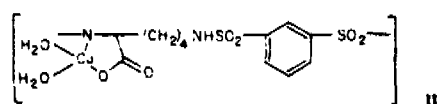


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Kagaku (Kyoto) 1972, 27(2), 131-9 (Japan). A discussion on conformational anal. of polymers. K. Yamaguchi

160263b Influence of the method of removing the unstable ion and of the modification with polyethylene oxide) on decomposition of trioxane-dioxolane copolymers at elevated temperatures in air. Fejrm, J. (Inst. Ind. Chem., Warsaw, Pol.). *Rocz. Chem.* 1972, 46(9), 1593-12 (Pol.). Trioxane-dioxolane copolymer (I) [24969-26-4] contg. 5% dioxolane and I optionally modified with 2% polyethylene oxide) [25322-68-3] were decompd. at 140-60°. Unstable I fractions were removed before decompn. by 3 methods: by heating at 150° in PhCH₃OH soln. with addn. of 1% triethanolamine, by heating a suspension of I in 5% KOH, or by heating I under pressure in a H₂O-PhCH₃OH-triethanolamine mixt. at 150°. The first (homogeneous) method was the most efficient, since no decompn. occurred at 140 or 150°, although decompn. was accelerated at 160°. Polyether fragments in modified I diminished its thermal stability. W. Gustowski

160264c Optically active polysulfonamides. Synthesis of the polycondensate of L-lysine and 1,3-benzenedisulfonyl chloride. Polyelectrolytic properties. Chelation of copper(II) ions. Beaumais, J.; Fenyó, J. C.; Selegny, E. (Lab. Chim. Macromol., Univ. Rouen, Mont-Saint-Aignan, Fr.). *Eur. Polym. J.* 1973, 9(1), 15-26 (Fr.). 1,3-Benzenedisulfonyl



chloride-L-lysine ethyl ester copolymer [39534-61-7] was prepd. by interfacial polycond. and hydrolyzed to 1,3-benzenedisulfonyl chloride-L-lysine copolymer (I) [39534-62-8]. I was shown by viscometry to be a polyelectrolyte, and its ionization const. as a polymeric dibasic acid were calcd. I formed a Cu chelate, assumed by analogy with monomeric chelates to have the structure II, the potentiometric and spectral properties of which were detd.

160265d Alkaline hydrolysis of copolymers of vinyl acetate and acrylic esters bearing ether groups in their structure. Camo, J. M.; Arranz, F. (Inst. Plast. Caucho, Madrid, Spain). *Rev. Plast. Mod.* 1972, 24(197), 749-56 (Span). The hydrolysis rate of poly(vinyl acetate) (I) [9003-20-7] was reduced by copolymer with ethylene glycol monoethyl ether acrylates and the const. for glycol initiation of hydrolysis (K_1) was increased except in cases where a low water concn. in the hydrolysis medium permitted localized concn. of NaOH. I and vinyl acetate copolymer with 10, 20, and 30% ethylene glycol monoethyl ether acrylate (II) [106-74-1], diethylene glycol monoethyl ether acrylate [7328-17-8] and triethylene glycol monoethyl ether acrylate [39670-09-2] were hydrolyzed with NaOH at 25° in 85:15 and 70:30 acetone-water mixts. In the system contg. 15% H₂O the hydrolysis rate was substantially reduced only for the II-contg. polymer but K_1 increased with increasing acrylate monomer concn. for all polymers. In the system contg. 30% H₂O the stability to hydrolysis increased for all the copolymers in comparison with I.

160266e Thermal stability of PVC obtained in o-dichlorobenzene by a radical route. Lopez Madruga, B. E.; Carcamo, J. M. (Sec. Quim. Macromol., Inst. Plast. Caucho, Madrid, Spain). *Rev. Plast. Mod.* 1972, 24(197), 771-5 (Span). The rate of dehydrochlorination of poly(vinyl chloride) [9002-85-2] was inversely proportional to the mol. wt. for samples with the same degree of stereoregularity. Vinyl chloride was polymerized at 3-6 mole/l. concn. in o-dichlorobenzene in the presence of 3×10^{-2} mole/1000 2,2'-azobisisobutyronitrile. At 30° PVC samples of mol. wt. 104,000-160,000 were obtained and at 50° the mol. wt. range was 62,000 to 89,000. The dehydrochlorination rate decreased with increasing mol. wt. through both ranges at 170 and 180°.

160267f Dynamic thermogravimetric analysis of polystyrene. Effect of molecular weight on thermal decomposition. Kotta, B. V.; Valade, J. L.; Martin, W. N. (Dep. Ing. Univ. Quebec, Trois-Rivières, Que.). *J. Appl. Polym. Sci.* 1973, 17(1), 1-19 (Eng). Dynamic thermogravimetric anal. of polystyrene (I) [5003-53-6] showed that the max. rate, the av. specific rate and the activation energy of thermal decompn. increase up to mol. wt. of 200,000 and then level off. The activation energy for the first part of the decompn. was 35 ± 5 kcal/mole and for the second part was 50 ± 5 kcal/mole. Overall activation energy of decompn. of I was 42 ± 5 kcal/mole.

160268g Degradation of poly(vinyl chloride). II. Oxidative degradation in solution. Herson, J. H. L.; Hybart, F. J. (Dep. Chem., Univ. Aston, Birmingham, Engl.). *J. Appl. Polym. Sci.* 1973, 17(1), 129-36 (Eng). The rate of oxidative degradn. of PVC [9002-85-2] soln. in PhPO₃ depended on the partial pressure of O₂ and was not decreased by phenol, quinone, and amine antioxidants.

