17:[illegible])

1. Kafedra [illegible] Moskovskogo tekhnologicheskogo instituta legkoy promyshlennosti.

IVANOV, Konstantin Petrovich; SHEYNIS, Zinoviy Savel'yevich;
DINERSHTEYN, I., red.; DANILINA, A., tekhn.red.

[The state of Israel, its economic conditions and foreign policy] Gosudarstvo Izrail', ego polozhenie i politika. Izd.2., dop. Moskva, Gos.izd-vo polit.lit-ry, 1959. 187 p. (MIRA 12:11)

(Israel--Economic conditions) (Israel--Foreign relations)

SHEYNIS, Zinoviy Savel'yevich; PETROV, P., red.; KLIMOVA, T., tekhn. red.

[Wotan's shadow is here again] Snova ten' Votana. Moskva, Gos. izd-vo polit. lit-ry, 1961. 68 p. (MIRA 15:2)
(Germany, West--Description and travel)

SHEYNKAR, I.M., inzh.

Phasing of grid controlled thyratron rectifiers. Vest. sviazi 21 no.12:3-6 D '61. (MIRA 14:12)

(Electric current rectifiers)

SHEYNKER, A. P. EL'PINER, I. Ye.

"Production of Endotoxins (Of the Culture of bacillus pertussis) by Ultrasonic Waves,"

Byull. eksp. biol. i med., 1947, 7, 51

M-28, 14 Dec 1954

SHEYNKER, A. P.

Physical Chemistry

Dissertation: "Investigation of the Kinetics of th Polymerization of Isoprene in Aqueous Solutions of Emulsifiers and Emulsions." Cand Chem Sci, Sci Res Physicochemical Inst imeni L. Ya. Korpov, Moscow, 1953. (Referativnyy Zhurnal --Khimiya, Moscow, No 3 Feb 54)

SO: SUM 213, 20 Sept 1954

SHEYNKER, A.P.

USSR/ Physics - Physical chemistry

Card 1/1 Pub. 43 - 57/62

Authors : Sheynker, A. P., and Medvedev, S. S.

Title : Polymerization temperature and its effect on the formation of butadiene styrene copolymers

Periodical : Izv. AN SSSR. Ser. fiz. 18/6, 736-737, Nov-Dec 1954

Abstract : The composition of butadiene-styrene copolymers obtained at various temperatures (-15 to + 38°C) in emulsions was investigated by means of absorption spectra (2 - 15 μ). The content of various configurations of butadiene links in polymer chains was also investigated and established. Glycerin was used as the antifreeze when the polymerization was carried out at below-zero temperatures. Polymer solutions in carbon bisulfide were utilized for photographing the spectra. Results are described.

Institution : The L. Ya. Karpov Phys. Chem. Inst.

Submitted : ....

Sheynker/ A.P.

USSR/Chemistry Physical Chemistry

Card : 1/1

Authors : Sheynker, A. P., and Medvedev, S. S., Member Corresp. of Acad. of Sc. USSR

Title : Investigation of the kinetics of polymerization of isoprene in aqueous emulsifier solutions and emulsions

Periodical : Dokl. AN SSSR, 97, Ed. 1, 111 - 114, July 1954

Abstract : The kinetics of isoprene polymerization was investigated in water, in N-cetylpyridine bromide emulsifier solutions and in emulsions under the effect of a water-soluble initiator (H_2O_2) for the purpose of determining the mechanism of emulsion polymerization. The kinetic measurements in emulsifier solutions not saturated with isoprene and in emulsions were carried out by means of the dilatometric method. The results are presented in table and graphs. Four references: 2 USSR and 2 USA.

Institution : The L. Ya. Karpov Scientific-Research Physico-Chemical Institute

Submitted : March 20, 1954

SHEYNKER, A.P.

4002

2 mug

✓936. Investigation of polymerisation kinetics of isoprene in aqueous solutions of the emulsifier and in emulsions. A. P. SHEINKER and S. S. MEDVEDEV. *Zhur. fis. Khim.*, 1955, 29, 350–52; *Gummi u. Asbest.*, 1955, 8, 703. It was desired to study the mechanism of emulsion polymerisation stage by stage, and isoprene was selected for study with a cation-active emulsifier and a water-soluble initiator. Polymerisation does not begin until the introduction of the emulsifier. It appears that the entire sequence of polymerisation takes place within the emulsifier or on the adsorption layer on polymeric particles and emulsion droplets, the part played by the latter process being small. Polymerisation within the polymeric particles practically does not occur on account of the very weak concentration of the initiator in the polymeric particles. The constant amount of emulsifier means constancy of the total surface of the polymeric particles and a steady rate of polymerisation. The formulae developed from these concepts agree well with test results.

352D22,123

CH

Sci Res
Physico Chem
Inst. im L Ya Karpov

(1)

SHEYNKER, A. P.

Effect of polymerization temperature on the structure of copolymers of butadiene with styrene. A. P. Sheinker and 62
S. S. Medvedev. *Doklady Akad. Nauk S.S.S.R.* 102,
1143-5(1955).—Infrared examn. was made of copolymers
of butadiene with PhCH:CH₂ at −15° to 38°. Kine-
tic data, shown graphically, for polymerizations which
were run in aq. phase with Na sulfonate emulsifier, show that
rise in temp. gave higher polymer yields, while introduction
of glycerol into the mixt. (for antifreeze purposes) reduced
the yield of polymer somewhat. The energy of activation
was estd. at 9 cal./mole. The no. of styrene units was estd.
from intensity of differential infrared absorption at 700
cm.⁻¹ (Ph ring), while the butadiene content was estd.
from 967 and 908 bands. (For calcn. techniques, cf. Hart
and Meyer, *C.A.* 43, 7822*f*; M., *C.A.* 43, 8725*e*; Cross,
et al., *C.A.* 46, 3405*i*). Polymers prepd. in the absence
of glycerol showed the content of trans structure increased
by 17% when the temp. was raised from 0° to 38°. No
polymer compn. change was observed. Unsatn. of the
polymer prepd. in the presence of glycerol was decidedly
smaller than that found in specimens prepd. in the presence
of glycerol, if calcd. on the wt. of the polymer; calcd. on the
basis of butadiene links, the unsatn. was the same in both
cases. Products formed at −15° in the presence of gly-
cerol had the same compn. as those formed at 20°, in respect
to cis-trans components. G. M. Kosolapoff

Sci Res Physico-Chem
Inst. im L. Ya. Karpov

(1)

SHEYNKER, A. P.; Medvedev, S. S.

"Study of the Kinetics of Polymerization in Colloid Solutions of Soaps and Emulsions" (Issledovaniye kinetiki polimerizatsii v kolloidnykh rastvorakh myl i emul'siyakh) from the book Trudy of the Third All-Union Conference on Colloid Chemistry, pp. 450-457, Iz. AN SSSR, Moscow, 1956

(Report given at above Conference, Minsk; 21-4 Dec 53)

F-3

USSR/Microbiology. Hemoglobinophillic Bacteria

Abs Jour : Ref Zhur - Biol., No 14, 1958, No 62387

Author : Sheynker A.P., El'piner I.Ye.
Inst : AS USSR
Title : Immunizing Properties of Pathogenic Bacteria Subjected to the Action of Ultra-sound Waves (Pertussis Bacillus).

Orig Pub : Dokl. AN SSSR, 1956, 111, No 2, 470-472

Abstract : It was shown that through the action of ultrasound waves on pertussis bacilli, not only the toxins of the decomposed culture, which had passed into a physiological solution, but even the cultureitself, possessed antigenic properties. The pertussis bacilli thereby lose their virulence, ertaining their immunogenic properties. The authors employed the culture, preserving it in a dry state. 15-20 ml of culture suspension (according to the enteric standard)

Card : 1/2

USSR/Microbiology. General Microbiology F

Abst Jour : Ref Zhur-Biol., No 13, 1958, 57457

Author : Sheynker A. P., El'piner I. E.
Inst : Not given
Title : Variability of Bacillus Pertusus Caused by Ultrasonic Waves

Orig Pub :: Biofizika, 1957, 2, No 3, 351-357

Abstract : A suspension of Bacilli pertusis in a physiological solution was sounded at frequency vibrations of 700 kilohertz and an intensity of 8 watt/cm^2. When seeded on a Borde-Zhangu medium immediately after the sounding, the bacteria developed in a normal manner. Morphological, toxic, and immunogenic changes in the properties of the pertusis bacillus were observed as a result of decomposition products when the

Card 1/2

Inst. Biological-Physics AS USSR Moscow

SOV/81-59-10-37461

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 10, p 577 (USSR)

AUTHORS: Medvedev, S.S., Khomikovskiy, P.M., Sheynker, A.P., Zabolotskaya, Ye.V., Berezhnoy, G.D.

TITLE: The Regularities of Emulsion Polymerization 1

PERIODICAL: V sb.: Probl. fiz. khimii. Nr 1, Moscow, Goskhimizdat, 1958, pp 5-17 ✓

ABSTRACT: A review. There are 13 references.

Card 1/1

5.3831

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~~5(4)~~

SOV/76-33-11-47/47

AUTHORS: Abkin, A. D., Sheynker, A. P., Mezhirova, L. P.

TITLE: On the "Carbanion" Mechanism of Polymerization Under the Effect of Gamma Rays 19

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 11, p 2636 (USSR)

ABSTRACT: Data from publications (Ref 1) on the polymerization of isobutylene, and data of the joint polymerization of isobutylene with vinylidene chloride and of the styrene with methyl methacrylate, obtained by the authors (Ref 2) show that at low temperatures and influenced by nuclear radiation, the polymerization occurs according to the carbonium mechanism. Up to present there is no information in publications on the course of a "carbanion" mechanism at the polymerization under the influence of nuclear radiation. It has been established that the polymerization may proceed according to both mechanisms (carbonium or "carbanion" mechanism) and that this is not determined by the chemical structure of the monomers, but by the nature of the medium. Data on the polymerization of acrylic acid nitrile and styrene at -78°C (Table) under the influence

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On the "Carbanion" Mechanism of the Polymerization Under the Effect of Gamma Rays

of gamma rays, show that the polymerization of the acrylic acid nitrile in solving agents with electron donor substituents (triethyl amine, dimethyl formamide) occurs and that none occurs in ethyl chloride (which is usually used for carbonium polymerization) containing electrophilic groups. Contrary, styrene polymerizes only in ethyl chloride. These data show that acrylic acid nitrile, which has molecules containing electronegative groups, polymerizes, under the given conditions, not according to the radical mechanism, but according to the "carbanion" mechanism. It is mentioned that more detailed results of the investigations carried out will be published later and that the authors thank Academician S. S. Medvedev. There are 1 table and 3 references, 2 of which are Soviet.

4

Card 2/2

5(4) SOV/20-124-3-39/67

AUTHORS: Sheynker, A. P., Yakovleva, M. K., Kristal'nyy, E. V., Abkin, A. D.

