DIOSI, P.; HENTZIU, V.; BIRT, E.; LAZAR, L.; MITREA, I.

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1. Centre d'Hygiene, Brasov.

(STAPHYLOCOCCAL INFECTION in pregn)
(LABOR compl) (INFANT NEWBORN infect)

DIOSI, P.; SIMIONESCU, V.; HENTZIU, V.; LAZAR, L.; SOIU, J.; COMPANETZ, V.; RUSU, G.

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(DYSENTERY BACILLARY epidemiol)

GALEA, Gh., conf.; BUCUR, Gh., dr.; PETRESCU, R., dr.; IAMANDI, I., dr.; LAZAR, L., dr.; POPESCU, A., chim.

Changes in some serum lipids in chronic hepatitis and in hepatic cirrhosis. Med. intern. 15 no.6:679-685 Je '63.

1. Lucrare efectuata in Clinica medicala, Spitalul "Brincovenesc".
(HEPATITIS) (LIVER CIRRHOSIS)
(BLOOD LIPIDS) (BLOOD CHOLESTEROL)
(LIPOPROTEINS) (BLOOD PROTEIN ELECTROPHORESIS)

GALEA, Gh., conf.; HOANCA, O., dr.; LAZAR, L., dr.; DEMAYO, A., dr.

Osler-Rendu disease and hepatic cirrhosis. Med. intern. 15 no.8:1009-1016 Ag '63.

1. Lucrare efectuata in Clinica medicala a Spitalului "Brincovenesc", I.M.F., Bucuresti (director: prof. R. Brauner).
(ANGIOMATOSIS) (LIVER CIRRHOSIS)

DIOSI, P.; HENTIU, V.; BIRT, E.; LAZAR, L.; MITREA, I.

Research on the contamination of the parturient with pathogen staphylococci by way of the genitals and thransmission of the infection to the fetus during labor. Microbiologia (Bucur) 6 no.1:64 Ja-F '61.

[illegible] Radovanović and Lazar Lalić, First Surgical Clinic Medical [illegible] University, (I Hirurška Klinika Medicinskog fakulteta Univer- [illegible] and Dr Bogdan Radovanović, Belgrade.

[illegible] Fixation of Endometriosis.

[illegible] Srpski Arhiv za Celokupno Lekarstvo, Vol 90, no 3, Sep 1962: pp 271-273.

Abstract [French summary published]: Vulvar (right labium major) endometriosis in a 37-year-old woman who had had cesarean section 2 years earlier. Diagnosis relatively easy; excision; uneventful recovery. Two Yugoslav, 1 US references.

LAZAR, L.

New method of coloration of the myelin sheath, p. 1789.

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So. East European Accessions List Vol. 5, No. 9 September, 1956

MAROS, Tibor; KOVACS, Endre; MODY, Jeno; LAZAR, Laszlo

Changes in protein fractions of the blood following partial excision of the cerebral cortex and in lesions of certain regions of the central nervous system (hypothalamus, reticular formation). (Data on the problem of the regulation of protein metabolism by the central nervous system). Preliminary communication. Ideg.szemle 12 no.10:294-300 O '59.

1. A Roman Nepkoztarsasag Akademiaja Marosvasarhelyi (Tirgy-Mures) Kutatoallomasa Idegszovettani Laboratoriumanak (Vezeto: Dr. Maros Tibor eloado-tanar) es Biokemiai Laboratoriumanak (Vezeto: Dr. Kovacs Endre eloado-tanar) kozlemenye.

(BLOOD PROTEINS)
(CEREBRAL CORTEX physiol)
(HYPOTHALAMUS physiol)
(BRAIN STEM physiol)

MAROS, Tiberiu; KOVACS, Andrei; MODI, Eugen; LAZAR, Ladislau

Changes in the protein fractions of the blood consequent upon partial decortication and injury of nerv structures in the brain stem. Rumanian M Rev. no.1:182-185 Ja-Mr '61.

1. The Chair of Human Anatomy and Surgical Medicine (Head of the team: Assist. Prof. Tiberiu Maros) and the Chair of Biological Chemistry (Head of the team: Assist. Prof. Andrei Kovacs) of the Medicopharmaceutical Institute, Tg. Mures).
(BRAIN STEM physiology) (BLOOD PROTEINS)

MAROSH, T. [Maroş, T.]; LAZAR, L. (g. Tyrgu-Muresh)

Effect of largactil on the structure of the myelin sheaths of the peripheral nerves. Arkh.pat. no.7:60-62 '62. (MIRA 15:9)

1. Filial Akademii nauk Rumynskoy Narodnoy Respubliki (dir. - akad. D. Mishkol'tsi) g. Tyrgu-Muresh, Rumyniya.
(CHLORPROMAZINE) (NERVES, PERIPHERAL)

LAZAR, Ladislau; MAROS, Tiberiu

Contribution to the functional significance of in the incisures of Schmidt-Lantermann. Rev. sci. med. 7 no.1/2:51-54 '62.
(MYELIN SHEATH) (NEURONS)

MAROS, T.; LAZAR, L.; FORICA, Mm.

The action of some drugs (hyaluronic acid, hyaluronidase, cortisone) on lesions of the peripheral nerves in allergic encephalitis. Rev. sci. med. 7 no.3/4:157-162 '62.

(PERIPHERAL NERVE DISEASES) (MYELIN SHEATH)
(ENCEPHALITIS) (ALLERGY) (HYALURONIC ACID)
(HYALURONIDASE) (CORTISONE)

LAZAR, L.; MAROS, T.

Effect of temperature on the myelin sheath of the peripheral nerves. Acta morph. acad. sci. hung. 11 no.3:319-325 '62.

1. Nervenhistologisches Laboratorium (Leiter: Prof. Dr. D.Miskolczy) der Forschungsstation der Akademie der Rumanischen Volksrepublik, Tirgu-Mures.

(PERIPHERAL NERVES) (HEAT) (COLD)

The treatment of timber after drying and during processing.

p. 63 FAIPAR) Budapest, Hungary Vol. 7 no 2 June 1957

SO: Monthly Index of East European Acessions (AEEI) Vol. 6, no 11 November 1957

LAZAR, I.

Summary of experiences with the implements used in furniture-industry plants. p.71

FAIPAR. (Faipari Tudomanyos Egyesulet)
Budapest, Hungary
Vol. 9, no.3, Mar 1959

Monthly List of East European Accessions (EEAI) LC., Vol. 8, no.7, July 1959
Uncl.

DALOCSA, Gabor, dr., a muszaki tudomanyok kandidatusa; LAZAR, Laszlo, okleveles gepesmernok

Newer requirements for characterizing the quality of wood substituting materials. Faipar 10 no.10:301-305 O '60.

1. "Faipar" szerkeszto bizottsagi tagja (for Lazar).

BARIAI, Ervin, okleveles erdomernok; LAZAR, Laszlo, okleveles gepeszmernok

Research in the thermal pressing of chip boards. Faipar 10 no.9:262-272 S '60.

1. Faipari Kutatointezet, es "Faipar" szerkeszto bizottsagi tagja.

LAZAR, Laszlo, gepeszmernok; DALOCSA, Gabor, a muszaki tudomanyok kandidatusa

Edge durability examination in the process of cutting with special regard to Hungarian-made chip boards. Faipar 11 no.12:357-367 D '59.

1. Faipari Kutato Intezet. 2. "Faipar" szerkeszto bizottsagi tagja (for Lazar).

LAZAR, Laszlo, gepeszmernok

Experiences with the training of wood industry engineers. Faipar 13 no.2:45-48 F '63.

1. "Faipar" szerkeszto bizottsagi tagja.

LAZAR, Laszlo

Contingent of engineers and technicians in the wood and woodworking industries and the questions relating to the fulfillment of long-range demands. Faipar 12 no.8:225-230 Ag '62.

1. "Faipar" szerkeszto bizottsagi tagja.

LAZAR, Laszlo; TOKAY, Istvan

The situation and tasks of tool supply in the wood industry.
Faipar 12 no. 2:48-51 F '62.

1. "Faipar" szerkeszto bizottsagi tagja (for Lazar).

LAZAR, Laszlo

Wood fiber boards as building materials and experiences in the field of their application. Magy ep ipar 12 no.11/12:526-530 '63.

ROKA, Pal; FOLDESI, Erno (Gyor); RIEPERGER, Laszlo; SEY, Dezso (Gyor); BALAZS, Jozsef (Debrecen); GROSZ, Istvan (Szekesfehervar); DANI, Janos)Szeged); BODOGH, Istvan; DALOCSA, Gabor, dr.; LAZAR, Laszlo; BAKOS, Karoly, fomernok (Budapest); FABIAN, Laszlo, nyugdijas mernok; SZEP, Jozsef

Report on the Executive Committee session of the Scientific Association of the Wood Industry in Gyor. Faipar 14 no.6: 161-163 Je '64.

1. President, Scientific Association of the Wood Industry (for Roka).
2. Deputy Head, Wood industry Research Institute (for Dalocsa).
3. Head, Committee on Education, Scientific Association of the Wood Industry (for Lazar).