160269h Effect of electrodeless glow discharge on polymers. Yasuda, H.; Lamaze, C. E.; Sakaoku, K. (Camille Dreyfus Lab., Res. Triangle Inst., Research Triangle Park, N. C.). *J. Appl. Polym. Sci.* 1973, 17(1), 137-52 (Eng). Gas plasma from electrodeless glow discharge caused predominantly degradn. in polymers, leading to exposure-area and -time dependent wt. loss. Crosslinking, except in polymers contg. double bonds, was negligible. Both degradn. and crosslinking by gas plasma were generally limited to the exposed surface, but for butadiene-styrene copolymers [9003-55-8] the crosslinking propagated in the direction of the thickness. Discharge power and type of gas greatly influenced both the rate of wt. loss and the morphol. of the exposed surface. Polymers contg. ether, CO and OH groups, particularly attached to aliph. chains, had high plasma susceptibility.

160270b Study of radiation-induced grafting by differential scanning calorimetry. Kamel, Ihab; Kusy, R. P.; Corneilussen, R. D. (Dep. Metall. Eng., Drexel Univ., Philadelphia, Pa.). *Macromolecules* 1973, 6(1), 53-8 (Eng). γ -irradn. grafting of styrene [100-42-5] onto low-density polyethylene [9002-38-4] film lowered both the melting point and heat of fusion during the first differential scanning calorimetry (DSC) detn. In later DSC detns. the melting point depression was constant, while the heat of fusion increased to the original value, and became graft independent; thus the heat of fusion detd. in the 2nd DSC run was used in apparent graft calcs. The lower heat of fusion obsd. in the DSC run was due to graft-induced strain on the crystal surface, later relieved by melting and recrystn. The 1st heat of fusion detd. and the degree of covalent grafting correlated.

160271c Cleavage of poly(vinyl alcohol) in the presence of cobalt(II) and -(III) and tert-butyl hydroperoxide in dimethyl sulfoxide and water solutions. Auerbach, A.; Jochsberger, T.; Indictor, N. (Brooklyn Coll., City Univ. New York, Brooklyn, N. Y.). *Macromolecules* 1973, 6(1), 143-5 (Eng). The rate of Co acetylacetonate induced decompn. of tert-butyl hydroperoxide [75-91-2] was similar in Me₂SO and H₂O systems; cleavage did not depend on peroxide decompn. An NMR contact shift, due to a paramagnetic cobalt(II) acetylacetonate-poly(vinyl alc.) complex was not obsd. on addn. of water traces to Me₂SO solns. Cobalt(II) acetylacetonate [14024-48-7] increased the polymer decompn. rate more than cobalt(III) acetylacetonate [21679-46-9] in both water and Me₂SO.

160272d Characterization of chain conformation and thermodynamics of extremely high-molecular weight polystyrenes. Slagowski, Eugene L. (Univ. Akron, Akron, Ohio). 1972, 303 pp. (Eng). Avail. Univ. Microfilms, Ann Arbor, Mich., Order No. 73-7693. From Diss. Abstr. Int. B 1973, 33(9), 4227.

160273e Calorimetric studies of bulk polymers. Beatty, Charles Lee (Univ. Massachusetts, Amherst, Mass.). 1972, 235 pp. (Eng). Avail. Univ. Microfilms, Ann Arbor, Mich., Order No. 73-5526. From Diss. Abstr. Int. B 1973, 33(9), 4225-6.

160274f Initial steps of the thermal degradation of poly(vinyl chloride). Guyot, A.; Bert, M. (Inst. Rech. Catal., CNRS, Lyon/Villeurbanne, Fr.). *Polym. Prepr., Amer. Chem. Soc., Div. Polym. Chem.* 1971, 12(2), 303-12 (Eng). Preliminary studies of the initial steps in the thermal degradn. of PVC [9002-86-2], using sensitive HCl measurements, indicated linear dehydrochlorination at temps. below 120° and an initial acceleration followed by a constant rate for higher temps. The activation energy for the process was 22 kcal/mole.

160275g Mechanisms for the thermal decomposition of polyethylene. Bailey, William John; Baccet, Louis J. (Dep. Chem., Univ. Maryland, College Park, Md.). *Polym. Prepr., Amer. Chem. Soc., Div. Polym. Chem.* 1971, 12(2), 313-18 (Eng). The products from the thermal decompn. of a 1:1 polyethylene [9002-88-4]-poly(tetradecutemoethylene) [25349-98-8] mixt. at 420, 520, and 620° indicated that ethylene, propane and butadiene were formed by intramol. mechanisms, that 1-butene, butane, and pentane were formed by intermol. mechanism, and that propylene and 1-pentene were by a combination of intermol. and intramol. mechanisms.

160276h Mechanism of polyethylene photodegradation. Oxidation of terminal olefins and saturated centers with singlet oxygen. Kaplan, M. L.; Kelleher, P. G. (Bell Lab., Murray Hill, N. J.). *Polym. Prepr., Amer. Chem. Soc., Div. Polym. Chem.* 1971, 12(2), 319-22 (Eng). Tetracosane (I) [646-31-1] and 1-docosene (II) [1399-67-3], as model compds. for polyethylene (III) [9002-88-4], were oxidized and excited with mol. O to elucidate the early stages of the photodegradn. of III. The hydroperoxide content of I and II after oxidn. were 0.003 and 0.7%. The presence of OOH in I indicated that singlet O could insert into a CH bond or abstract a H.

160277i Elucidation of coordination polymer stoichiometry via thermometric titrimetry. Metal complexes of triethoxyanionic acid. Beezer, A. E.; Chudy, J. C. (Chesapeake Coll., Univ. London, London, Engl.). *Thermochimica Acta* 1973, 6(2), 231-7 (Eng). The stoichiometry of coordination polymers formed by triethoxyanionic acid (I) [2060-82-4] with metals in DMF and aq. solns., detd. using thermometric titrimetry, varied from

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