TITLE: On the Mechanism of the Low-temperature Polymerization of Monomers Under the Action of a Gamma-radiation (O mekhanizme nizkotemperaturnoy polimerizatsii monomerov pod deystviyem gamma-izlucheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 632-634 (USSR)

ABSTRACT: The present paper deals with the results obtained by investigating the mechanism of the low-temperature polymerization of various vinyl compounds under the action of a γ-radiation. The authors investigated this mechanism by employing the method of joint polymerization, according to which it is possible to obtain the necessary information concerning the nature of active particles (radicals, ions) participating in the active process from the composition of the Ko-polymer and from the kinetic data. The authors investigated the common polymerization of isobutyls with vinylidene chloride (in the "mass") in the temperature interval of -78 to 0°,

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On the Mechanism of the Low-temperature Polymerization of Monomers Under the Action of a Gamma-radiation

and of methyl-metacrylate with styrene in ethylchloride as solvent at -78 to +25°. Polymerization was carried out in ampoules on a Co^{60}-source of 20,000 g-equivalents at an intensity of 230-250 r/sec. The degree of polymerization was not more than 10%. A diagram supplies data concerning the dependence of the copolymers on the composition of the original mixture for the system isobutylene-vinylidene chloride, which were determined in the course of polymerization at different temperature conditions. From these data the constants of the common polymerization α (for isobutylene) and β (for vinylidene chloride) were then determined according to the simplified equation for the integral composition. The following holds:

Polymerization temperature in °C	α	β
-78	25	0
-40	1.27	0.21
0	0.03	1.3

The composition of the common polymers formed depend to a

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On the Mechanism of the Low-temperature Polymerization of Monomers Under the Action of a Gamma-radiation

considerable extent on temperature. Details are given. The data discussed in the present paper permit the following conclusions to be drawn: The joint polymerization of isobutylene with vinylidene chloride under the influence of a γ-radiation at low temperatures occurs according to the carbonium (karboniyeviy) mechanism or a similar mechanism. The authors further investigated the polymerization of styrene in an equimolecular mixture of styrene and methyl metacrylate in ethyl chloride as solvent. With decreasing temperature, the methyl metacrylate component in the copolymer decreases, which indicates an increase of the share of ion reactions in this process. The authors thank Academician S. S. Medvedev for discussing the results obtained. There are 2 figures, 2 tables, and 8 references, 4 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-Chemical Scientific Research Institute imeni L. Ya. Karpov)

Card 3/4

[illegible]

"On the carbonium and carbonion mechanisms of gamma-ray induced polymerization."

report presented at the International Polymer Symposium, (IUPAC), Moscow, USSR, 14-18 June 1960.

PHASE I BOOK EXPLOITATION SOV/4983

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii, SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya II. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18; Papers and Summaries) Section II. [Moscow, Izd-vo AN SSSR, 1960] 559 p. 5,500 copies printed.

Sponsoring Agency: The International Union of Pure and Applied Chemistry, Commission on Macromolecular Chemistry

Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high-molecular compounds.

COVERAGE: This is Section II of a multivolume work containing papers on macromolecular chemistry. The papers in this volume treat mainly the kinetics of various polymerization reactions initiated by different catalysts or induced by radiation. Among the research techniques discussed are electron paramagnetic resonance spectroscopy and light-scattering interpolation. There are summaries in English, French and Russian. No personalities are mentioned. References follow each article.

Mihail, R., and J. Herscovici (Rumania). On the Mechanism of the Formation Reaction of Stereoregular Polymers 302

Simon, A., and G. Ghymes (Hungary). On the Kinetics of a Reaction on Zeigler Catalysts 310

Wichterle, O., M. Marek, and I. Trekoval (Czechoslovakia). Kinetics of the Polymerization of Isobutylene on a Heterogeneous Catalyst 322

Boček, V. (Czechoslovakia). Heterogeneous Catalysts for the Polymerization of Alpha Olefins 330

Veselý, K., I. Ambrož, R. Vilim, and O. Hamřik (Czechoslovakia). The Effect of Donor Type Impurities on the Polymerization of Propylene. Catalyzed by the System Titanium Trichloride-Triethyl-aluminum 337

Dolgoplosk, B.A. (USSR). Study of the Factors Leading to the Degradation of Chain Structure During the Ionic Polymerization of Dienes 346

Yerusalimskiy, B.L., Wang Fo-sung, and A.P. Kavunenko (USSR). Study of the Interaction of Organomagnesium Compounds With Salts of Heavy Metals and the Use of Organomagnesium Compounds and Their Complexes to Stimulate Polymerization 355

Santo, I., and K. Gal (Hungary). The Effect of Organic Inner Complexes of Some Metals of Variable Valence on the Kinetics of the Polymerization of Vinyl Compounds 366

Bresler, S.Ye., M.I. Mosevitskiy, I. Ya. Poddubnyy, and Shih Kuang-i (USSR). Study of Some Details of the Mechanism of Polymerization Under the Action of Complex Catalysts 372

Tsvetkov, V.N., S.Ya. Magarik, N.N. Boytsova, and M.G. Okuneva (USSR). Stereospecificity and the Optical Properties of Polymers 378

Birshteyn, T.M., Yu. Ya. Gotlib, and O.B. Ptitsyn (USSR). The Microtacticity of Polymers and Methods of Study 388

Abkin, A.D., A.P. Sheynker, M.K. Yakovleva, and L.P. Mezhirova (USSR). On Carbonium and Carbanion Polymerization Mechanisms Under the Effects of Gamma Radiation 410

Kargin, V. A., and V.A. Kabanov (USSR). Polymerization Processes in Insoluble Molecular Dispersions 453

Machaček, Z., Y. Mejzlík, and Y. Pác (Czechoslovakia). Kinetics of the Polymerization of Formaldehyde 255

Vesely, K. (Czechoslovakia). On the Mechanism of Ionic Polymerization 262

Klímal, Z., and A. Kazda (Czechoslovakia). On the Role of Nonpolar Compounds in the Cationic Polymerization of Isobutylene 272

31

45

33125
S/638/61/001/000/056/056
B125/B104

15.8620

AUTHORS: Sheynker, A. P., Abkin, A. D.

TITLE: Ion mechanism of polymerization under the action of nuclear radiations

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 395-400

TEXT: The copolymerization of the following pairs of monomers was examined: isobutylene - vinylidene chloride (in the bulk) between -78 and 0°C; styrene - methyl methacrylate between -78° and 25°C; and isobutylene - styrene at -78°C (with ethyl chloride as solvent); acrylonitrile - styrene at -78°C (as solution in dimethyl formamide). Specially designed dilatometers and a Co^{60} source were used for the experiments. The copolymerization constants r_1 (for isobutylene), and r_2 (for vinylidene chloride) at -70, -40, and 0°C are 25, 1.27, 0.03, and 0, 0.21, 1.3, respectively. The compositions of the resulting copolymers are largely dependent on the polymerization temperature, and their concentration rises

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Ion mechanism of polymerization ... S/638/61/001/000/056/056
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significantly on cooling from -40 to -78°C. Therefore, low- and high-temperature polymerization under the action of radiation probably follow the ion and the radical mechanism, respectively. On the strength of these and other facts, gamma irradiation permits low-temperature copolymerization of isobutylene with vinylidene chloride according to the carbonium mechanism. The radiation polymerization of styrene and methyl methacrylate at 25°C follows the radical process. In the gamma polymerization of an equimolecular mixture of styrene and methyl methacrylate in ethyl chloride, the relative amount of the methyl methacrylate component in the copolymer drops rapidly with decreasing polymerization temperature. The resulting copolymers contain a component with a high concentration of styrene. Ion chains are formed in the low-temperature polymerization of styrene and methyl methacrylate according to the carbonium mechanism. The polymerization rate is reduced sharply by the addition of small amounts of isobutylene to styrene. Low-temperature radiation polymerization may also take place according to the ion mechanism. Not only the chemical structure of the monomer to be polymerized, but also the nature of the surrounding medium influences the polymerization mechanism. The mechanism of ion chain formation and the nature of the resulting ion pairs will later be studied. M. K. Yakovleva and L. P. Mezhirova assisted in the investiga-
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33125

Ion mechanism of polymerization ... S/638/61/001/000/056/056
B125/B104

tion. Academician S. S. Medvedev is thanked for interest. There are 5 figures, 2 tables, and 14 references: 7 Soviet and 7 non-Soviet. The four most recent references to English-language publications read as follows: Davison W. H. G., Pinner S. H., Worrall R., Chem. a Ind. 38, 1274, 1957; Worrall R., Charlesby A., Journ., Appl. Rad. a Isot. 4. 84, 1958; Worrall R., Pinner S. H., J. Pol. Sci., 34 N 127, 229, 1959. Burlant W. J., Green D. H., J. Pol. Sci., 31, 122, 227, 1958.

ASSOCIATION: N.-i-fiziko-khimicheskiy institut im. L. Ya. Karpova (Scientific Physicochemical Research Institute imeni L. Ya. Karpov)

X

Card 3/3

88731

S/190/61/003/001/015/020
B119/B216

11.2210

AUTHORS: Mezhirova, L. P., Sheynker, A. P., Abkin, A. D.

TITLE: The carbanionic mechanism of polymerization under the action of gamma rays

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 1, 1961, 99-104

TEXT: The present work studies the polymerization of acrylonitrile and its copolymerization with styrene under the action of γ-radiation at low temperatures for the purpose of explaining the reaction mechanism. Co^{60} was used as radiative source. The experimental temperatures ranged from -50 to -112°C. Polymerization was performed in the solvents dimethyl formamide, triethyl amine, isopropyl amine, acetone, toluene, acetonitrile, propionitrile, ethyl chloride, heptane, ethyl acetate. The reaction rate was measured dilatometrically. (The volume change of the reaction mixture during polymerization was measured by the change of electric resistance of a platinum wire and a mercury thread inside the dilatometer capillary). The acrylonitrile polymers were separated from their solutions by means of

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The carbanionic mechanism of...

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methyl alcohol and the styrene copolymers by a heptane - ether mixture. The copolymers were microanalyzed for C, H and N. In some cases the results were checked by infrared spectroscopy. At -78°C, and a dose rate of 128 rad/sec, the polymerization rate of acrylonitrile (initial concentration 3.5 mol/l) was 1.57 mol/l·sec·10^6 in isopropyl amine, 6.7 mol/l·sec.10^6 in triethyl amine, 9.7 mol/l·sec·10^6 in dimethyl formamide and 2.1 mol/l·sec·10^6 in the "bulk". The copolymerization constants were $r_1 = 33$ (acrylonitrile), $r_2 = 0.005$ (styrene). Results: Acrylonitrile polymerization occurs only in the solvents dimethyl formamide, triethyl amine and isopropyl amine, but not in solvents with electron acceptor properties. The composition of the copolymers obtained at -78°C by the above method and that of the analogous copolymers prepared by a radical reaction exhibit significant differences. The polymerization rate of acrylonitrile increases proportionately with the dose rate. A reduction of the reaction temperature from -50 to -112°C produces a great increase of reaction rate and molecular weight. The findings indicate a carbanionic reaction mechanism. The authors thank Ya. A. Tsarfin and K. G. Nogteva, both at Vladimirskiy nauchno-

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The carbanionic mechanism of... S/190/61/003/001/015/020
B119/B216

issledovatel'skiy institut sinteticheskikh smol (Vladimir Scientific Research Institute of Synthetic Resins) for carrying out the elementary analyses. There are 4 figures, 2 tables, and 8 references: 5 Soviet-bloc, and 3 non-Soviet-bloc.

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

SUBMITTED: June 9, 1960

Card 3/3

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S/190/61/003/005/007/014
B101/B218

AUTHORS: Sheynker, A. P., Abkin, A. D.