LYH BLUM, K.
LAZAR, L.B

The electrochemical chlorination of paraffin wax. Lya Blum Lazar (Polytech. Inst., Bucharest). *Bul. inst. politehnic Bucuresti* 20, No. 2, 109–11(1958)(in German).—Electrolysis of an emulsion of molten paraffin wax in HCl in a diaphragm cell at 90° with a Pt anode produces a yellow resin contg. as much as 50% Cl. Since the viscosity of the mixt. increases with progressing chlorination, addn. of CCl_4 can be used to keep the viscosity at a workable level.
I. P. Phillips

3

NICOLAU,I., prof. [deceased]; GHITA, N., dr.; OLARIU-UNGUREANU, Ana, dr.; DONOVAN, Silvia, dr.; LAZAR, Lucia, dr.; SERBANESCU, M., dr.

Aspects of malignant reticuloses in children. Pediatria (Bucur.) 13 no.5:447-457 S-O '64.

1. Lucrare efectuata in Clinica de pediatrie a Spitalului clinic "Fundeni".

LAZAR. M.

Amateur transmitters for the 3, 5, 7114 MHz. p. 108. RADIOAMATER. (Savez radioamatera Jugoslavije) Beograd. Vol. 10, No. 4, Apr. 1956.

SOURCE: East European Accessions List, (EEAL) Library of Congress, Vol 5, No. 8, Aug. 1956.

LAZAR, M

AGRICULTURE

Periodical: STUDII SI CERCETARI STIINTIFICE. SERIA STIINTE AGRICOLE
Vol. 4 no. 1/2, Jan./June 1957

LAZAR, M. Cultivation of maize by simple transplantation and the modifications which appeared in the transplanted maize. p. 139

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MURESANU, P.L.; CZEISLER, Ghizela; LAZAR, M.

Chemical and biochemical research on vegetable produce. Pt. 3.
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LAZAR, M.; ANDERCA, C.

Development of production forces and increase of the income of the Ortisoara Collective Farms, Banat region. Studii agr Timisoara 9 no.3/4:355-368 Jl-D '62.

GLUHOVSCHI, N.; LAZAR, St.; NAFORNITA, M.; LAZAR, M.

Carotene-deficient feed in gestating cows, a determining factor of the morbidity and mortality of newborn calves. Studii agr Timisoara 9 no.3/4:297-316 Jl-D '62.

NASTASE, Gh., Prof.; SPERANTA, Gh., dr.; CARNIOL, M., dr.; LAZAR, M., dr.; CAHANE, G., dr.; MARCULESCU, D., dr.

Studies of some serum antihyaluronidases in skin cancer.
Med. int., Bucur. 8 no.2:235-240 Apr-May 56.

1. Lucrare facuta in clinica dermato-sifiligrafica, Iasi.
(HYALURONIDASE, antagonists
in blood of skin cancer patients)
(SKIN NEOPLASMS, blood in
antihyaluronidases)

IAZAR, M.

NAASTASE, Gh.; SPERANJA, Gh.; CARNIOL, M.; IAZAR, M.; CAHANE, G.; MARCULESCU, D.

Investigations on certain seric anti-hyaluronidases during cancer of the skin. Rumanian M. Rev. 1 no.2:73-77 Apr-June 57.

(SKIN NEOPLASMS, blood in hyaluronidase antag.)
(HYALURONIDASE, in blood antag. in cancer of skin)

NICOLAU,St.G.,acad.; AVRAM,A.; ALTERES,I.; LAZAR,M.

Considerations in connexion with our experience concerning Candida infections. A clinical,mycological, and therapeutic study. Rumanian M. Rev. 3 no.4:43-44 O-D '59.
(MONILIASIS)

NASTASE, Gh., prof.; CARNIOL, M.; LAZAR, M.; LEIBOVICI, M.

Investigations on the capillarotoxic potency of blood serum in various dermatoses. Rumanian M Rev. no.4:59-62 O-D '60.
(SKIN diseases) (SERODIAGNOSIS)

POENARU, Elena; ESRIG, Mira; LAZAR, M.; LASCO, N.; KRANZDORF, H.

Contribution to the study of tetanus toxoid adsorbed on a mineral support, with or without previous purification. I. Arch. roum.path. exp. microbiol. 23 no. 3:667-674 S '63.

1. Laboratoire du Tetanos (for Poenaru, Esrig, Lazar, Lasco). 2. Laboratoire pour la Purification des antigenes (for Kranzdorf). Travail de l'Institut "Dr. I. Cantacuzino.", Bucarest.

LAZAR,M.; RADSEL-MEDVESCEK, A.; KOBLER,P.; SUHAC,M.

Respiratory center of the Ljubljana Infectious Clinic. Review of its activities from the establishment to the present time. Zdrav. vestn. 33 no.10:287-294 '64

1. Infekcijska klinika medicinske fakultete v Ljubljani (Predstojnik: prof. dr. M. Bedjanic).

JITARIU, P.; LASCU, N.; TOPALA, N.; LAZAR, M.

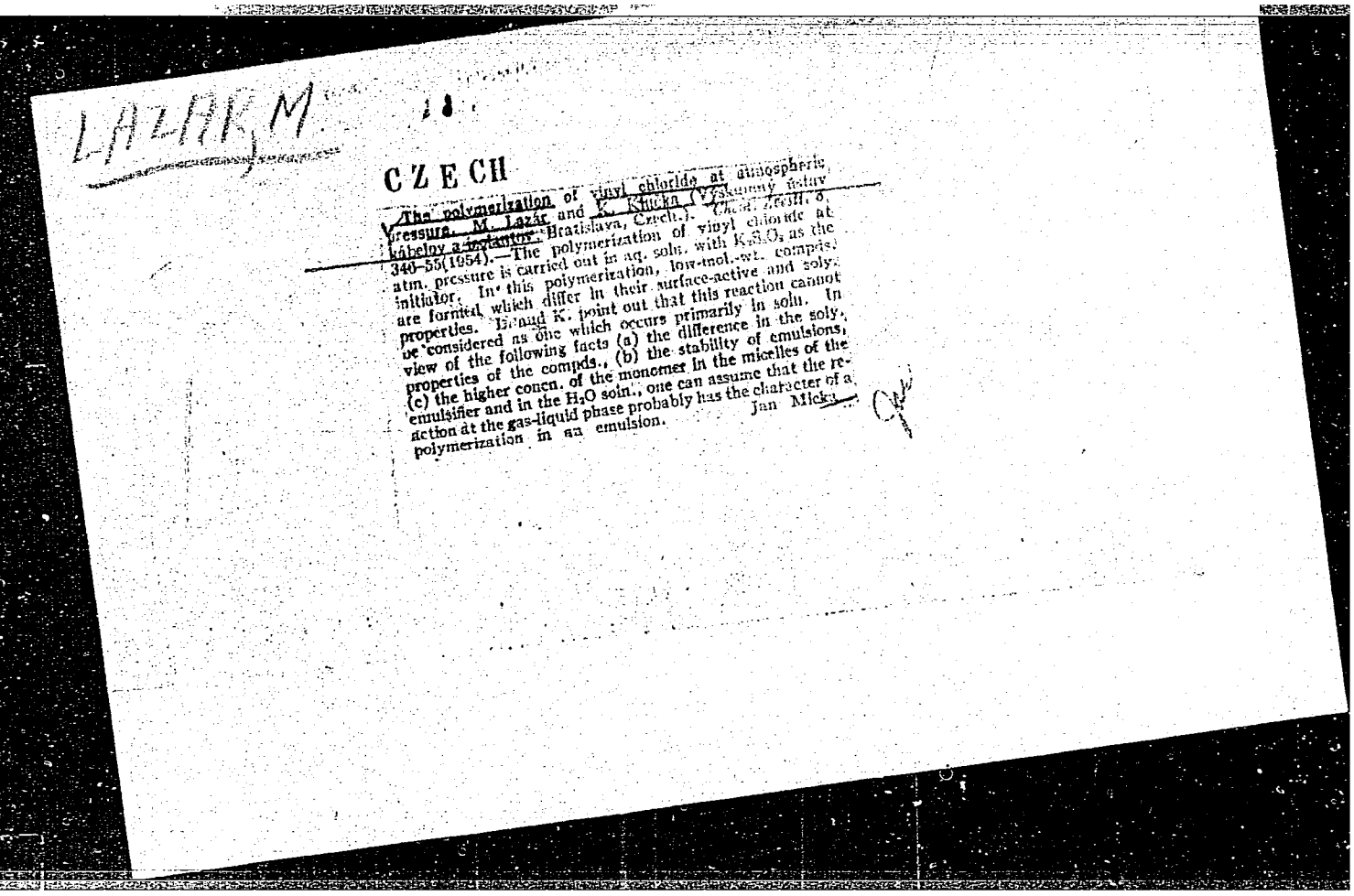
Action of the magnetic feilds on the antitoxic and antitetanic immunity of guinea pigs. Studii cerc biol s. zool 17 no.1:47-51 '65.

1. Chair of Animal Physiology, "Al.I.Cuza" University, Iasi, and the Cantacuzino Institute, Iasi. Submitted October 16, 1964.

LAZAR, M.

"Plastic materials containing fluorine." Technicka Praca, Bratislava, Vol. 6, No. 1, Jan. 1954, p. 49.

SO: Eastern European Accessions List, Vol. 3, No. 11, Nov. 1954, L.C.



LAZAR, M.

