〔Heterocycles, **32**, 1705-1707 (1991)〕 [Lab. of Pharm. Synthetic Chemistry]

A Total Synthesis of (−)-Physostigmine.

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A total synthesis of (−)-physostigmine was accomplished from (*S*)-1,3-dimethyl-3-(2-nitro-1-cyclohexen-1-yl)-2-pyrrolidinone.

〔J. Phys. Chem., **95**, 2398-2403 (1991)〕 [Lab. of Pharm. Physical Chemistry]

Electron Spin Resonance Study of Free-Radical Formation and Its Decay of Plasma-Irradiated Poly (methacrylic acid) and Its Esters.

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The room temperature ESR spectra of the radicals in four kinds of plasma-irradiated methacrylic polymers (acrylic resins), poly (methacrylic acid) (PMAA), its methyl ester (PMMA), and two types of their copolymers, were first studied. It was found with the aid of systematic computer simulations that all the spectra were outlines of multicomponent spectra, composed of nine-line spectrum (I), doublet (II), seven-line spectrum (III), and broad singlet-like spectrum (IV). These component spectra were assigned to the terminating radical (1), midchain radical (2), monomer-derived radical (3), and immobilized dangling bond sites (4), respectively.

〔J. Polym. Sci., Part A: Polym. Chem., **29**, 1-7 (1991)〕 [Lab. of Pharm. Physical Chemistry]

Electron Spin Resonance Studies of Plasma-Induced Polystyrene Radicals.

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Plasma-induced Polystyrene radicals were first studied by electron spin resonance (ESR). The room temperature ESR spectrum was composed with those obtained by γ-irradiation, UV-irradiation, and mechanical fracture. It was found that the ESR spectrum consisted of two types of spectra, a triplet and a single broad line. It was assigned to the structure of a cyclohexadienyl-type radical formed by a nearly random addition of a hydrogen atom to the aromatic ring. The single broad line, thought to be an outline of multicomponent spectrum, was assigned to an immobilized dangling bond site at the plasma-induced crosslinked portion of the polystyrene surface.