TITLE: Study of the mechanism of polymerization by radiation. I. Mechanism of carbonium polymerization of isobutylene and styrene under the influence of gamma radiation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 5, 1961, 716-722

TEXT: The authors studied the kinetics and mechanism of separate and joint polymerization of styrene and isobutylene under the action of gamma radiation. According to published data, these monomers polymerize at low temperature following the carbonium mechanism. The kinetics of the process was studied dilatometrically. Isobutylene and styrene (2.5 moles/l) dissolved in ethylchloride were filled into reaction ampoule 1 (equipped with spiral capillary 2; Fig. 1) until the level A was reached. This process was carried out in vacuo and at the same temperature at which polymerization was performed. Capillary 3 was filled with Hg. In order to prevent boiling of the reaction mixture, sphere 5 was filled with the same mixture so that a counterpressure existed. The platinum wire 4 with the contacts 7 was con-

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Study of ... S/190/61/003/005/007/014
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nected to a measuring bridge and, thus, the resistance was measured, which increased due to a decrease in volume during polymerization and simultaneous lowering to the Hg level in capillary 3. The mercury was collected in 6. Irradiation was carried out with Co^{60} at -78°C and a dosage of 106 rad/sec. Volume changes not caused by polymerization (i.e., due to heating during radiation adsorption) were corrected by a control dilatometer filled with ethylchloride, isopentene, and ethylbenzene. The composition of the copolymers was determined by Ya. A. Tsarfin and K. G. Nogteva (analiticheskaya laboratoriya Vladimirskogo NIISa; Analytical Laboratory of Vladimir NIIS) by elementary analysis. Fig. 5 shows the composition of copolymers consisting of isobutylene and styrene. During the initial stage of copolymerization, the yield of copolymer is a linear function of time. The same holds for separate polymerization of monomers: styrene $20.1\cdot10^{-6}$ mole/l·sec; isobutylene $14.1\cdot10^{-6}$ mole/l·sec. Fig. 7 shows the copolymerization rate ω for different molar fractions of isobutylene. Fig. 9 presents $\log\omega$ as a function of the logarithm of the radiation dose I (14-110 rad/sec). Also $\log\omega = f(\log c)$ (c = concentration is a linear function for both monomers. The authors calculated the reaction constants from the data on the composition of the copolymers: r_1 (isobutylene) = 3.5; r_2 (styrene) = 0.33. In radiation polymerization and at low temperature,

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isobutylene is more active than styrene. Polymerization proceeds according to the carbonium mechanism, similar to that in the presence of $SnCl_4$. The molecular weights of the copolymers were determined by N. V. Makletsova and found to be: ratio isobutylene : styrene in initial mixture:
1.0 : 0.0 0.9 : 0.1 0.5 : 0.5 0.1 : 0.9 0.0 : 1.0; molecular weight:
80,000 55,000 27,000 35,000 70,000.
As is shown in Fig. 10, copolymerization at 0°C takes an entirely different course. In this case, the radical mechanism comes in play, but this does not lead to polymerization of isobutylene. The polymers obtained at 0°C contained chlorine. There are 10 figures and 25 references: 8 Soviet-bloc and 17 non-Soviet-bloc. The 4 most important references to English-language publications read as follows: R. Worrell, S. H. Pinner, J. Polymer. Sci., 34, 229, 1959; W. H. J. Davison, S. H. Pinner, R. Worrell, Proc. Roy. Soc., A 252, 187, 1959; A. S. Hoffmann, J. Polymer Sci., 34; 241, 1959; F. S. Dainton, J. Polymer. Sci., 34, 241, 1959.

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

SUBMITTED: July 21, 1960

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23762

S/190/61/003/006/005/019
B110/B216

11.2210 also 2209

AUTHORS: Yakovleya, M. K., Sheynker, A. P., Abkin, A. D.

TITLE: Studies of the mechanism of radiation polymerization II. Mechanism of carbonium polymerization of styrene and methyl methacrylate under the action of γ rays

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 6, 1961, 828-832

TEXT: Previous studies of the authors (Ref. 1: Dokl. AN.SSSR. 124, 632, 1959) lead to the assumption that chains with ionic character form during copolymerization of an equimolar mixture of styrene and methyl methacrylate in ethyl chloride under the action of γ rays. The present work studies this influence in greater detail. Methyl methacrylate, treated with 3 % soda solution, was washed with water, dried over Na_2SO_4, distilled at 42.5°C at 101 mm Hg and stored in sealed evacuated ampoules over dry ice. The kinetics of the process were determined dilatometrically, the polymerization at 25. C, -40°C, and -78°C. The polymer was separated a) by removing the solvent and unreacted monomer in vacuo in the presence

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S/190/61/003/006/005/019
B110/B216

Studies of the mechanism of radiation...

of CuSO$_4$, and b) by precipitating the polymer by means of methyl alcohol in the presence of hydroquinone. The composition of the copolymer was determined by ultimate analysis for carbon and hydrogen carried out in the Vladimirskiy NIIS by Yu. A. Tsarfin and K. G. Nogteva. The infrared spectrum was taken in a solution containing 10 g of polymer to 1 l of CCl$_4$ at a thickness of 0.5 mm, with bands at 1725 cm^{-1} (CO group) and 700 cm^{-1} (benzene rings of polystyrene). Table 1 gives the copolymers obtained in 4.03 mole/l of ethyl chloride, isolated by method a). The copolymers prepared in this way could contain radiolytic by-products of the reaction mixtures. The copolymers prepared by b) (Fig. 2) contain more of the styrene component than those prepared by a). This is due to the formation of a low-molecular, non-volatile, CH$_3$OH soluble product containing more of the methyl methacrylate component than the copolymer prepared by b). It contained chlorine, had a molecular weight of 361 and showed strong absorption at 1725 cm^{-1} (CO group) and 700 cm^{-1} (benzene ring). The initial polymerization rate was determined from the curve sections in Fig. 4. Fig. 5 shows the dependence of styrene and methyl methacrylate polymerization on the composition of the initial monomer mixture. The

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styrene concentration is a linear function of the monomer concentration. Table 2 illustrates the dependence of the styrene polymerization rate on the surface of the reaction vessel. At -78°C, the use of ampoules made of stainless steel reduced the rate of styrene polymerization. The polymer molecular weights at an initial molar ratio styrene : methyl methacrylate of 0.9:0.1 were determined by N. V. Makletsova by the light scattering method at 70,000 for polystyrene and 30,000 for the copolymer. In copolymerization under the action of γ-radiation, lowering of the reaction temperature from 25°C to -78°C increases the relative content of styrene component (r_1(styrene) = 20; $r_2 = 0.005$). On polymerization of these monomers under the action of γ-radiation at 25°C, $r_1 = 0.63$; $r_2 = 0.50$. In the case of a peroxide-initiated polymerization at 60°C, $r_1 = 0.52$; $r_2 = 0.46$. With cation catalysts, $r_1 = 10.5$; $r_2 = 0.1$ and with anion catalysts $r_1 = 0.1$; $r_2 = 6.0$. The copolymer composition and the dependence of the copolymerization rate on the composition of the monomer mixture (Fig. 5) indicate a carbonium mechanism of polymerization of styrene with methyl methacrylate at low temperatures under the action of γ rays. Fig. 5

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shows that the addition of (~ 10 mole%) methyl methacrylate inhibits polymerization to a greater extent than the addition of isobutylene, but not as strongly as acrylonitrile addition. From this it is concluded that the inhibition increases with increasing electronegativity of the substituent at the double bond of the added monomer. There are 6 figures, 2 tables, and 10 references: 5 Soviet-bloc and 5 non-Soviet-bloc. The three references to English-language publications read as follows:
Ref. 3: R. Worrall, A. Charlesby, Journ. Appl. and Isot., 4, 84, 1958;
Ref. 5: W. J. Burlant, D. H. Green, J. Polymer Sci., 31, 227, 1958;
Ref. 7: A. Shapiro, V. Stannett, J. Chim. Phys., 56, 830, 1959.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova (Scientific Research Institute imeni L. Ya. Karpov)

SUBMITTED: July 21, 1960

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2629
S/190/61/003/008/005/019
B110/B220

15 8620

AUTHORS: Abkin, A. D., Sheynker, A. P., Yakovleva, M. K.

TITLE: Study of the mechanism of radiation polymerization. III. Mechanism of carbonium radiation polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 8, 1961, 1135-1139

TEXT: Previously, the authors had studied the effect of gamma radiation on polymerization and copolymerization of isobutylene, styrene, and methyl methycrylate (MMA) dissolved in ethyl chloride and shown that they proceed at low temperatures (-78°C) according to the carbonium mechanism (Mezhdunarodnyy sympozium po makromolekulyarnoy khimii, SSSR, Moskva (International Symposium of Macromulecular Chemistry, USSR, Moscow) June 14-18, 1960; Vysokomolek. soyed. 3, 716, 1961; ibid., 3 828, 1961). Some ideas with regard to this mechanism are put forward in the present paper. The initiation of polymer chains is effected by interaction between a monomer molecule and a proton presumably originating from the solvent. The following experimental data are given in confirmation of this assumption:

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S/190/61/003/008/005/019
B110/B220

1) The polymerization rate is a linear function of the monomer concentration; 2) radiolysis of ethyl chloride at 78°C yields a product closely related to dichlorobutene as to molecular weight (132) and refractive index (n_D^{20}=1.4812); 3) at -78°C the polymerization rate of isobutylene "in mass" ($46.7\cdot10^{-6}$ mole/l·sec) is lower than in a solution of ethyl chloride (concentration of isobutylene 12.6 mole/l: $71.2\cdot10^{-6}$ mole/l·sec). The following mechanism is assumed: The growing carbonium ion ejects a proton which forms a free radical with the negative molecular ion (counter-ion) of the monomer. The participation of the negative monomer ion is proved by the fact that the polymerization is strongly inhibited in the presence of a monomer with electron-acceptor properties. The copolymerization of isobutylene and styrene as well as of styrene and MMA follows the equation: $\omega = \left[(\lambda + 1)(r_1A^2 + 2AB + r_2B^2)\cdot\omega_a\omega_b\right]/\left[\lambda\omega_b r_1A^2 + \chi\omega_a\omega_b AB + \omega_a r_2B^2\right]$, where ω is the total rate of copolymerization; A and B are the concentrations of the monomers A and B, respectively; ω_a and ω_b are the rates of separate

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polymerization of A and B, respectively; $\lambda = v_a/v_b$ is the ratio of the formation rates of active centers of A and B; $\chi = (k_{brA+B}/k_{incrA+B} + k_{brB+A}/k_{incrB+A})/v_b$, where k_{incr} = rate of chain growth; k_{br} is the rate of chain rupture. The two unknowns λ and χ can be determined experimentally from ω_a, ω_b, and from the copolymerization rates at different ratios of the monomers. Data obtained for the copolymers of isobutylene (A) and styrene (B): $\lambda = 4$; $\chi = 8 \cdot 10^6$; for styrene (A) and MMA (B) $\lambda = 10$; $\chi = 440 \cdot 10^6$. It was observed that the polymerization rate of styrene increased at -78°C with increasing surface of the reaction vessel. The authors established an effect that is analogous to that of solid admixtures observed by R. Worrall et al. (J. Appl. Rad. a. Isot., 4, 84, 1958). The monomer molecules adsorbed on the surface of the reaction vessel have a higher electron affinity than the molecules in the volume, and are able to capture secondary electrons. Thus, the lifetime of the carbonium ions effecting the polymerization process is prolonged. Moreover, the influence of the surface is confirmed by a reduction of the molecular weight of the

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polymer at -78°C when steel ampullae are used instead of glass ampullae. S. S. Medvedev is thanked for his interest. There are 2 figures and 7 references: 4 Soviet and 3 non-Soviet. The most important references to English-language publications read as follows: Ref. 4: A. Shapiro, V. Stannett, J. Chim. Phys., 56, 830, 1959. Ref. 6: F. R. Mayo, Ch. Walling, Chem. Revs., 46, 191, 1950. Ref. 7: R. Worrall, S. H. Pinner, J. Polymer Sci., 34, 229, 1959.

X

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

SUBMITTED: September 5, 1960

Card 4/4

15 9201 1372, 1436, 1474

27742
S/190/61/003/011/014/016
B110/B147

11.2211

AUTHORS: Ushakov, V. D., Mezhirova, L. P., Galata, L. A., Khusnutdinova, Z. S., Sheynker, A. P., Medvedev, S. S., Abkin, A. D., Khomikovskiy, P. M.