CZECH

The polymerization of vinyl chloride at atmospheric pressure. M. Lazár and K. Kliučka (Výskumný ústav káblov a izolantov, Bratislava, Czech.). Chem. zvesti 8, 340–55(1954).—The polymerization of vinyl chloride at atm. pressure is carried out in aq. soln. with $K_2S_2O_8$ as the initiator. In this polymerization, low-mol.-wt. compds. are formed which differ in their surface-active and solv. properties. Lazár & K. point out that this reaction cannot be considered as one which occurs primarily in soln. In view of the following facts (a) the difference in the solv. properties of the compds., (b) the stability of emulsions, (c) the higher concn. of the monomer in the micelles of the emulsifier and in the H_2O soln., one can assume that the reaction at the gas-liquid phase probably has the character of a polymerization in an emulsion.

Jan Micka

L 42492 [illegible]

Czechoslovakia/Chemical Technology. Chemical Products and Their Application -- Synthetic polymers. Plastics, I-

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6070

Author: Lazar, Milan

Institution: None

Title: Pressureless Polymerization of Trifluorochlorethylene

Original Publication: Chem. zvesti, 1956, 10, No 1, 74-77

Abstract: On polymerization of trifluorochlorethylene (I) in an aqueous medium without the use of pressure (in a manner analogous to the procedure used with other low boiling monomers) it was found that polymerization of I under the aforesaid conditions cannot be carried out. A procedure is described, for the polymerization of I in pentachlorethane at normal atmospheric pressure and 85°, using benzoyl peroxide as a catalyst, which resulted in the formation of a low molecular poly-trifluorochlor ethylene.

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LAZAR, M.

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2 M. A. YOUTZ
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The kinetic relations of the polymerization without pressure of trifluorochloroethylene in pentachloroethane. M. Lazár and R. Rado (Výskumný ústav káblov, Bratislava, Czech.). *Chem. Zvesti* 10, 1-9(1956)(German summary).—The kinetic relations are described for the polymerization (initiated by Bz_2O_2) in a soln. of C_2F_3Cl in C_5HCl_5. The method is based on the measurements of decrease of concn. of C_2F_3Cl during the polymerization reaction. The exponent of the dependence of the polymerization speed on the concn. of the initiator is 0.8 at 70-90°, which agrees with the findings of Thomas and O'Shaughnessy (*C.A.* 48, 3771a). The total active energy of the polymerization is 26 kcal./mol., and the active energy of the initiation process is 30.5 ± 1.5 kcal./mol. The initiation process is caused by the radicals from the soln., formed during the polymerization, and the growth of the polymer chain is as usual. The ending of the growth of the chain causes 2 reactions simultaneously, occurring by the termination of retardation and by the termination of recombination.

Jan Micka

Lazár, M.

7

2

The decomposition of benzoyl peroxide in pentachloroethane in the presence of trifluorochloroethylene. K. Rado and M. Lazár (Výskumný Ústav Káblový, Bratislava, Czech.). Chem. Zvesti 10, 202–7 (1956) (German summary). —The velocity consts. of spontaneous and induced decompn. of Bz_2O_2 in pentachloroethane (I) at 93.7° ± 0.1° and in the presence of trifluorochloroethylene (II) at 78.3°, 89.5°, and 95.7° ± 0.1 were detd. The velocity of the total decompn. can be expressed in the equation $-d[i]/dt = k_1[i] + k_i[i]^n$, where [i] is the concn. of Bz_2O_2, k_1 is the velocity const. of unimol. spontaneous decompn., and k_i is the velocity const. of induced chain decompn. Exponent $n = 2$ is the most suitable. The presence of II increases the decompn. of Bz_2O_2 in the soln. of I. In the polymerization without pressure of II in the soln. of I, initiated by Bz_2O_2, the effectiveness of the initiator is 0.56 ± 0.03. Jan Micka

LAZAR, M.

The polymerization of trifluorochloroethylene by γ-radiation. M. Lazár, R. Rado, and N. Kliman (Výskumný ústav káblov a izolantov, Bratislava, Czech.). *Chem. zvesti* 10, 585–8 (1956) (German summary).—The block polymerization of trifluorochloroethylene initiated by Co^{60} at various radiation temps. and intensities is described. In the limits of the ionization intensity 30–1000 r./hr., the polymerization rate is directly related to square root of the intensity of radiation. The inner viscosity of the polymers and the dependence of the polymerization rate and mol. wt. on temp. are discussed.
Jan Micka

LAZAR, MILAN

CZECHOSLOVAKIA/Chemistry of High Molecular Substances. I

Abs Jour: Referat. Zhurnal Khimiya, No 10, 1958, 34981.

Author : Rudolf Rado, Milan Lazár.
Inst : Not given.
Title : Thermal Degradation of Polytrichlorofluoroethylene.

Orig Pub: Chem. průmysl., 1957, 7, No 8, 457-459.

Abstract: The thermal dissociation of polytrifluorochloroethylene at 340° under atmospheric pressure was studied by the method of weight losses and change of characteristical viscosity dependent of the destruction duration. A mechanism of chain degradation based on the assumption of random initiation by C-C bond scission is suggested. The chain development consists in splitting off of monomer molecules. The

Card : 1/2

LAZAR, MILAN

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and Application. Synthetic Polymers. Plastics. H-29

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 26999

Author : Lazar Milan, Rado Rudolf
Inst : -
Title : Fluorinated Hydrocarbons and Their Derivatives as Thermostable Insulating Materials.

Orig Pub : Strojnoelektrotechn. casop., 1957, 8, No 1, 54-66

Abstract : A review article concerning current comcepts of the causes which bring about chemical inertness and thermal stability of polymeric fluorohydrocarbons and their derivatives. It is noted that the most promising course of development of new thermostable insulating fluoro-polymers is one of the following: copolymerization of tetrafluorethylene and hexafluoropropylene, synthesis of silicones in which organic radicals are substituted by

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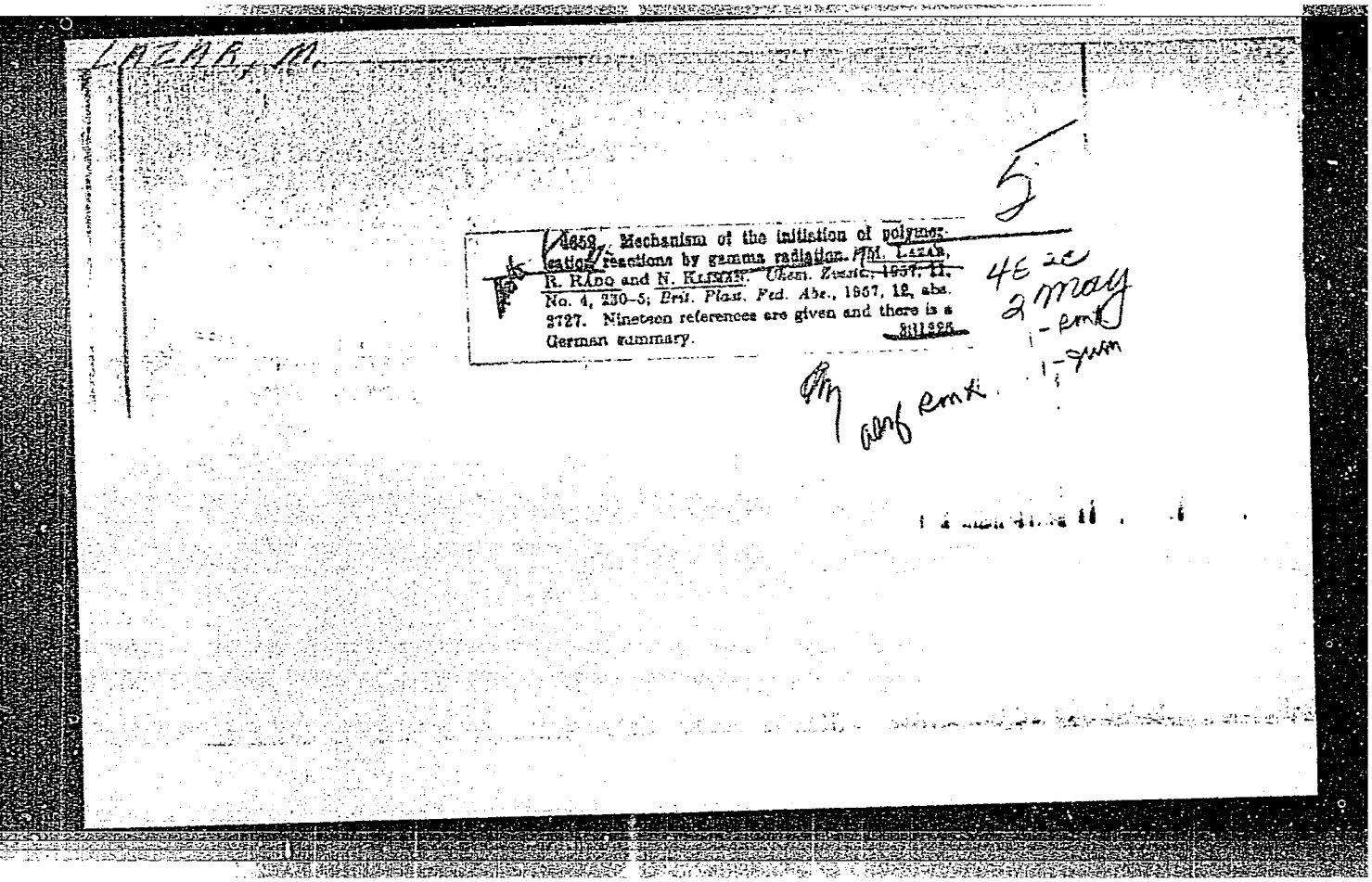

LAZAR, M.