TITLE: Polymerization of styrene and butadiene with styrene in emulsions under the action of initiating redox systems. II. Effect of the nature of the reducing agent on the rate of polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 11, 1961, 1723-1729

TEXT: The effect of the reducing component of initiating systems and of the addition of a second reducing agent on the rate of polymerization is studied. Used were systems of hydroperoxides (HP) of isopropyl benzene (I) or p-tert-butyl isopropyl benzene (II) with ferropyrophosphate complex (III), potassium ferrocyanide (IV), ferrous sulfate with o-phenanthroline, or of complexes of α,α-dipyridyl with ferrous oxalate. Sodium bisulfite and the bisulfite compound of acetone served as reducing

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B110/B147

Polymerization of styrene and...

agents (without metals of variable valency). Monoethanolamine, dioxyacetone (V), sodium bisulfite, and the bisulfite compound of acetone were [illegible] reducing agents. Their effect was investigated with systems [illegible] HP of different initiating activity and two complex compounds of bivalent iron. The ratio hydrocarbons (70 % by weight of styrene : 30 % by weight of butadiene) : water was 1 : 4. 2.8 % by weight of emulsifier (Nekal, Mersolate) were used. Optimum rate of polymerization was obtained at 0.34 % by weight of HP I and 0.2 % by weight of HP II (related to monomer). At the copolymerization butadiene-styrene by means of HP I + III, the optimum rate of polymerization was established for $FeSO_4 \cdot 7H_2O$ and $Na_4P_2O_7 \cdot 10H_2O$ = 0.75 : 1. Increase of the concentration of III from 0.55 to 0.70 moles/mole of HP I accelerates the process considerably. After 4 hr, the polymer yield increases to ~ 48 % at an increase of III from 0.2-0.35 moles/mole of hydrogen peroxide, and to 65 % at a further increase. At 5°C, additional reducing agents hardly affect the rate of polymerization. At 20°C, addition of V to I + III causes polymerization acceleration and 75 % monomer conversion after 3 hr, which is only 40 % without V. In the system II and III, optimum polymer yield is achieved at 1.5 moles of III per mole of HP II. For IV, an optimum yield

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is achieved after 4 hr at a ratio 0.5 IV : 1 HP. The high rate of polymerization for systems with III is caused by the low solubility of III in water. The redox potential of III is -200 mv. In dissolved state, it reacts with HP, but dissolves only slowly. This causes the great depth of conversion. IV with high positive potential (420 mv) is soluble [illegible]. The rate of initiating is determined by interaction of HP with IV. Polymerization is not initiated during the unproductive reaction of well soluble NaHSO$_3$ and well soluble HP I. NaHSO$_3$ and poorly soluble HP II initiate polymerization. The effect of IV on III at 20°C consists in the regeneration of the Fe^{2+} from the Fe^{3+} ions, thereby the depth of conversion increases. There are 3 figures and 7 references: 4 Soviet and 3 non-Soviet. The [illegible] most recent references to English-language [illegible] read as follows: [illegible] T. Wall, T. Swoboda, J. Amer. Chem. [illegible] Ruyling, Industr. and Engng Chem., 41, 286, [illegible]

[illegible] Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

[illegible], 1961

USHAKOV, V.D.; MEZHIROVA, L.P.; GALATA, L.A.; KHUSNUTDINOVA, Z.S.;
SHEYNKER, A.P.; MEDVEDEV, S.S.; ABKIN, A.D.; KHOMIKOVSKIY, P.M.

Polymerization of styrene and of butadiene with styrene in emulsions initiated by redox systems. Part 2: Effect of the nature of reducing agents on the polymerization rate. Vysokom. soed. 3 no.11:1723-1729 N '61. (MIRA 14:11)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova.
(Styrene) (Butadiene) (Polymerization)

S/0000/63/000/000/0208/0212

ACCESSION NR: AT4020709

AUTHOR: Sheynker, A. P.; Yarov, A. S.; Auer, A. L.; Abkin, A. D.

TITLE: Investigation of the radiation-induced polymerization of methylmethacrylate and butadiene at temperatures above and below their melting points

SOURCE: Karbotsepny*ye vy*sokomolekulyarny*ye soyedineniya (Carbon-chain macromolecular compounds); sbornik statey. Moscow, Izd-vo AN SSSR, 1963, 208-212

TOPIC TAGS: polymerization, radiation polymerization, ethyl chloride, butadiene, methylmethacrylate, isotactic polymer, syndiotactic polymer, cryostat, low temperature polymerization

ABSTRACT: The effect of temperature on the rate of polymerization of methylmethacrylate and butadiene under the influence of x-rays from cobalt-60 was investigated over a wide range (from 20 to -110C for methylmethacrylate and from 0 to -196C for butadiene). The rate of polymerization of methylmethacrylate decreased with decreasing temperature. The molecular weight of methylmethacrylate polymers also decreased with decreasing temperature of polymerization from 19 to -50C. However, during the polymerization of methylmethacrylate in the solid phase close to the melting point of the monomer, the molecular weight increased considerably. Density data on polymethylmethacrylate showed that at -50 and -60C an isotactic-

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S/190/63/005/004/001/020
B101/B220

AUTHORS: Mezhirova, L. P., Smigasevich, Z., Sheynker, A. P., Abkin, A.D.

TITLE: Carbanion mechanism of gamma ray initiated polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 4, 1963, 473-478

TEXT: The Co^{60} gamma ray initiated polymerization of acrylonitrile (AN) and copolymerization of AN with styrene (St) and methyl methacrylate (MMA) are discussed. Results: (1) At -78°C the polymerization of AN initiated by gamma irradiation was successful in triethyl amine only, while at 0°C the electron donor or acceptor properties of the solvents (triethyl amine, ethyl chloride, acetonitrile or butyronitrile) had no effect on the polymerization. (2) When copolymerization of AN with St was initiated by gamma rays, copolymers enriched with AN formed at low temperatures, while at normal temperatures an azeotrope characteristic of the radical polymerization of these monomers was formed. (3) Copolymerization of AN with MMA, initiated by gamma rays, yielded in triethyl amine at -78°C a polymer enriched with AN, independently of the initial ratio of the monomers. $r_{AN} = 7.0$, $r_{MMA} = 0.05$, these values being close to those for catalytic

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Carbanion mechanism of gamma ray ... S/190/63/005/004/001/020
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anionic polymerization. (4) The kinetics differs from that of radical polymerization. MMA polymerizes more slowly ($0.04 \cdot 10^{-5}$ mole/l·sec) than AN ($0.96 \cdot 10^{-5}$ mole/l·sec). (5) These differences confirm the carbanion mechanism suggested by the authors for the polymerization and copolymerization of AN by gamma irradiation at low temperatures. There are 3 figures and 2 tables.

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

SUBMITTED: August 26, 1961

Card 2/2

L 39481-65 EWG(j)/EWT(l)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/T/EWA(h)/EWA(c)/
EWA(l) Pz-6/Pc-4/Pr-4/Ps-4/Peb/Pu-4 IJP(c)/RPL WW/GG/AT/RM
ACCESSION NR: AP4007545 S/0020/63/153/006/1378/1380

50 B

AUTHOR: Mezhirova, L. P.; Sheynker, A. P.; Abkin, A. D.

21

TITLE: Effect of semiconductor-type additives on the radiation polymerization of acrylonitrile and methylmethacrylate

SOURCE: AN SSSR. Doklady*, v. 153, no. 6, 1963, 1378-1380

TOPIC TAGS: acrylonitrile, methylmethacrylate, radiation polymerization, semiconducting additive, zinc oxide, titanium dioxide, chromium oxide, chromium sesquioxide, Cr sub 2 O sub 3, magnesium oxide, copper oxide, cuprous oxide, Cu sub 2 O, nickel oxide, NiO, polymerization, acrylonitrile, polymer, methacrylic acid, methyl ester, polymer

ABSTRACT: The effect of semiconductor-type additives on the radiation polymerization of acrylonitrile and methylmethacrylate was studied. These monomers tend to undergo anionic polymerization, under the influence of γ-rays (Co^{60}, 20,000 r.) at low temperatures in the presence of semiconductor-type additives

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L 39481-65

ACCESSION NR: AP4007545

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ZnO, Cr_2O_3, TiO_2, MgO, Cu_2O, Ni_2O, or $Ni_2O + Li_2O$, which has been heated previously under vacuum at 100C for 6 hours (ZnO at 300C and MgO at 150C) and added in quantities to fill the whole monomer volume. Increase of the reaction surface decreased rather than increased the polymerization rate of the acrylonitrile. No increase was observed with ZnO and TiO_2 (n-type semiconductors) while the other oxides (p-type) considerably increased the polymerization rate and the polymer's molecular weight. The same applied to the acrylonitrile polymerization in triethylamine solution under the same conditions. No such effect occurred at higher temperatures (0C). At -196C MgO and Cu_2O increased solid acrylonitrile polymerization two fold which may be explained by the ionic mechanism of the polymerization under these conditions; IR spectroscopy indicated this to proceed at both =C=C- and -C-N-bonds. Similar results were obtained with methylmethacrylate in the presence of MgO at temperatures slightly below or above its melting point. The polymer obtained at -56C had high density which indicates itsstereo regular nature. Results are compared with those obtained under similar conditions for cation-polymerizing monomers. The mechanism of this effect is unknown to date. Orig. art. has: 2 figures and 1 table.

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L 39431-55

ACCESSION NR: AP4007545

2

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

SUBMITTED: 15Jul63

ENCL: 000

SUB CODE: GC, SS

NO REF SOV: 002

OTHER: 002

Card 3/3

ROZOVSKAYA, N.N.; SHEYNKER, A.P.; ABKIN, A.D.

Radiation-induced polymerization of methyl acrylate in ethyl chloride solution. Vysokom. soed. 7 no.8:1383-1387 Ag '65. (MIRA 18:9)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova AN SSSR, Moskva.

L 15630-65 EWG(j)/EWG(r)/EWT(l)/EWT(m)/FS(v)-3/EPF(c)/EWG(v)/EWP(j)/T/EWG(a)/
EWG(c)/EWA(h)/EWA(l) Pb-4/Pc-4/Pe-5/Pr-4/Peb ASD-3/AFFTC/AFMDC/AMD/APGC/ESD(gs)/
ESD(t)/ASD(m)-3/AS(mp)-2/AFETR DD/RM

ACCESSION NR: AP4043843 S/0020/64/157/005/1192/1195

8

AUTHOR: Popova, A. I.; Sheynker, A. P.; Abkin, A. D.

TITLE: On the mechanism of radiation induced polymerization of isobutylene and styrene in the presence of solid admixtures 19

SOURCE: AN SSSR. Doklady*, v. 157, 1964, 1192-1195 No 5

TOPIC TAGS: polymerization, copolymerization, radiation polymerization, isobutylene, styrene, solid admixture, glass powder, zinc oxide, polymerization temperature, radical mechaism, ionic mechanism, carbonium ion, polymerization constant, alkyl halide

ABSTRACT: The role of solid admixtures in such reactions was explored in the separate and copolymerization of the title products under the influence of gamma rays (70 rad/sec., Co^{60}) at 0C; using as admixtures glass powder or ZnO in quantities corresponding in volume to the volume of the liquid phase. The kinetics of separate polymerization was studied with the dilatometer, copoly-

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L 15630-65
ACCESSION NR: AP4043843

merization was conducted in ampuls. Results are compared with those published earlier, relating to tests at -78C. At 0C glass had no influence on polymerization while that of ZnO was considerable. The latter catalyzed isobutylene polymerization rapidly, also without irradiation, and its influence increased with time. The molecular weight obtained was about 20,000. Isobutylene and styrene copolymers obtained at 0C with irradiation but without ZnO were styrene-enriched, which points towards a radicalreaction mechanism. Copolymerization with ZnO led to isobutylene-enriched copolymers, pointing towards a ionic reaction mechanism. The copolymerization constants for 0C were 3. 3 and 0. 2 resp. for isobutylene and styrene with ZnO, 0. 5 and 3. 7 without ZnO. Decreasing the addition of either monomer led to a considerable decrease of the copolymerization rate. This latter was always lower than that of the separate polymerization reactions. The probable reasons are discussed. It was concluded that radiation-induced copolymerization at 0C proceeds by the radical mechanism in the absence of ZnO, by the ionic mechanism in its presence; the latter apparently increases the life of the carbonium ion in the reaction. This would confirm earlier assumptions on the role played by the surface in the development of

L 15630-65
ACCESSION NR: AP4043843

ionic radiation polymerization, probably related to the interaction of monomers with the protons forming in the chemi-adsorbed layer. Detailed data on the effect of alkyl halides on such reactions will be forthcoming. Orig. art. has: 4 figures.

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

SUBMITTED: 25Mar64 ENCL: 00

SUB CODE: GC NO REF SOV: 008 OTHER: 002

Card 3/3

POPOVA, A.I.; SHEYNKER, A.P.; ABKIN, A.D.

Mechanism of the radiation-induced polymerization of isobutylene and styrene in the presence of solid addition agents. Dokl. AN SSSR 157 no.5:1192-1195 Ag '64. (MIRA 17:9)

1. Fiziko-khimicheskiy institut im. Karpova. Predstavleno akademikom S.S. Medvedevym.

L 22532-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/T/EWA(b)/EWA(l) Pc-4/
Pr-4/Ps-4/Pu-4/Peb RPL GO/RM/WW

ACCESSION NR: AP4047949 S/0020/64/158/005/1159/1161

AUTHOR: Mezhirova, L. P.; Sheynker, A. P.; Abkin, A. D.

TITLE: The mechanism of radiation polymerization of acrylonitrile and methyl methacrylate in the presence of solid additives 19

SOURCE: AN SSSR. Doklady*, v. 158, no. 5, 1964, 1159-1161

TOPIC TAGS: acrylonitrile, methyl methacrylate, radiation polymerization, radiation polymerization mechanism, MgO, anionic polymerization, acrylonitrile methyl methacrylate copolymer

ABSTRACT: The radiation polymerization and copolymerization of acrylonitrile (I) and methyl methacrylate (II) in the presence of MgO, ZnO, powdered glass and other solid additives was investigated. The rates of the individual polymerizations and bulk copolymerizations of the two monomers at 0 and -50C in the presence of MgO were approximately an order higher than without MgO; at 0C the kinetic effects were not large-- only 1.5-2 times. In copolymerizations in the

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L 22532-65

ACCESSION NR: AP4047949

presence of MgO the copolymers were enriched in I, while without MgO, or with glass powder or ZnO, they were enriched in II. The mechanism of the radiation polymerization of I and II changed from radical polymerization without MgO to anionic polymerization upon addition of MgO. The yield of the ionic reactions increased on going from 0 to -50C. The effect of the nature of the solid additives on the polymerization was discussed. A possible source of the anionic polymerization centers is the carbanion $(CH_3-\underset{CN}{\underset{|}{C}}H)^-$, formed by the addition of an electron from the additive to the $CH_3.CHCN$ radical. The observed effects were thought to be associated with the participation of holes and electrons. Orig. art. has: 1 table and 3 figures

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

SUBMITTED: 09May64 ENCL: 00

SUB CODE: OC, GC NO REF SOV: 009 OTHER: 005

Card 2/2

L 1153-66 EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/T/EWA(c) RPL WW/GG/RM
ACCESSION NR: AP5022590 UR/0190/65/007/009/1500/1503
66.095.26+678.744/746 49
40
B

AUTHORS: Rozovskaya, N. N.; 44,55 Sheynker, A. P.; 44,55 Abkin, A. D. 44,55

TITLE: Copolymerization 7, 44,55 of methyl acrylate 7 with styrene 7 and acrylonitrile 7 in triethylamine solution. Third communication in the series "Investigation of the radiation polymerization machanism of methyl acrylate in various solvents at low temperatures" 7 14

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 9, 1965, 1500-1503

TOPIC TAGS: methyl acrylate, styrene, acrylonitrile, copolymer, polymer, anionic polymerization, radiation polymerization

ABSTRACT: The low temperature copolymerization of methyl acrylate with styrene and acrylonitrile in triethylamine solution was investigated. The investigation is an extension of experiments on the radiation polymerization of methyl acrylate in different solvents carried out by N. N. Rozovskaya, A. P. Sheynker, and A. D. Abkin (Vysokomolek, soyed., 7, 1381, 1965). The experimental method employed was described previously by A. P. Sheynker and A. D. Abkin, (Vysokomolek, soyed., 3, 716, 1961). The results are shown graphically (see Fig. 1 on the Enclosure).

Card 1/3

L 1153-66

ACCESSION NR: AP5022590

9

It was found that the copolymerization of methyl acrylate and styrene in triethylamine proceeds via a radical mechanism at 0C and via a radical or anionic mechanism at -78C, depending on the amount of styrene in the mixture. The copolymerization mechanism for the reaction between methyl acrylate and acrylonitrile changes from a radical one at 0C to an anionic mechanism at -78C. "The authors thank K. A. Samurskaya and I. N. Muromtseva for the elemental composition analysis of the copolymers." Orig. art. has: 3 graphs.

44,55 44,55

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-Chemical Institute) 44,55

SUBMITTED: 14Sep64 ENCL: 01 SUB CODE: OC, GC

NO REF SOV: 005 OTHER: 001

Card 2/3

L 1153-66

ACCESSION NR: AP5022590 **ENCLOSURE: 01**

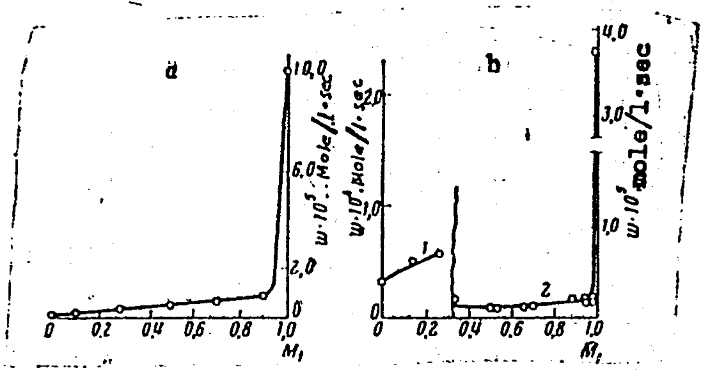

Fig. 1.

Dependence of the initial copolymerization rate of methyl acrylate (M_1) and styrene in triethylamine solution on composition of the monomeric mixture. (70 rad/sec): a- 0C, 2.5 mole/liter; b- -78C: 1- concentration 0.5; 2- 2.5 mole/liter

Card 3/3

ROZOVSKAYA, N.N.; SHEYNKER, A.P.; ABKIN, A.D.

Radiation polymerization of methyl acrylate in triethylamine and tetrahydrofuran solution. Vysokom. soed. 7 no.8:1388-1393 Ag '65. (MIRA 18:9)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova AN SSSR, Moskva.

L 2927-66 EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/T/EWA(h)/EWA(1) RPL WW/GG/RM

ACCESSION NR: AP5022607 UR/0190/65/007/009/1597/1603
66.095.26+678.742 47

44,55 44,55 44,55 43

AUTHORS: Popova, A. I.; Sheynker, A. P.; Abkin, A. D. 03

TITLE: Radiation polymerization of isobutylene in various solvents 14,44,55

17,44,55

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 9, 1965, 1597-1603

TOPIC TAGS: polymer, radiation polymerization, gamma radiation, isobutylene, inhibitor radiolysis, diisobutylene

ABSTRACT: The kinetics of radiation polymerization of isobutylene was investigated in methylene chloride, difluorodichloromethane, tetrafluoromethane, acetone, ethylpropylketone, and tetrahydrofuran. The preparation of test specimens and the experimental procedure are described. The polymerization was carried out at a monomer concentration ranging from 0.5 to 12.0 mole/liter, at -78C, 70 rad/sec. It was found that the rate of polymerization for isobutylene in methylene chloride and difluorodichloromethane at -78C under the effect of gamma rays is higher than in bulk polymerization. The rate of polymerization of isobutylene is decreased by the addition of previously irradiated polyisobutylene. The inhibitor of

Card 1/2

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L 2927-66

ACCESSION NR: AP5022607

polymerization--diisobutylene--is formed as a result of the polymer radiolysis.
The initial rate of polymerization is plotted against concentration of isobutylene.
A small amount of CF_2Cl_2 increases the rate of polymerization. This increase is
due to the formation of HCl resulting from the radiolysis of the reaction mixture.
Data concerning the effect of isobutylene concentration on the molecular weight of
the resulting polymers in difluorodichloromethane and methylene chloride show that
polymers of higher molecular weight are formed in difluorodichloromethane. It
was established that in the polymerization of isobutylene dissolved in alkyl
halides, the reaction of initiation by H^+ ions is highly important. The
polymerization is completely inhibited by acetone, tetrahydrofuran, and ethyl
propylketone. Tabulated data show the inhibiting effect of CF_4 on the polymeriza-
tion of isobutylene. The experimental data confirm earlier theories of the
protonic mechanism of the initiation of isobutylene polymerization under the
effect of nuclear radiations. Orig. art. has: 3 figures and 4 tables.

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

SUBMITTED: 19Oct64 ENCL: 00 SUB CODE: OC, OC

NO REF SOV: 010 OTHER: 013

Card 2/2

SHEYNKER, I. G.

6410' Investigation of Properties of AgCl Crystal "Ionization
Chambers.' L A. Geraseva, I. D. Rapoport, I. S. Shapiro, and I. G.
Sheinker. Doklady Akad. Nauk. S.S.S.R. 72, 261-4(1950) May 11
(in Russian).

A study was made of counters prepared from AgCl monocrystals, with silver-covered and surfaces obtained with the aid of a developer. The crystals, immersed in liquid N, were irradiated with monochromatic r rays from Co^{60} and with B particles from P^{32}, the pulse intensity was measured by the upper limit of the integral spectrum. A polarization effect, growing with time and impairing the efficiency of the counter, is observed soon after the beginning of work (1/2 hr.); it is due to the appearance of a heterogeneous electric field within the crystal, estimated at 5 x 10^3 v/cm after 2 hr. work with 10^3 ions/min. Depolarization can be obtained (other than by heating the crystal) by applying a field of opposite direction for a few minutes.

Moscow State Univ im. Lomonosov

26366
S/089/61/011/002/002/015
B102/B201

21.2200

AUTHORS: Smirnov-Averin, A. P., Galkov, V. I., Ivanov, V. I., Meshcheryakov, V. P., Sheynker, I. G., Stabenova, L. A., Krot, N. N., Kozlov, A. G.

TITLE: Study of a used fuel rod from the First Nuclear Power Station

PERIODICAL: Atomnaya energiya, v. 11, no. 2, 1961, 122-125

TEXT: This is the second part of a paper, the first having been published in "Atomnaya energiya" v. 8, no. 5, 1960, 446. Results of studies of used fuel rods from the Pervaya atomnaya elektrostantsiya (First Nuclear Power Station) are presented. The element jackets displayed no changes apart from some oxide stains. A comparison between the diameters of a new fuel rod with one after 104 and another after 445 effective burning hours showed that while the diameter had not increased at the upper and lower rod ends, it had grown by less than 0.2 mm in the middle. In order to measure the total α-, β-, and γ-activity, the used fuel rod was divided lengthwise into 10 sections, and each of these parts was dissolved in nitric acid. The α-activity was determined by a Да-49 (Da-49) standard device and an ionization chamber, the

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Study of a used fuel rod from the ...