4659. Mechanism of the initiation of polymerization reactions by gamma radiation. M. LAZAR, R. RÁDO and N. KLIMAN. *Chem. Zvesti*, 1957, 11, No. 4, 230–5; *Brit. Plast. Fed. Abs.*, 1957, 12, abs. 3727. Nineteen references are given and there is a German summary.

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LAZAR, M.

CZECHOSLOVAKIA/Chemistry of High Molecular Substances. I

Abs Jour: Referat. Zhurnal Khimiya, No 10, 1958, 34964.

Author : M. Lazar, R. Rado.
Inst : Not given.
Title : The the Question of Trifluorochloroethylene Polymerization in Pentachloroethane.

Orig Pub: Chem. zvesti, 1957, 11, No 7, 383-389.

Abstract: The polymerization kinetics of trifluorochloroethylene in pentachloroethane solution at 70 to 90° was studied; benzoyl peroxide was the initiator. It is shown that the reaction rate rises linearly together with the monomer concentration. The initiation rate (found by the inhibition method) is determined by the monomolecular decomposition of the initiator. It is assumed that the solvent participates in the initiation reaction.

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LAZAR, M.

MILITARY & NAVAL SCIENCES: GENERAL

Periodical NASA VEDA. Vol. 5, no. 10, Oct. 1958.

LAZAR, M. International conference on high-molecule polymers in Nottingham. p. 461.

mb. Results of scientific work. p. 462.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 3, March, 1959. Uncl.

COUNTRY : Czechoslovakia
CATEGORY :

ABS. JOUR. : RZhKhim., No. 21 1959, No. 77242

AUTHOR : Lazar, M. and Klíman, N.
INST. : Not given
TITLE : The Polymerization of Trifluorochloroethylene, Initiated by Gamma Rays. II. Effect of Pentachloroethane on the Rate and Degree of Polymerization.

ORIG. PUB. : Chem. zvesti, 12, No 10, 627-631 (1958)

ABSTRACT : The polymerization (P) of trifluorochloroethylene in bulk and in solution at temperatures of 25 and 52° has been investigated. The P of trifluorochloroethylene in pentachloroethane proceeds more rapidly than in bulk. In the bulk P, the rate decreases when the temperature is raised, an indication that chain propagation goes through the monomer. An increase in the temperature in the solution P leads to an increase in the P rate. For Communication I see RZhKhim, 1957, No 13, 44772.

From authors' summary

CARD: 1/1

LAZAR, M.

Distr: 4E2c(j)/4E3d

Influence of the solvent on the polymerization velocity of trifluorochloroethylene. M. Lazár (Research Inst. Cables and Insulating Materials, Bratislava, Czech.). *J. Polymer Sci.* 29, 573–8(1958).—The polymerization rate in bulk of C_2F_3Cl was measured, and the effect of pentachloroethane and other solvents on the polymerization rate was investigated. The polymerization expts. were performed in N atm. to a max. conversion of 20% of the monomer. The polymerization-rate values are computed by means of sq. root relation to the const. initiator concn., varying within 10%. The velocity of polymerization in bulk, established at 60.1 and 70.3°, is shown to agree with values of Thomas and O'Shaughnessy (*CA* 48, 3771a). When expressed in moles of monomer consumed per kg. of the polymerization system within 1 sec., the rate of 0.65*M* C_2F_3Cl in pentachloroethane is 3 to 5 times greater than in bulk. A smaller acceleration effect is noted with benzene and $CF_2ClCFCl_2$, and a significant inhibitory effect was noted with 1,3,5-trimethylbenzene. The increase in polymerization rate with increasing C_2F_3Cl concn., and its later decrease, show that the rate is dependent on the concns. of C_2F_3Cl and solvent.

Arthur Lyon

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1- BW (SW)
2- JAT (NB) (MAY)
2

LAZAR, M.

Polymerization of vinylidene chloride in the presence of solvents. A. Hrivík, M. Lazár, and S. Kovář (Slovenská vysoká škola tech., Bratislava, Czech.). *Chem. zvesti* 13, 117–23(1959)(German summary).—The polymerization of vinylidene chloride initiated by Bz_2O_2 (I) at 80° in the presence of 1,1,2-trifluorotrichloroethane (II), $CHCl_3$ (III), C_6H_6 (IV), and cyclohexanone (V) was described. Based on the concn. of monomer the effect of III on the order of reaction is 1, II from 1 to 3.5, IV from 2 to 1, and V from 1.3 to 0.7. It was detd. that for the concn. of monomer 5.033 moles/l. and for the concn. of 18.26×10^{-3} mole/l. at 60–80°, the total activation energy was 21 kcal./mole for these solvents. The activation energy for block polymerization of vinylidene chloride was 16.0 kcal./mole, in good agreement with previously published data. Jan Micka

LAZAR, M.

Distr: 4E3b/4E2c(j)

Copolymerization of trifluorochloroethylene with vinyl chloride and vinylidene chloride. Norbert Klíman and Milan Lazár (Výzk. úst. káblova izolantov, Bratislava, Czech.). *Chem. průmysl* 9, 068–70(1959).—Trifluorochloroethylene (I) was copolymerized with vinyl chloride (II) or vinylidene chloride (III) at 60° with Bz_2O_2 as initiator; the compn. of the copolymer formed being calcd. from the Cl content. From the data obtained, the copolymerization parameters were calcd. for I + II (r_1 = 0.01, r_2 = 2.53), and for I + III (r_1 = 0.02, r_2 = 17.14); with respect to the unfavorable values for I + II the tech. application is very complicated, and for I + III almost impossible. The course of the change of the copolymer compn. was calcd. with different initial ratios of I:II and with changing compn., and the result is presented in the form of a diagram. Values were calcd. for Q = 0.013 (0.021), and e = 1.9 (1.6) for I with II and III, resp. (The const. Q describes the "general monomer reactivity" and the const. e takes account of polar factors influencing copolymerization.)

J. Šebenda

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1-gg (WB)
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DR

LAZAR, M.

PHASE I BOOK EXPLOITATION SOV/4984

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Tech. Ed.: P. S. Kashina.

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

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

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

33

89592

S/190/61/003/002/010/012
B101/B215

15.8101

AUTHORS: Rado, R., Lazàr, M.

TITLE: Process of cross linking in polyethylene caused by peroxide

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 2, 1961, 310-318

TEXT: The authors studied the process of structurization of polyethylene (PE) by cross linking due to benzoyl peroxide (BP). PE samples containing BP were produced. Undecomposed BP was iodometrically determined after heating in an inert atmosphere; benzoic acid formed by decomposition was alkalimetrically determined; liberated CO_2 was gravimetrically determined. Cross links were calculated on the basis of A. Charlesby's (Ref. 10, see below) ratio between solubility and degree of cross linking. Table 1 gives the data of the BP decomposition in PE. Table 2 those on the formation of cross links. It was concluded that the decomposition of BP is a) continuous (rate constant k_1), and b) induced after reaction of the second order (rate constant k_i). The following equation holds for the

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total decomposition: $-d[BP]/dt = k_1[BP] + k_i[BP]^2$ (1). Solution of this equation and transformation give $[BP]_t = [BP]_o / [A(a+1) - a]$ (2), where $A = \exp k_1 t$: $a = k_i/k_1$. k_1 and k_i, and the constant k_t were calculated. The equation $X_1 = (k_1/k_i)\{2.303 \log[A(a+1) - a] - k_1 t\}$ (3) holds for continuous decomposition, $X_2 = (k_1/k_i)\{(a+1) - A(a+1)/[A(a+1) - a] - 2.303 \log[A(a+1) - a]/A\}$ (4) for induced decomposition; and for k_t: $k_t = \Delta RH/\{2.303 \log[A(a+1) - a] - k_1 t\}$ (8). The constants obtained by calculation are given in Table 4. The calculation of the reaction is such: $BP \xrightarrow{k_1} 2R^\bullet$; $R^\bullet + BP \xrightarrow{k_2} R^\bullet + CO_2 + RX$; $R^\bullet + PH \xrightarrow{k_3} P^\bullet + RH$; $P^\bullet + P^\bullet \xrightarrow{k_4}$ / $P^\bullet + R^\bullet \xrightarrow{k_5}$ products of deactivation; breaking off of the chain re-

action. (PH = polyethylene, RH = benzoic acid). The efficiency of cross linking depends on the ratio of the reactions $P^{\cdot} + R^{\cdot}$ and $P^{\cdot} + P^{\cdot}$; in the first case, it is zero, in the second case $k_1 [BP]_t$. The rate of structurization is such: $d[P\text{-}P]/dt = (k_i k_t - k_1)[BP]_t$ (9). By substituting $[BP]_t$ in Eq. (2), the following expression is obtained: $[P - P] - (k_t - k_1/k_i) \{2.303 \log[A(a + 1) - a] - k_1 t\}$ (10). The data calculated and those obtained are compared in Fig. 3. Hence, the following conclusions are drawn: 1) at low temperatures only a breaking off of the reaction occurs due to cross linkage among the polymer radicals; 2) the reaction mechanism changes at higher temperatures. Interaction among primary radicals and the polymer takes place; 3) if the temperatures are still higher, the latter reaction prevails. This is explained by the considerable difference between the activation energy of the independent BP decomposition and that of the transfer, and also by different changes in the reaction rates. BP, which did not decompose monomolecularly, is ineffectively lost. The process of transfer determining the

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B101/B215

number of cross links among the polymer radicals, plays an important role. The reaction rate also depends on the difficult diffusion of substances in PE. There are 4 figures, 5 tables, and 19 references: 7 Soviet-bloc and 11 non-Soviet-bloc. The 3 references to English language publications read as follows: A. Charlesby, Atomics, 5, 12, 1954; H. C. Haas, J.Polymer Sci., 39, 493, 1959; R. Rado, M. Lazàr, J.Polymer Sci., 45, 257, 1960.