β-activity by a 4π-counter, the γ-activity by an ionization chamber as compared to a radium standard. The activity of the inner and outer tubes bounding the fuel element was also measured; these tubes were made of stainless steel. In the middle, the activity of the outer tube was 30% higher than that of the inner tube. This effect can be explained by the change of the neutron spectrum along the diameter of the fuel element. The burn-up in the used fuel elements was determined on the strength of the absolute activity of cesium which was separated by an ion exchanger. The results of a radiometric determination of the burn-up were compared with mass-spectrometric results, and agreement was found to be good. The mean burn-up of the entire element was found to be equal to 53%. Finally, the isotopic composition of transuranic elements was also determined in the used-up fuel. The first part of the present paper has supplied the results of a radiometric determination of the isotopic composition in case of a 12.5% burn-up of the element. The results of a mass-spectrometric analysis are now given. The substance under investigation was to the emitter (tungsten foil, 40 μ) in the form of an aqueous nitrate solution. A thermal ion source served for the purpose. Results are presented in Fig. 5. They were used to calculate the mean values of isotopic composition. The

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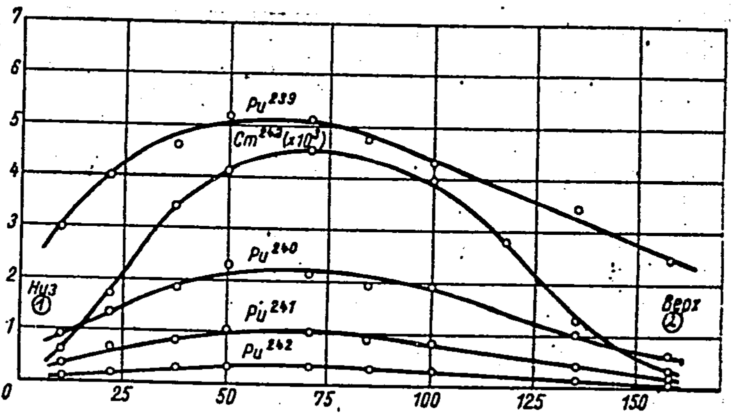
B102/B201

Study of a used fuel rod from the ...

following was found (in kg/ton of uranium): Pu^{239} - 4.10; Pu^{240} - 1.53; Pu^{241} - 0.64; Pu^{242} - 0.20; Cm^{242} - $2.73 \cdot 10^{-3}$. There are 5 figures and 2 Soviet-bloc references.

SUBMITTED: September 13, 1960

Fig. 5: Isotopic composition of transuranic elements along the fuel element. Legend: Ordinate: isotopic concentration in kg/ton of U; abscissa: length in cm; (1) bottom; (2) top.



Card 3/3

29547
S/089/61/011/005/012/017
B102/B104

26.2230

AUTHORS: Smirnov-Averin, A. P., Galkov, V. I., Sheynker, I. G., Meshcheryakov, V. P., Stabenova, L. A., Kir'yanov, B. S.

TITLE: Determination of burnup in spent fuel elements

PERIODICAL: Atomnaya energiya, v. 11, no. 5, 1961, 454 - 456

TEXT: The burnup of spent fuel elements was determined by determining the Cs^{134} accumulated as a result of an (n,γ) reaction with the stable isotope Cs^{133}, and Cs^{137}. The activity of the mixture $Cs^{134} + Cs^{137}$ was measured by scintillation gamma and beta spectrometers and a γ-β coincidence circuit. The apparatus gamma spectrum of the mixture had two photopeaks, the first was caused by the gamma radiation of Cs^{134} ($\overline{E}_{\gamma} = 0.80$ Mev), the second by a superposition of the photopeaks of Cs^{137} ($E_{\nu} = 0.66$ Mev) and Cs^{134} ($\overline{E}_{\gamma} = 0.59$ Mev). The internal conversion coefficient was determined from the beta spectrum of Cs^{137} to be 0.119

X

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B102/B104

Determination of burnup...

in accordance with the tabulated value. β-γ coincidences of the isotope mixture were only due to Cs^{134} radiation. From intensity and coincidence counting rate measurements the relative Cs^{137} content in the mixture was determined. The distribution of both the single isotopes and the mixture along the fuel rod had broad maxima in the middle of the rod. The burnup distribution was calculated from the Cs^{137} content. It was found to be in good agreement with mass-spectrometric measurements. The burnup may also be determined from the content of the Tc^{99} fission fragment ($2.2 \cdot 10^5$ years) which is produced in a yield of 6.02%. This isotope, which is the only long-lived one of this element, is extracted by methyl ethyl ketone after dissolving the material and centrifuging the precipitate. For final purification the cationite КУ-2 (KU-2) is used. Activity is determined with a 4π counter. The burnup determined from Tc^{99} was 67%, from the cesium mixture 68%, and from mass-spectrometric measurements 66.2%. There are 5 figures and 2 references: 1 Soviet and 1 non-Soviet. The latter reads as follows: Progress in Nuclear Energy, Ser. III, Process Chemistry, V. I, Appendix III, London, 1956.

SUBMITTED: September 15, 1960

Card 2/2

GIRKO, M.D.; SHEYNKER, I.G.

Selecting the design of the gearbox with a multiplate clutch for hydromechanical transmission of a very heavy motor vehicle. Avt. prom. 29 no.7:23-27 Jl '63. (MIRA 16:8)

1. Minskiy avtozavod.
(Motor vehicles—Transmission devices)

[illegible], [illegible]

"Zooprophylaxis and Its Epidemiological Significance." Thesis for degree of Cand. Medical Sci. Sub 7 Dec 50, Acad Med Sci USSR

[redacted] Summary 71, 4 Sep 52. Dissertations Presented for Degrees in Science and Engineering in Moscow in 1950. From Vechernyaya Moskva, Jan-Dec. 1950.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

γ

Adsorption on glass and the measurement of adsorbent surface. N. S. Shrinker. *J. Russ. Phys.-Chem. Soc.* 61, 413-21(1929).—With the aid of a precision micrometer, glass wool was sorted into portions differing by 0.002 mm. in diam.; the mean diam. was detd. for each portion by measuring the total length, sp. gr. and wt. The total surface of the adsorbent equaled 43.5 sq. cm. The expts. were carried out in a small pipet with about 0.2 cc. of the soln.; the exact vol. was detd. by weighing, and the concn. with the aid of a Koenig-Martens spectrophotometer and containers of 0.15-cc capacity. The results obtained with methyl violet BB and diamond fuchsin are in good agreement with those of Schmidt and Duran (cf. *C. A.* 18, 1598); the above dyes, being colloids, are probably adsorbed in a monomicellar layer. Brilliant safranine (mol. wt. 358.2) is adsorbed in a monomol. layer; the amts. adsorbed from dil. solns. are smaller than those predicted from Freundlich's isotherm. No increase in the adsorbent surface was caused by treatment with water and acids. The precision of the spectrophotometric readings is estd. at 2-3%.

B. Soyenkoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

V

2.

Study of the degree of dispersion of dyes by the diffusion
method. N. S. Sheinker. *J. Phys. Chem.* (U. S. S. R.)
4, 890-4(1933). The coeffs. of diffusion of dyes dissolved
in various water-alc. solns. were detd. by the Quast-
Ostwald method with the Auerbach exptl. set up. The
radii of the methylene blue particles varied from 0.39 ×
10^{-7} cm. in pure water to 0.21 × 10^{-7} in 70% alc., of
crystal violet from 0.57 to 0.26 and of neutral blue from
2.4 to 0.34 × 10^{-7}. The character of the change of degree
of dispersion of these dyes on going over from water to
water-alc. solns. indicates that in a water soln. the par-
ticles of neutral blue are strongly aggregated, of crystal
violet considerably less so, of methylene blue very little
or not at all aggregated. An app. for accurate diffusion
measurements is described. **Adsorption of dyes of vary-**
ing degrees of dispersion. *Ibid.* 895-70. In the ad-

sorption of dyes dissolved in water in a molecularly dis-
persed form, adsorption on the surface of glass is unimol.,
but if in the soln. the mols. are aggregated, the adsorbed
layer is unimicellar. Methylene blue B extra gave a
unimolecular adsorption layer on glass, neutral blue a
unimicellar, (2.18 mols. per micelle) and crystal violet
a unimicellar (1.6 mol. per micelle) F. H. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

C 1

2

A method for the study of the solvation and aggregation substances. N. S. Sheinker, R. E. Neiman and G. A. hilov. *J. Phys. Chem.* (U. S. S. R.) 6, 115-21(1935) n Russian); *Acta Physicochim. U. R. S. S.* 1, 795-804 935). -- Addn. of increasing amts. of water or of benzene o an EtOH soln. of ethyl violet at 30° at first decreases e size of the dye particles and then increases it. In eOH solns. such minimum is not observed on addn. of enzene but is observed on addn. of water. The solvate yer of EtOH is calcd. to be unimolecular. F. H. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

L

Apparatus for the measurement of diffusion. N. S. Sheinker. *J. Phys. Chem.* (U. S. S. R.) 8, 774–80 (1936).—An app. is described and its use illustrated by exptl. data on diamond fuchsin and brilliant cresyl blue.