ASSOCIATION: Scientific Research Institute for Cable and Isolation Material; Chemical Institute of the Slovakian Academy of Sciences, Bratislava

SUBMITTED: October 26, 1960

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25775
S/190/61/003/006/018/019
B110/B208

15.8107 2209

AUTHORS: Lazar, M., Pavlinec, I., Mañasek, Z., Mičko, M., Berek, D.

TITLE: Ozonization of atactic polypropylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 6, 1961, 943 - 947

TEXT: One type of polymer modification consists of an incorporation of functional groups which are bound to the principal chain. The peroxides or hydrogenperoxides obtained by ozonization may be important for the production of graft polymers. The authors studied the accumulation of functional hydrogenperoxide groups in atactic polypropylene by means of ozonization carried out quickly and at low temperature. After five-fold precipitation of polypropylene from isooctane by methanol it dissolved colorless in isooctane. Its intrinsic viscosity was 0.11 l/g (decaline, 25°C). To attain a quick oxidation the films were mounted on cylindrical glass frames. Atactic polypropylene dissolved in a mixture (1 : 1) of low-boiling benzine (boiling point 90°C) and isooctane was poured onto

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the water in the frame profile, and the solvents were evaporated. 32 mg ozone were formed per l oxygen in the ozonizer with 10,000 V and a flow rate of O_2 of 0.5 l/min. The peroxides were determined iodometrically, the viscosities in the capillary viscosimeter. Samples of different thickness were studied (Fig. 1) with the peroxide content depending on their thickness over the entire range. Later on, however, only 0.11 mm thick films were tested because of the required mechanical strength. Fig.2 shows the effect of ozone concentration on peroxide accumulation. Fig. 3 illustrates the peroxide oxygen accumulation between 0 - 60°C. Viscosity tests on ozonized samples in decaline indicate a partial destruction of the macromolecules. The samples were found to be incompletely soluble. Fig. 4 compares the intrinsic viscosities and the peroxide concentration during ozone and atmospheric oxidation. The content of insoluble components depends on time and temperature of ozonization. Ozone acts as an initiator. The increased reaction rate as compared with those of air or oxygen at low temperatures increases the difference between oxidation- and diffusion rate in the film. Surface and thickness considerably affect the rate of peroxide accumulation. As it is approximately proportional to the square root of the increase of the portions

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insoluble after ozonization, the latter represent the oxidation initiator. Their oxidation rate is higher from the beginning of the reaction. They are probably formed by cross linking of polymer chains by peroxide groups, hydrogen peroxides and polymeric peroxides which are formed particularly on the film surface. At a certain temperature a maximum concentration of peroxide oxygen cannot be exceeded at arbitrary oxidation time. (Fig.3). Contrary to atmospheric oxidation, it does not decrease in the case of ozonization, the peroxide decomposition rate being equal to the formation rate. This maximum concentration approximately corresponds to the peroxide concentration in the insoluble part of the film. A dynamic equilibrium is assumed to be present in the system because of the destruction of the macromolecules. At a larger sample thickness the maximum peroxide concentration is attained more slowly. A 10 % content of insoluble fractions corresponds to a surface layer of 0.005 mm in a 0.11 mm thick sample. As in this case the formation of insoluble fractions sets in at once at beginning ozonization, the maximum concentration in small samples is attained more rapidly. At higher oxidation temperatures (39°C, 56°C) the insoluble fractions decrease. Presumably hydrogenperoxides are formed at the expense

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of the formation of unstable peroxides at equal total amount of peroxide oxygen, as the latter are exposed to a higher thermal stress. After 1000 hr at room temperature the hydrogenperoxide content decreases by 20 %, all peroxides, however, are already decomposed. There are 5 figures and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The reference to the English-language publication reads as follows: Ref. 3: Natta, J. Polymer Sci., 34, 696, 1959.

ASSOCIATION: Chemical Institutes of the Slovakian AS, Bratislava

SUBMITTED: December 30, 1960

Card 4/8

23679

Z/043/61/000/003/001/001
D222/D305

15.8101

AUTHORS: Rado, Rudolf, and Lazar, Milan, Engineers

TITLE: Cross-linking of polyethylene initiated by benzoylperoxide (III) - Formation of cross links

PERIODICAL: Chemické zvesti, no. 3, 1961, 191 - 197

TEXT: This is a continuation of previous studies on cross-linking of polyethylene initiated by free radicals originating during thermal decomposition of benzoylperoxide (R. Rado, M. Lazar, Ref. 1: Chem. zvesti 15, 63 (1961); R. Rado, M. Lazar, Ref. 2: Chem. zvesti 15, 95 (1961)). This paper evaluates the chemism of polyethylene cross linking and expresses, in terms of formal kinetics, whose relations confirm the observed regularities. The decomposition mechanism of benzoylperoxide [Abstractor's note: In the following referred to as BP] is listed in the above references and the limited solubility in organic solvents of cross-linked polyethylene [Abstractor's note: In the following referred to as PE] was used for quantitative determination of the

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Z/043/61/000/003/001/001
D222/D305

Cross-linking of polyethylene...

cross-linking progress. The degree of cross-linking (γ) and the quantity of cross-links, obtained at various BP concentrations, after various periods, and at different temperatures, are tabulated. In analogy with polymer cross-linking initiated by ionizing and ultraviolet radiation, it is assumed that BP-initiated cross-linking also occurs by recombination of polymer radicals: $PE^{\bullet} + PE^{\bullet} \rightarrow PE\text{-}PE$. However, as distinct from the radiation-initiated cross-linking, there is no linear relation between the cross-link formation and the concentration of the initiator (BP). This is attributable to reactions which reduce the efficiency of the BP, i.e. induced decomposition and termination (recombination) between the BP radical and the polymer radical, thus competing with the cross-linking reaction itself. These inhibiting reactions have inverted temperature dependence: the non-effective BP consumption caused by induced decomposition drops, that caused by $R^{\bullet} + PE^{\bullet}$ recombination rises with increasing temperature. The kinetic equation for the cross-linking process can be derived as follows: The total amount of radicals ($PE^{\bullet}$ and $R^{\bullet}$), originating

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during a certain period is $2k_1 [BP] \Delta t$; the amount of PE• radicals is given by the amount of liberated benzoic acid (ΔRH); the amount of R• radicals is given by the difference of these two values. Since each primary radical which is not transferred to a polymer radical, consumes an equivalent amount of polymer radicals for its termination, the total amount of radicals lost by this termination is $2(2k_1 [BP] \Delta t - \Delta RH)$, and only the remaining amount of PE• radicals $2(\Delta RH - k_1 [BP] \Delta t)$ recombines and serves the formation cross-links. Since always two PE• radicals are required to form each cross-link, the total amount of originated cross-links is given by the difference $\Delta RH - k_1 [BP] \Delta t$. After substitution of the expression given for ΔRH in equation 7 (Ref. 2), the equation reads

$$\frac{d[PE - PE]}{dt} = (k_{pr}k_i - k_1)[BP]_t,$$

in which [PE - PE] is the concentration of produced cross-links,

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and $[BP]_t$ is the concentration of BP at the time t, which can be calculated by a similar formular as valid for spontaneous decomposition:

$$BP = \int_0^t \frac{[BP]_0 \cdot dt}{A(a+1) - a} = \frac{1}{k_i} \{2.303 \log [A(a + 1) - a] - k_1 t\}$$

in which $(k_{pr}k_i - k_1)$ is the portion of effective (spontaneous) peroxide decomposition, directly initiating the cross-linking. In the two most extreme cases, the velocity of cross-link formation will be either zero ($k_{pr}k_i = k_1$) or equal to the spontaneous BP decomposition ($k_{pr}k_i = 2k_1$). After substitution for the expression $[BP]_t$ and adjustment, results an equation

$$[PE - PE] = \left(k_{pr} - \frac{k_1}{k_i}\right) \{2.303 \log [A(a + 1) - a] - k_1 t\}$$

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Cross-linking of polyethylene...

which contains 3 known kinetic constants and expresses the quantity of cross-link formation depending on the initial BP concentration and the reaction time. The calculated values coincide well with experimental results. There are 2 figures, 2 tables and 12 references: 2 Soviet-bloc, and 10 non-Soviet-bloc. The references to the four most recent English-language publications read as follows: L.D. Moore: J. Polymer. Sci, 20, 94, 137-153 (1956); A. Charlesby: Radiation Research 2, 96-97 (1955); E.J. Lawton, J.S. Balwit, R.S. Powell: J. Polymer. Sci, 32, 125, 257-275 (1958); An., Brit. Plast. 31, 399 (1958).

ASSOCIATION: Výzkumný ústav káblov a izolantov v Bratislave (Research Institute for Cables and Insulators, Bratislava): Ústav dreva, celulózy a umelých vlákien Slovenskej akadémie vied v Bratislave (Institute for Wood, Cellulose and Artificial Fibers, Slovak AS, Bratislava).

SUBMITTED: March 8, 1960

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RADO, R.; LAZAR, M.

Peroxide-induced cross-linking in polyethylene. Vysokom. soed. 3 no.2:310-318 F '61. (MIRA 14:5)

1. Nauchno-issledovatel'skiy institut kabeley i izolyatsionnykh materialov i Khimicheskiy institut Slovatskoy akademii nauk, Bratislava.

(Polyethylene) (Benzoyl peroxide)

V

23169

Z/043/61/000/005/001/001
D217/D303

5.4300 1142, 1273, also 1372

AUTHOR: Lazár, Milan

TITLE: Grafting efficiency of organic polymers by chain transfer reactions

PERIODICAL: Chemické zvesti, no. 5, 1961, 327-332

TEXT: In the present work an equation is derived for grafting efficiency for chain transfers from the macro-molecules of the polymerizing monomer and initiator radicals onto the back bone polymer and monomer by considering the kinetic constants of the simultaneously occuring processes. In its final form the equation has the form

$$\dot{u} = 1 - \frac{K}{1+\alpha}(1 + d\alpha + r\alpha K), \qquad (5)$$

where K is equal to

$$K = \frac{\alpha(cPo + C_M M) + C_M M(1+\beta)}{(1+\alpha)(1+\beta)(CPo + C_M M)}$$

and α is the ratio of the rates of polymer radical disappearance due to their interaction and due to their reaction

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Grafting efficiency of...

with the backbone polymer and monomer and may be expressed as follows

$$\alpha = \frac{\delta^2 v_p}{CP_0 M + C_M M^2}, \qquad (6)$$

where $C = \frac{K4}{K2}$ - constant for the transfer onto the backbone polymer and $C_M = \frac{K_{4M}}{K_2}$ - constant for transfer onto the monomer and $\delta^2 = \frac{K^3}{K_2^2}$, the K's denoting velocity constants. The magnitude β expresses the ratio of the rate of reactions of the initiator radicals with the backbone polymer to the rate of their addition to the monomer present. From Eq. (5) it follows that the grafting efficiency is proportional to β and C and inversely proportional to α and C_M. From practical experience it can be said that grafting efficiency through chain transfer reactions is important for such backbone polymers, for which the rate of transfer from the macroradical onto the polymer is considerably higher than onto the monomer. Another important fact is that in evaluating the grafting efficiency

21876

15.8600 1372, 2209

Z/043/61/000/006/001/002
D229/D302

AUTHORS: Lazár, Milan, Engineer and Pavlinec, Jiří, Engineer, Candidate of Sciences

TITLE: Transfer reactions of the polymethylmethacrylate radical with some solvents

PERIODICAL: Chemické zvesti, no. 6, 1961, 428-434

TEXT: Polymerization processes are accompanied by transfer reactions which cause premature termination of the growth of macroradicals. These reactions are quantitatively characterized by transfer constants, the knowledge of which allows the polymerization degree to be predicted and to illuminate the mechanism of the transfer reaction. This paper investigates transfer constants of reactions taking place between the polymethylmethacrylate radical and the solvents n-heptane, isooctane (2,2,4-trimethylpentane) and esters of the acetic acid. The transfer constant is expressed by the change of the average polymerization degree $\bar{P}$ in dependence on the change of concentration of the transfer

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agent. The equation expressing this dependence for a polymerization system in which M is the monomer, S the solvent, and I the initiator, reads: $\frac{1}{\bar{P}} = C_M + C_s \frac{S}{\bar{M}} + C_i \frac{I}{\bar{M}} + \delta^2 \frac{R_2}{\bar{M}^2}$. The expression $C_M + C_i \frac{I}{\bar{M}} + \delta^2 \frac{R_2}{\bar{M}^2}$ will be replaced by the symbol X; magnitudes C_M, C_s and C_i are transfer constants for the pertinent agents, expressing the ratio of velocity constants of the transfer reaction to the velocity constant of the macroradical growth; δ^2 is the ratio of the velocity constant of the termination to the square of the velocity constant of the growth; and R is the polymerization rate. Values for $C_M = 0.6 \cdot 10^{-5}$ and for $\delta^2 = 141.5$ were taken from literature. To prepare pure methylmethacrylate for the tests, the stabilizer was extracted by gradual shaking with 10% solutions of NaOH, H_2SO_4, K_2CO_3 and distilled water, and by distillation of the monomer directly before starting the tests. The polymerization was performed in an 8 ml sealed glass ampoule in nitrogen atmosphere

at 50°C. It was carried on to a maximum conversion of 7.5% (only in the case of n-heptane, isooctane, and monomer concentration of less than 7,5 mol/l, the conversion exceeded 10%). The polymer was isolated by mixing the ampoule content with chloroform and precipitation with an excess of methanol. The flaky polymer precipitate was dried in vacuum. The average polymerization degree of the unfractionated polymer in chloroform solution was $\log \bar{P} = 4.24 + 1.257 \cdot \log [\eta]$. The intrinsic viscosity $[\eta]$ (expressed in $l \cdot gr^{-1}$) was determined by measuring the viscosity of the polymer solution at 25°C in an Ubbelohde viscosimeter with a flow-time of 304.8 sec for the pure solvent. Transfer constants of the methylmethacrylate - hydrocarbon reaction are difficult to determine due to the limited solubility of the polymer in non-polar solvents. At $\frac{S}{M}$ values greater than 0.2, anomalities originate in the course of the $\frac{1}{\bar{P}} - X$ function, and the transfer constant C_s can only be determined from the initial course of the function, where the trend is still positive. In this way, transfer constants $C_s = 1.8 \cdot 10^{-4}$ were obtained for n-heptane and $C_s = 1.2 \cdot 10^{-4}$ for isooctane. The

Transfer reactions of the...

change of the initial course of the polymerization function in non-polar solvents can visually be observed with the aid of polymer precipitation and the increase in the polymerization rate to approximately 4-times the block-polymerization rate, while the polymerization rate in other solvents remains equal. An increase of $\bar{P}$ and R by increasing the concentration of the solvent, is connected with a considerable decrease in the velocity constant k_t for termination. The influence of the solvent on the change of k_t can also be used at lower concentrations of the transfer agent, even when the polymer precipitation cannot be visually observed, and can influence the determination of C_s with other solvents than hydrocarbons. Experimentally obtained $\frac{1}{\bar{P}}$ values for higher $\frac{S}{\bar{M}}$ ratios are lower than those calculated by the function $\frac{1}{\bar{P}} - X = C_s \cdot \frac{S}{\bar{M}}$, an effect which could be observed for all solvents at $\frac{S}{\bar{M}}$ ratios nearing 1. Values for $\frac{1}{\bar{P}}$ at various $\frac{S}{\bar{M}}$ ratios and calculated transfer constants for

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Transfer reactions of the...

various solvents are listed in Table 1.

Table 1: Transfer constants C_s for methylmethacrylate polymerization in various solvents at 50°C and an initiator concentration of $2.06 \cdot 10^{-2}$ mol/l. (1) ethyl acetate, (2) n-propyl acetate, (3) isopropyl acetate, (4) n-butyl acetate, (5) isobutyl acetate, (6) secondary-butyl acetate, (7) tertiary-butyl acetate, (8) isooctane, (9) n-heptane. (a) graphically determined values, (b) constant $\frac{1}{\bar{M}} = 2.17 \cdot 10^{-3}$ moles/mol.

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Rozpúšťadlo	$\frac{S}{M}$	$\frac{1}{\overline{P}} \cdot 10^4$	$\left(\frac{1}{\overline{P}} - X\right) \cdot 10^4$	$C_s \cdot 10^4$
① etylacetát	0	2,36	0,06	0,8
	0,044	2,46	0,07	
	0,11	2,66	0,18	
	0,183	2,82	0,18	
	0,266	3,10	0,32	
	0,457	3,58	0,45	
	1,19	5,30	1,06	
② n-propylacetát	0	2,39	0,09	0,5
	0,035	2,44	0,05	
	0,093	2,57	0,09	
	0,161	2,80	0,16	
	1,02	4,88	0,55	
③ izopropylacetát	0	2,43	0,13	0,8
	0,092	2,52	0,04	
	0,151	2,76	0,12	
	0,220	2,87	0,09	

Table 1

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Transfer reactions of the ...

Table 1 cont'd.

		0,37 0,98	3,44 5,12	0,31 0,79	
④	n-butylacetát	0 0 0 0,003 0,02 0,032 0,046 0,056 0,091 0,158 0,191 0,2 0,24 0,283 0,355 0,447 0,563	2,30 2,32 2,33 2,305 2,348 2,378 2,335 2,378 2,482 2,570 2,635 2,585 2,695 2,818 2,925 2,830 3,035	— — — — — — — — — — — — — — — — —	1,3
⑤	izobutylacetát	0,03 0,08 0,134 0,194 0,335 0,80	2,59 2,71 2,80 2,94 3,4 4,03	0,20 0,23 0,25 0,16 0,27 0,60	0,5

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Transfer reactions of the ...

Table 1 cont'd.