F. H. Rathmann

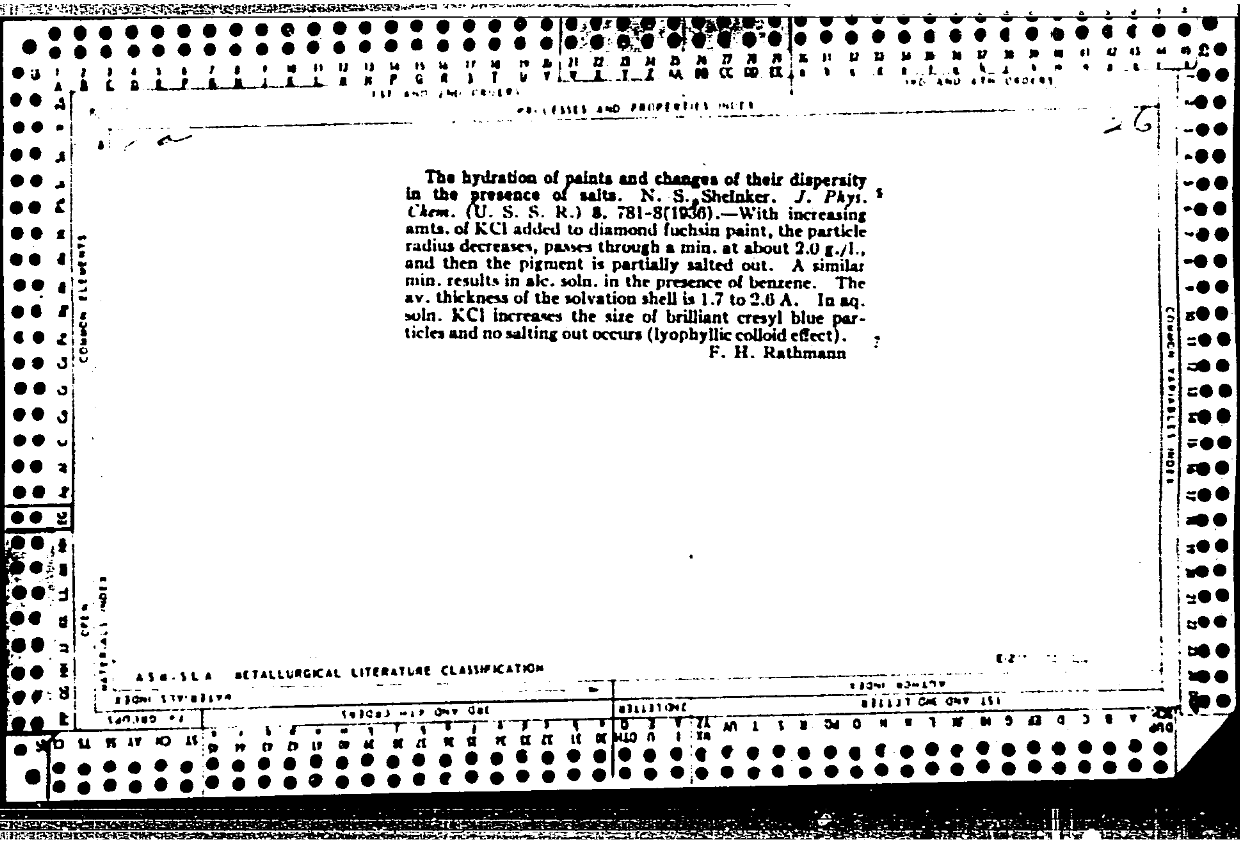
COMMON ELEMENTS

COMMON VARIABLE(S) INDEX

MATERIALS INDEX

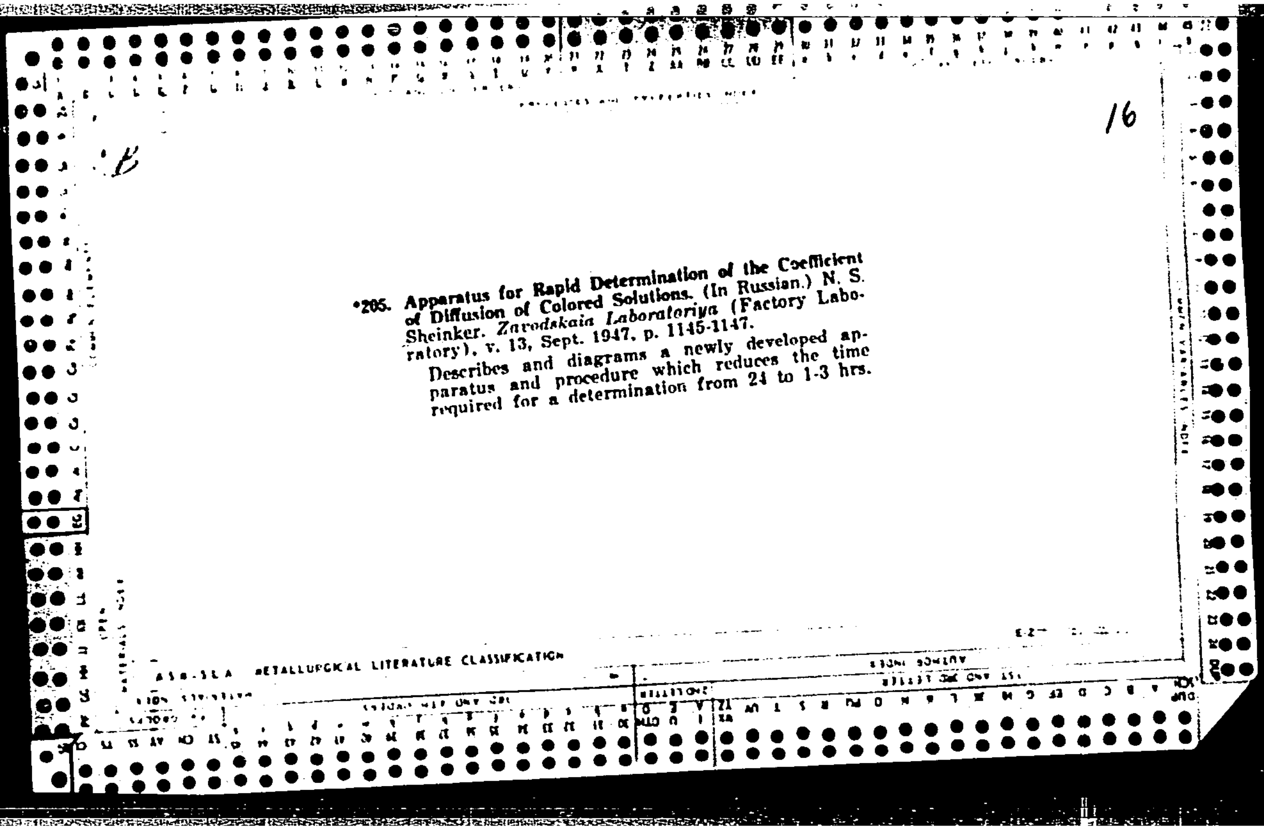
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

AUTHOR INDEX



The hydration of paints and changes of their dispersity in the presence of salts. N. S. Sheinker. *J. Phys. Chem.* (U. S. S. R.) 8, 781-8(1936).—With increasing amts. of KCl added to diamond fuchsin paint, the particle radius decreases, passes through a min. at about 2.0 g./l., and then the pigment is partially salted out. A similar min. results in alc. soln. in the presence of benzene. The av. thickness of the solvation shell is 1.7 to 2.8 A. In aq. soln. KCl increases the size of brilliant cresyl blue particles and no salting out occurs (lyophyllic colloid effect).

F. H. Rathmann



8

16

•205. **Apparatus for Rapid Determination of the Coefficient of Diffusion of Colored Solutions.** (In Russian.) N. S. Sheinker. *Zavodskaia Laboratoriya* (Factory Laboratory), v. 13, Sept. 1947, p. 1145-1147.

Describes and diagrams a newly developed apparatus and procedure which reduces the time required for a determination from 24 to 1-3 hrs.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

2

Study of the association of palmitic acid in polar solvents by viscosity and diffusion measurements. N. S. Sheinker. *Kolloid. Zhur.* 10, 57-68(1948).—Kuhn's (*C.A.* 26, 5474; 27, 2363) formula for the sp. viscosity η_s of elongated mols. in soln. is transformed by substituting, for the effective vol. φ of the dissolved substance per cc., the true vol. Φ from x-ray data; the conversion factor $\alpha = \Phi/\varphi$, gained from exptl. data of Meyer and Wijk (*C.A.* 28, 6009[1]), remains remarkably const. within the same class of dissolved substances (av. 2.34 for satd. hydrocarbons in CCl_4). The formula, further generalized by multiplying the length s of the mol. by a factor n indicating possible end-to-end polymerization, becomes $\eta_s = [2.5 + (n^2s^2/16 d^2)]\Phi/\alpha$, where d^2 = cross section of the mol. Similarly, the effective radius r_e in the formula for the diffusion coeff. $D = kT(f^*/f)/6\pi\eta r_e$, where the ratio f^*/f of the friction coeffs. of spherical and of ellipsoidal particles is given by the formula of Perrin (*J. phys. radium* [7], 7, 1(1936)), is replaced by the real radius r from x-ray data; the ratio r/r_e remains fairly const. within the same class of compds., e.g., $r/r_e \sim 4$ for normal alkyl halides in C_6H_6 (Herzog, *et al.*, *C.A.* 28, 2243[6]). The greater axis of the ellipsoidal mol. in Perrin's formula is again multiplied by the factor n. Measurements on solns. of palmitic acid (10 g./l.) in EtOH + H_2O mixts. at 25°, with H_2O = 0.3 –17.5% (limit of soly.), gave a fairly const. η_s = 0.027-0.024, indicating absence of significant solvation. Application of the transformed and generalized Kuhn equation to the exptl. data, with s assumed = 20.0 A., d^2 = 19.0 A.^{2}, Φ = 0.00816 cc., gives, for the fraction k of mols. present in the form of dimer, $k \sim 1$, i.e. palmitic acid in EtOH + H_2O solns. is practically all dimerized by end-to-end assocn. This holds largely also for solns. in Me_2CO + H_2O, except that, at 25°, η_s fluctuates somewhat irregularly with variation of the H_2O content, indicating simultaneous growth in both width and in length, with the latter predominating; the constancy of η_s is better at 15°. The dimerization of palmitic acid in 10 g./l. soln. is further confirmed by diffusion measurements in EtOH + H_2O; with 0.08, 4.3, 8.6, 12.8, and 15.6% H_2O, $10^6 D$ = 0.47, 0.40, 0.36, 0.28, and 0.27 cm.^{2}/sec., with $D\eta$ remaining fairly const. $\sim 518 \times 10^{-10}$. With n assumed = 2, the true radius calcd. from the formula for D with the aid of the exptl. data is found r = 5.6 A., in agreement with $r = sd^2$ = 5.7 A. calcd. for a spherical mol., whereas with n = 1 there is a considerable discrepancy. N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

CA

2

Generalized equation of diffusion through porous membranes and its practical utilization. N. S. Sheinker.

No. 5

Kolloid. Zhur. 10, 382-93(1948).—Diffusion of a solute through a porous membrane follows the equation $\log E - \log (A - c/c_0) = KDt$; c and c_0 are the original concns. of the two solns. in contact, D is the diffusion coeff., and t is the time since establishing the contact. In the previous treatments of the problem (cf. Vinograd and McBrain, *C.A.* 35, 5770[9]), only the diffusion after establishment of steady state within the pores was considered; the new treatment shortens the expt. by, e.g., 5 hrs. The consts. E, A, and K have a definite phys. meaning but must be calcd. from diffusion expts. on a compd. whose D is known. KCl was used as such compd., and the D of HCl was detd. in agreement with literature data. The membrane was a sintered-glass plate. D values were precise to within 1%. The above equation assumes c to be const. in the whole vol. of the dil. soln. To test this assumption for the case of a small difference in the d. of the 2 solns., the concn. of palmitic acid diffusing in H_2O-EtO mixts. was detd. near and far from the membrane; there was a considerable difference when the mixt. contained 20 wt. % H_2O, i.e. had d. almost equal to the d. of palmitic acid, but not at lower concns. of H_2O.

I. I. Bikerman

Lab. Physical Chem, Rostov State Pedagogical Inst.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SHEYNKER, N. S.

Sheynker, N. S. - "The heat of solvation of iodine in solutions of various colorations", (Report), Soobshch. o nauch. rabotakh chlenov Vsesoyuz. khim. o-va im. Mendeleyeva, 1949, Issue 1, p. 11-12.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

SHEYNKER, S., inzh.

Let's shorten the time required to build cement plants. Na stroi.Ros. no.2:30-33 F '61. (MIRA 14:6)
(Cement plants)

SHEYNKER, S.; FABRIKANT. L.

What construction of the Ul'yanovsk Cement Plant teaches. Na stroi. Ros. 3 no.2:4-6 F '63. (MIRA 16:2)

1. Zamestitel'nachal'nika otdela stroitel'nykh materialov i sbornogo zhelezobetona Gosstroya RSFSR (for Sheynker). 2. Upravlyayushchiy tresta TSemstroy Ul'yanovskogo soveta narodnogo khozyaystva (for Fabrikant).

(Ul'yanovsk—Cement plants)

SHEYNKER Ya. M.,

SHEYNKER, Ya.M., inzhener.

Efficiency promoter I.V. Pyrkov. Mashinostroitel' no.11:32-33 N '57. (MIRA 10:10)

(Pyrkov, Ivan Vasil'evich)

SHEINKER, Yu. N.

"Spectroscopic Methods of Studying Organic Pharmaceuticals," Med. Prom., No. 3, 1949.
Mgr., All-Union Sci. Res. Chemico-Pharmaceutical Inst. im. S. Ordzhonikidze, -c1949-.