Pokračovanie tab. 1

Rozpúšťadlo	$\frac{S}{M}$	$\frac{1}{\overline{P}} \cdot 10^4$	$\left(\frac{1}{\overline{P}} - X\right) \cdot 10^4$	$C_s \cdot 10^4$
⑥ *sek*-butylacetát	0 0,031 0,080 0,134 0,194 0,335 0,86	2,51 2,53 2,65 2,87 2,94 3,40 4,70	0,21 0,14 0,17 0,23 0,16 0,27 0,37	0,2
⑦ *terc*-butylacetát	0,03 0,08 0,191 0,320 0,840	2,41 2,53 2,99 3,35 4,78	0,02 0,05 0,21 0,22 0,45	0,5
⑧ izooktán[a])	—	—	—	1,2
⑨ *n*-heptán[a])	—	—	—	1,8

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Transfer reactions of the...

Applying the assumption made by M. Lazár, J. Pavlinec and Z. Maňásek (Ref. 5: Collection, v tlači (now printing)) that the resulting C_s is the sum of partial C_s values of individual groups in the molecule, partial constants for transfer to CH_3, CH_2 and CH groups obtain values of $0.05 \cdot 10^{-4}$, $0.3 \cdot 10^{-4}$ and $0.65 \cdot 10^{-4}$. The ratio of reactivities of these C-H bindings (0.1 : 1 : 4) and C_s values estimated according to the assumption made in Ref. 5; (Op. cit.) coincide well with actually measured values, considering that not very effective transfer agents of the polymethylmethacrylate chain are involved and that relative errors inherent in differential calculations are always rather large. In conclusion , the authors state that the anomaly observed in the dependence of the polymerization degree ($\bar{P}$) on changing ratios of solvent to monomer($\frac{S}{M}$), indicates a decrease of the termination constant due to the increasing solvent concentration. There are 2 figures, 1 table and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc.

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Transfer reactions of the... Z/043/61/000/006/001/002
D229/D302

ASSOCIATION: Ústav dreva, celulózy a chemických vlákien Slovenskej akadémie vied v Bratislave (Institute for Wood, Cellulosis and Chemical Fibers, Slovak AS, Bratislava).

SUBMITTED: July 4, 1961

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21877

15·8600 1372, 2209 Z/043/61/000/006/002/002
D229/D302

AUTHORS: Lazár, Milan, Engineer, Candidate of Sciences and Rado, Rudolf, Engineer

TITLE: Cross-linkage of saturated polymers by grafting

PERIODICAL: Chemické zvesti, no. 6, 1961, 435-440

TEXT: One of the possibilities for cross-linking polymers is grafting with a monomer. Cross-links produced by grafting have a different chemical composition from the linear chain. This paper deals with the theory and calculation of the polymerization degree of grafting, especially in view of transfer reactions. The expression for the ratio of cross-linked graft polymer to the total amount of grafted polymer can be derived from the reaction scheme for grafting, listed by M. Lazár (Ref. 2: Chem. zvesti 15, 327 (1961)). According to this reaction scheme, the growth of the branch chains is initiated by transfer reactions from both the growing macroradical (P.)and initiator radicals to the basic polymer (Po). To simplify the calculation, it is assumed

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that the first addition of the monomer to the polymer radical (Po.), the second addition, etc, have the same velocity constants. Cross--linkage by grafting occurs in the termination reaction, but only by recombination. Disproportionation and transfer reactions compete with the cross-linkage. The derivation of the proportion of cross-linked polymer (f_z) is also based on the assumption that the state of free-radical concentration in the system is stationary. (The concentration of radicals can be derived from the concentration of reacting components and the velocity constants of the pertinent reactions). The expression reads then:

$$f_z = \frac{rk_3 Po^{\cdot 2}}{k_2 Po \cdot Po + k_{2M} Po \cdot M + k_3 Po^{\cdot 2} + 2rk_3 Po \cdot P^{\cdot} + dk_3 Po \cdot P^{\cdot}},$$

in which r is the proportion of recombination; and d is the proportion of disproportionation in the termination [Abstracter's note: Other symbols not explained]. After introducing radical concentrations and adjustment, the function reads:

$$f_z = \frac{r(1 - K)\alpha}{1 + \alpha + r\alpha K},$$ in which the auxiliary

Cross-linkage of saturated...

symbol $K = \frac{\alpha(CPo + C_M M) + C_M M(1 + \beta)}{(1 + \alpha)(1 + \beta)(CPo + C_M M)}$; α is the ratio of extinction velocity of polymer radicals (Po. and P.) reacting with each other, to the velocity of polymer radicals reacting with the basic polymer (Po) and the monomer; C and C_M are transfer constants. Solved for α, the equation reads: $\alpha = \frac{\delta^2 v_p}{CPoM + C M^2}$, in which $\delta = \frac{k_3^{0.5}}{k_2}$; $C = \frac{k_4}{k_2}$; $C_M = \frac{k_{4M}}{k_2}$; v_p is the total velocity for monomer consumption; and β is the ratio of the velocity for initiator radicals reacting with the basic polymer to that for initiator radicals added to the monomer. The portion of the cross-linked graft polymer increases at higher ratios of recombination velocity to total termination velocity and lower values for K. Cross-linkage reaches a maximum at K = 0 and is zero at K = 1. The value for f_z also strongly depends on the value for α, since the cross-linkage requires the transfer which enables the origin

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of polymer radicals Po•; however, the transfer reaction itself competes with the recombination reaction, during which the cross-linkage takes place. The optimum value for α corresponds exactly to the maximum for f_z. The dependence of the f_z value on values for α and β is shown in Fig. 1.

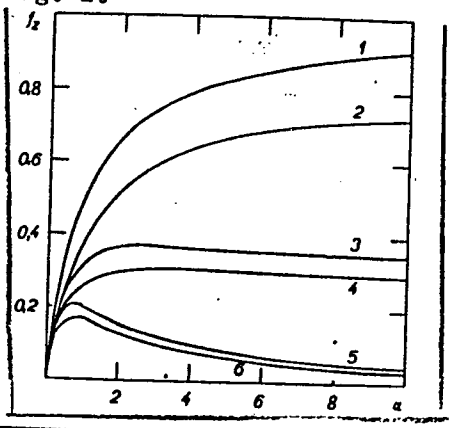

Fig. 1

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According to the present knowledge it can be expected that β values for most polymers will be rather low when initiated by low-molecular initiators. Higher β values can be obtained when the grafting is

performed with the aid of polymer hydroperoxides. Under the supposition that hydroperoxide groups are bound to the polymer to be grafted, that they are subject to monomolecular decomposition and that the HO• radical initiates homopolymerization, while the macroradical initiates directly the grafting of the branch chain, a value of $\beta = 1$ is obtained. Considering a different decomposition mechanism where no monomolecular radicals originate, obtained β values will be very high. As an example for cross-linkage, the authors quote the grafting of a hydrocarbon polymer with styrene. In respect to the prevailing recombination in the termination reaction, the cross-linkage of this monomer seems possible. However, when $\beta = 0$, cross-linkage will not take place, because for most grafted polymers, the α values will lie above 10.

Fig. 1. Course of the dependence of f_z on α under the assumption that the transfer to the monomer is negligible and that the recombination prevails in the termination reactions (r = 1, or 0.8 respectively), at $\beta = 100$ (lines 1 and 2); $\beta = 1$ (lines 3 and 4); and $\beta = 0$ (lines 5 and 6).

Cross-linkage of saturated...

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The grafting must therefore be performed with the aid of hydroperoxide. Under optimum conditions ($\beta = 1$), 30 - 35% of the total grafted molecules will be cross-linked. Since during the decomposition of the polymer hydroperoxide according to R - O - O - H $\longrightarrow$ RO· + R· + H_2O,

only polymer radicals originate, it should be expected that nearly all of the originating styrene-grafted polymers will be cross-linked. The experimental determination of the f_z value is more difficult than the determination of the cross-linking degree of saturated polymers with direct linkage of linear chains, since it requires the knowledge of the average polymerization degree of both the basic polymer and the cross chains. The difficulty lies in the fact that a cross-linked polymer does not start loosing its solubility before the average number of cross-links exceeds 1/4 of the original polymer chains. In conclusion, the authors state that the cross-linkage obtained by grafting depends, to a large extent, on three ratios, i.e. the ratio of

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Cross-linkage of saturated...

recombination to total termination; the ratio of the termination velocity to the sum of velocities of transfer reactions; the ratio of the velocity of the initiator-radical reaction with the basic polymer to the velocity of the initiator-radical addition to the monomer. There are 1 table, 1 figure, and 4 references: two Soviet-bloc and two non-Soviet-bloc. The references to English-language publications read as follows: T.G. Fox and S. Gratch, Ann. N.Y. Akad. Sci. 57, 367-383 (1953); A. Charlesby, Proc. Roy. Soc. A 222, 542-547.

ASSOCIATION: Ústav drava, celulózy a chemických vlákien Slovenskej akadémie vied v Bratislava (Institute for Wood, Cellulosis and Chemical Fibers, Slovak AS, Bratislava) (Lazár); Výzkumný ústav káblov a izolantov v Bratislave (Institute for Cables and Insulators, Bratislava)(Rado)

SUBMITTED: May 23, 1960

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S/190/61/003/007/018/021
B101/B230

AUTHORS: Maňásek, Z., Berek, D., Mičko, M., Lazár, M., Pavlinec, J.

TITLE: Formation and decomposition of hydroperoxides of atactic polypropylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 7, 1961, 1104 - 1109

TEXT: Reference is made to the fact that grafting of side chains and thus modification of polymers is possible by formation of macroradicals. Such macroradicals may be formed by decomposition of peroxides formed in the oxidation of polymers. The target of the present paper was therefore to study the conditions of the formation and decomposition of peroxides on the example of atactic polypropylene. Polypropylene was purified by repeated precipitation from an alcohol and isooctane solution by methanol and heating to 160°C in a nitrogen atmosphere. From a 3 % solution of polypropylene in isooctane, films 0.1 mm thick were produced on glass plates and oxidized by heating in air at 90 - 120°C. Determination of peroxides took place in nitrogen atmosphere. To the polymer dissolved in chloroform a saturated acetic acid KI solution was added.

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and the iodine released titrated with hyposulfite. The change in molecular weight caused by oxidation was determined viscosimetrically in a decalin solution. Decomposition of peroxides took place at 90 - 120°C in nitrogen atmosphere in sealed ampuls. A study of the oxidation showed that the same was depending on the diffusion of oxygen in the film, herewith on the thickness of the film. At rising temperature, oxidation was faster than the rate of diffusion of O_2 in the film. Optimum film thickness was found to be 0.1 mm. Fig. 2 shows the kinetic course of oxidation as a function of reaction time. For the initial phase of the reaction, the equation: $d[ROOH]/dt = [ROOH]$ (1) is put down, where φ is the autocatalytic factor, $[ROOH]$ is the concentration of peroxides determined experimentally after termination of time t. In the subsequent phases of oxidation φ is not constant any longer. The empirical equation: $[ROOH]_t = [\alpha/(\beta - \gamma)]\,[\exp(-\gamma t) - \exp(-\beta t)] + [ROOH]_{init}\exp(-\beta t)$ (5) is quoted. α, β, γ are constants. For 100°C, and assuming $\alpha = 1.078$, $\beta = 0.11$, $\gamma = 0.038$, $[ROOH]_{init} = 0.385$, the curve was calculated and drawn into Fig. 2 as a dash line. From the linear dependences log = f(1/T); log w = f(1/T),

where w is the rate of oxidation, the activation energy of the accumulation of peroxides in the polymer was calculated to be 24 - 25 kcal per mole. The induction period observed may be reduced or entirely eliminated by previous accumulation of peroxides, e. g., by treating the polymer with ozone. It was found that the intrinsic viscosity (and therefore also the molecular weight) decreases with increasing concentration of peroxides, regardless to temperature, following the same rules. Decomposition of the peroxides in inert atmosphere takes place as a reaction of second order (Fig. 5). Dependence $1/[ROOH] = f(T)$ is a linear function. Activation energy calculated from the constant of destruction rate amounts to 27 kcal per mole. The same value results from the function $\log (1/t_{max}) = f(1/T)$, where t_{max} is the time in which maximum concentration of peroxides is attained. V. B. Miller and M. B. Neyman are mentioned. There are 7 figures and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The reference to English-language publication reads as follows: G. Natta, E. Beati, F. Severini, J. Polymer Sci., 34, 685, 1959.

ASSOCIATION: Chemical Institutes of the Slovakian Academy of Sciences, Bratislava

[redacted], [redacted]

SURNAME, Given Names

Country: Czechoslovakia

Academic Degrees: Engr, C. Sc. /Candidate of Sciences/

Affiliation: Institute of Wood, Cellulose, and Chemical Fibers, SAV /Slovenska akademia ved; Slovak Academy of Sciences/ (Ustav dreva, celulozy a chemickych vlaken), Bratislava

Source: Bratislava, Nasa Veda, Vol,VIII, No 9, 1961, pp 536-539.

Data: "The Future Belongs to Plastics."

GPO 981643

PAVLINETS, I.; LAZAR, M.; MANYASEK, Z.

Chemical modification of polypropylene fibers brought about by grafting methyl methacrylate. Khim.volok. no.5:21-25 '62. (MIRA 15:11)

1. Khimicheskiy institut Slovatskoy Akademii nauk, Bratislava, Chekhoslovatskaya Sotsialisticheskaya Respublika.

(Textile fibers, Synthetic)
(Propene)
(Methacrylic acid)

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S/190/62/004/006/026/026
B110/B138

15.8620

AUTHORS: Lazar, M., Kliman, M.

TITLE: Polymerization of trifluoro-chloro-ethylene, initiated by γ-radiation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 948-952

TEXT: Radiation polymerization of trifluoro-chloro-ethylene was investigated (Co^{60}). It was found that the polymerization rate decreased with rising temperature. Polymerization was autocatalytic, since the yield of free radicals is higher during polymer than during monomer irradiation. Polymerization was carried out in the presence of hydroquinone, in order to establish the radical mechanism. Complete inhibition occurred. The apparently negative activation energy could, therefore, not be explained by ion mechanism. A polymerization already in course is retarded by the temperature rise and takes the same course as one which starts at increased temperature. Once again an induction period appears, which is five to

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Polymerization of trifluoro ...

eight times higher at 50°C. This confirms that the monomer radicals formed on chain transfer participate in chain rupture. The activation energy of the monomer transfer is reckoned as 4-7 kcal/mole higher than that of growth. In the presence of pentachloro-ethane, the activation energy is positive, as sufficiently reactive radicals develop during transfer for reinitiation, and monomer radicals are removed from the system by transfer. For the logarithmic dependence of the polymerization rate on radiation dose, the degree n ($v=kI^n$) is higher at higher temperatures. This is due to variation in the participation of the individual partial reactions (destructive transfer on the monomer). Increase of the index from 0.5 to 1 during radical polymerization is explained by: (1) destructive transfer on the monomer or (2) by reaction of primary radicals with the macro-radicals of growth. (1) holds with temperature rise. Since with a certain minimum dose "normal" ratios are obtained between polymerization rate and heat of reaction, the activation energy of polymerization must depend closely on the dose rate. There are 5 figures.

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B110/B138

Polymerization of trifluoro ...

ASSOCIATION: Khimicheskiye instituty Slovatskoy Akademii nauk, Bratislava (Chemical Institutes of the Slovak Academy of Sciences, Bratislava). Nauchno-issledovatel'skiy institut kabeley i izolyatsionnykh materialov, Bratislava (Scientific Research Institute for Cables and Insulating Material, Bratislava)

SUBMITTED: October 31, 1961

Card 3/3

ROMANOV, A.; LAZAR, M.

Preparation and identification of a graft copolymer "atactic polypropylene-polystyrene". Vysokom. soed. 4 no.12:1867-1871 D '62. (MIRA 15:12)

1. Khimicheskiy institut Slovatskoy akademii nauk, Bratislava.
(Styrene polymers)
(Propene)

BELLUSH, D. [Bellus, D.]; MANYASEK, Z. [Manasek, Z.]; LAZAR, M.

Chlorophosphorylated atactic polypropylene. Vysokom.soed. 5 no.1:145-150 Ja '62. (MIRA 16:1)

1. Khimicheskiy institut Slovatskoy Akademii nauk, Bratislava.
(Propene) (Phosphorodichloridic acid) (Polymers)

MANYASEK, Z.[Manasek, Z.]; MICHKO, M.[Micko, M.]; PAVLINETS, Y. [Pavlinec, J.]; LAZAR, M.

Modification of polypropylene fibers by the grafting of acrylonitrile. Khim. volok. no.3:20-24 '63. (MIRA 16:7)

1. Institut drevesiny, tsellyulozy i khimicheskikh volokon Slovatskoy Akademii nauk, Bratislava, Chekhoslovatskaya Sotsialisticheskaya Respublika.
(Textile fibers, Synthetic)
(Polypropylene) (Acrylonitrile)

PAVLINETS, Yu. [Pavlinec, J.]; LAZAR, M.; MANYASEK, Z. [Manasek, Z.]

Grafting of polyglycol methacrylate into propylene fibers. Khim. volok. no.4:74-77 '64. (MIRA 18:4)

1. Laboratoriya polimerov Slovatskoy Akademii nauk, Bratislava.

RADO, R.; SZOCS, F.; LAZAR, M.

Disapperance of macroradicals in peroxide initiated transformations of hard polymers. Coll Cz Chem 30 no.3:894-897 Mr '65.

1. Forschungsinstitut fur Kabel und Isolierstoffe und Laboratorium der Polymere, Slowakische Akademie der Wissenchaften, Bratislava. Submitted November 15, 1962.

L 3515-66 EPA(s)-2/EWT(m)/EPF(c)/EPA(w)-2/EWP(j)/EWP(t)/EWP(b)/EWA(c) IJP(c)/RPL
JD/WW/JW/JWD/RM

AM5018508 BOOK EXPLOITATION UR/ 621.315.616.9

Lazar, Milan; Rado, Rudolf; Kliman, Norbert

Fluorocarbon plastics (Ftoroplasty). Moscow, Izd-vo "Energiya," 1965. 303 p. illus., biblio. 3300 copies printed. Translation of Fluoruhlikove plasticke latky. Bratislava, SVTL, 1960.

TOPIC TAGS: copolymer, fluorocarbon plastic, fluorocarbon polymer, polyfluoroethylene resin, polymerization technology, polymer property, polytetrafluoroethylene, polytrifluorochloroethylene

PURPOSE AND COVERAGE: This book is intended for personnel in industries producing plastics and electrical insulation. The authors present the physical and chemical background of various fluorocarbon plastics, discuss raw materials, polymerization technology, polymer properties, and describe the use of manufacturing equipment and efficient production methods in this field. They thank engineers V. Reinhohl and F. Tomis. Many references, mainly Western, accompany most of the chapters.

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