CA

3

Vibrational spectra of organic azides. Yu. N. Sheinker
and Ya. K. Syrkin (Moscow Inst. Fine Chem. Technol.).
Izvest. Akad. Nauk. S.S.S.R., Ser. Fiz. 14, 478-87(1950).
Raman lines of NaN_3, $CH_2:CHCH_2N_3$, N_3CH_2COOEt,
N_3COOCH_3, $PhCON_3$, $C_6H_5N_3$, and $HOC_2H_4N_3$ are tabulated
nd the relative intensities of the 2 characteristic frequencies
f the N_3 group, $\nu(s)N_3$ (1177-1343 cm.$^{-1}$) and $\nu(as)N_3$
2080-2169 cm.$^{-1}$), are indicated. Absorption spectra in
he region 2.5-10 μ of $C_6H_5N_3$, N_3COOCH_3, $HOC_2H_4N_3$,
hN$_3$, N_3CH_2COOH, α-$C_{10}H_7N_3$, N_3CH_2COOEt, *p*-
rC$_6H_4N_3$, *p*-, *o*-, and *m*-$NO_2C_6H_4N_3$, and 2,4-$(NO_2)_2C_6H_3N_3$
re also represented. From the frequencies the force const.
f the N—N bond is calcd. to be 11.7 × 10^5 dynes/cm.,
lmost equal to the force const. of the N=N bond. In org.
zides the $\nu(s)$ frequency moves to smaller and the $\nu(as)$
frequency to larger values; this is attributed to a con-
figuration change of the group D_{∞}, and substantiated by
calcns. From the measurements deductions are made on
the configuration of azide compds. and the relative values of
the N—N and N=N bonds. In N_3COOMe 2 spatial con-
figurations in equil. and in N_3COOEt a H-bond are pre-
sumed to exist. Ultraviolet spectra confirm the observa-
tions made on Raman and infrared spectra. S. Pakswer

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Ultraviolet spectra of organic azides. Yu. N. Sheinker (M. V. Lomonosov Inst. Fine Chem. Technol., Moscow). *Doklady Akad. Nauk S.S.S.R.* **77**, 1043-5(1951). In alc. soln. (0.01-0.2 *M*) the typical aliphatic azides (EtN_3 and $N_3CH_2CO_2H$) show a characteristic absorption band at 2850 A., log K = 1.4. The N_3^- ion, in aq. soln. of NaN_3, shows a markedly different absorption, strongly shifted to shorter wave lengths and with strongly increased intensity. The 2850-A. band disappears in the presence of conjugation with the C:O double bond, as in N_3CO_2Me; its spectrum is intermediate between that of the aliphatic azides and the N_3 ion. This change of the absorption spectrum parallels the data of the vibration spectra (C.A. 45, 3240f). In aromatic azides, the intensity of the 2850-A. band is increased considerably, in PhN_3 by a factor of 5, and in $C_{10}H_7N_3$ by a factor of 8-10 as compared with EtN_3 or $N_3CH_2CO_2H$. This increase of the intensity indicates removal of the prohibition of the 1st transition of the benzene and naphthalene ring. In $NO_2C_6H_4N_3$ the spectra of the ortho and meta derivs. are very close and can be conceived as a superposition of the spectra of PhN_3 and of $PhNO_2$. The spectrum of the para deriv. is different, and the bands of the ring and of the substituents cannot be sepd. Evidently, the para position of NO_2 and N_3 in the ring gives rise to electronic levels linked with the mol. as a whole and no more with any single group, as in the ortho and meta derivs. N. Thon

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Ultraviolet absorption spectra of unsaturated oxazolones. Yu. N. Sheinker and B. M. Golovner. *Doklady Akad. Nauk S.S.S.R.* 79, 269-72(1951).—The spectra were detd. in 0.01-0.001 *M* solns. in alc. (in some cases in CCl_4) for 16 derivs. of O.CPh:N.C(:CHR).CO with R = Me (I); Cl (II); HO (III); KO (IV); EtO (V); NH_2 (VI); EtOCO-CH_2NH (VII); $Me_2C(SH)CH(CO_2Et)NH$ (VIII); PhNH (IX); HS (X); KS (XI); MeS (XII); $PhCH_2S$ (XIII); O.CPh:N.C(:CHS-).CO (XIV); $MeCONHC(CO_2H.C_5H_4N)$-HCH_2S (XV); —$SCH_2C(CO_2H.C_5H_4N)HNH_2$ or $HSCH_2C$-$(CO_2H.C_5H_4N)HNH$— (XVI). All these compds. are characterized by 2 absorption bands, with the longer-wave band more intense. Examples of wave lengths (and absorption coeffs. log *K*) are I 3050 A. (4.3) and 2400 (4.0); II 3150 (4.0) and 2450 (4.0); V 3200 (4.1) and 2400 (3.9); VII, VIII 3150 (4.5) and 2800 (3.9); XII, XIII 3600 (4.6) and 2600 (4.2). By the absorption bands, the debated structure of phenylpenicillenic acid ester could be identified with VIII, and the structures of pyridine salts of cysteine derivs. with XV and XVI. The structures of XII and XIII, synthesized by a new method, were confirmed by the absorption spectra. Replacement of an alkyl by a metal (V and IV) shifts the long-wave absorption band to longer waves by 250 A.; the same replacement in mercapto derivs. (XII and XI) causes a shift by 400 A. Introduction of a phenyl group instead of an alkyl in *N*-substituted derivs. (IX) produces a shift by 450 A., and in *S*-substituted derivs. (XIV) by 600 A. to longer waves. Replacement of an alkyl by H shifts the long-wave band to shorter waves, by 50 A. in amino derivs. (VI) and by 200 A. in mercapto derivs. (X). In solns. of the latter and of its K salt (XI) in alc., the 2 bands disappear owing to opening of the oxazolone ring. The short-wave band is less sensitive to the substituting atom on the methylenic C atom and particularly to the structure of the whole substituent group; thus, in all amino derivs., this band remains at 2800, and in all mercapto derivs. at 2600 A. N. Thon

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Liquid-vapor phase equilibrium in some binary systems. V. A. Kireev, ~~Yu. N. Shelaker~~, and E. M. Peresleni (S. Ordzhonikidze Chem. Pharm. Inst., Moscow). *Zhur. Fiz. Khim.* 26, 353-7(1952).—The phase equil. between liquid and vapor, at 760 mm. Hg, was investigated in a new type of app. resembling that of Gillespie (*C.A.* 40, 6061^1). The systems investigated were toluene-cyclohexanone (I), toluene-iso-BuOH (II) and toluene-iso-PrOH (III). The figures in each bracket give, resp., the b.p. of the mixt., the compn. of the vapor in mol. % of toluene, and the compn. of the liquid (same units). For I: (110.4, 100.0, 100.0) (116.0, 94.3, 80.2) (120.3, 88.4, 66.0) (126.7, 75.6, 47.8) (131.2, 65.1, 35.6) (136.0, 57.1, 27.7) (140.3, 48.3, 20.9) (144.4, 35.1, 13.5) (149.5, 18.9, 8.2) (154.8, 0.0, 0.0). For II: (110.4, 100.0, 100.0) (107.2, 87.0, 96.5) (104.7, 77.3, 89.7) (103.8, 73.6, 87.0) (103.3, 71.2, 84.4) (102.5, 67.4, 80.3) (101.9, 64.1, 76.2) (101.4, 59.8, 68.2) (100.9, 57.0, 63.8) (100.6, 54.4, 58.8) (100.5, 53.6, 55.0) (100.8, 48.0, 44.1) (101.1, 44.2, 35.5) (101.2, 42.1, 33.3) (101.7, 36.3, 25.3) (101.9, 33.4, 21.1) (102.8, 26.7, 15.0) (103.6, 21.8, 11.4) (105.2, 13.1, 6.6) (108.0, 0.0, 0.0). For III: (110.4, 100.0, 100.0) (104.6, 82.1, 97.0) (96.6, 62.3, 92.2) (94.4, 56.6, 89.7) (91.0, 49.8, 85.1) (88.5, 43.8, 79.7) (86.6, 40.2, 74.4) (85.4, 37.8, 68.8) (84.0, 33.7, 60.3) (83.2, 31.0, 53.1) (82.2, 27.9, 42.6) (81.8, 24.5, 32.4) (81.5, 23.5, 29.6) (81.5, 21.9, 25.8) (81.4, 19.3, 22.0) (81.2, 17.6, 18.5) (81.2, 14.6, 14.2) (81.6, 8.2, 6.7) (82.3, 0.0, 0.0). Thus, systems II and III are azeotropic.

Michel Boudart

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Phase equilibrium of liquid and vapor in some binary systems at reduced pressures. Yu. N. Sheinker and B. M. Peresleni (S. Ordzhonikidze Chem.-Pharm. Inst., Moscow). *Zhur. Fiz. Khim.* 26, 1103-9(1952).—Exptl. data are shown in 6 tables and 5 figures on the phase equilibria of the binary systems HCOOH-H_2O (I) at pressures of 50, 100, and 200 mm. Hg, and of BuOH-BuOAc (II) at 50, 165.5, and 760 mm. Hg. For I the azeotropic point moves in the direction of more HCOOH as the pressure rises, 66% at 50 mm., 69% at 100 mm., and 72% at 200 mm. Hg. For II the BuOH content is 37 mole % at 50 and 79% at 700 mm. Hg. At 165.5 mm. system II has a min. b.p. at 50% and 76.5°, with a sym. b.p.-compn. curve. Above 165.5 mm. BuOAc boils higher; below 165.5 mm. BuOH boils higher. The b.ps. of BuOAc are 126.1° at 760; 105.2° at 400; 85.7° at 200; 68.1° at 100; and 52.6° at 50 mm. Hg. F. H. R.

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Determination of the molecular weight of organic compounds from absorption spectra. Yu. N. Sheinker and B. M. Golovner (S. Ordzhonikidze All-Union Sci. Research Chem.-Pharm. Inst., Moscow). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 17, 681-8(1953).—To obtain mol. wts. of unknown compds., groups with characteristic absorption are introduced into the mol. of the substance. The absorption of the groups must be in another region than the absorption of the host compd. A suitable group is the picric acid radical. Picrates of 14 compds. were obtained and their mol. wts. detd. from absorption measurements and compared with mol. wts. derived from their formulas. The max. deviation was 3.3%. Another suitable group, especially for alkaloids, is the radical of picrolonic acid. The mol. wts. of trachelantamidine, sophoridine (from *Sophora pachycarpa*), sophoridine (from *Cuscuta*), and quinine were obtained and compared with their formulas. Styphnic acid can also be used as well as the Reinecke acid $H[Cr(NH_3)_2(SCN)_4]$. Mol. wts. of quinine, morphine, putrescine, salsoline, isothebaine, spherophysine, and nitrophenylaminopropanediol have been detd. by measuring their salts with the Reinecke acid. Methyl orange salts were formed from α-toluidine, and nitrophenylaminopropanediol, for detn. of mol. wts. Finally 2,4-dinitrophenylurethans from homopolar compds. can be used for the detn. of mol. wts. of alcs. Details of spectroscopic conditions for absorption measurements are indicated for each reagent. The max. error of the method is ±3%, and only 2 mg. of substance are required. S. Pakswer

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✓The process of decarboxylation of *p*-aminosalicylic acid and its sodium salt. Yu. N. Sheinker and I. V. Persiyanova. *J. Appl. Chem. U.S.S.R.* 26, 783-8(1953)(Engl. translation).—See *C.A.* 48, 9905g. H. L. H.

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"Investigation of the Process of Decarboxylation of p-Aminosalicylic Acid and Its Sodium Salt," Yu. N. Sheynker and I.V. Persiyanova, All-Union Sci-Res Chem-Pharm Inst im S. Ordzhonikidze

Zhur Prik Khim, Vol 26, No 8, pp 860-867

Studied the decarboxylation of p-aminosalicylic acid (PASK) to m-aminophenol by elimination of CO_2 in the temp range 60-100°C. At this temp the reaction is a typical topochemical, autocatalytic process, passing through an induction period and a stage of rapid decomp. Raising the temp

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increases the velocity of both stages. At room temp the induction period is prolonged and therefore the dry acid, with no catalysts, is practically stable at this temp. H_2O and m-aminophenol are catalysts for the decomp of PASK. The velocity of the decomp of PASK is independent of the initial pressure of CO_2 at pressures below 760 mm. The Na salt of PASK is stable in the temp range studied.

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