[Chem. Pharm. Bull., **43**, 2037-2041 (1995)] [Lab. of Pharm. Physical Chemistry]

Spectrochemistry of Plasma-Induced Free Radicals in Cellulose Derivatives.

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We report here the specific features of plasma-induced free radicals of cellulose derivatives such as ethylcellulose (EC) and hydroxyethylcellulose (HEC) on its comparison with those of cellulose. The electron spin resonance (ESR) spectra of Ar plasma-irradiated EC and HEC consist of three kinds of discrete spectral components. The results suggest that plasma-induced cross-linking reactions are very predominant in EC and HEC relative to that of cellulose, due to the presence of alkyl substituents in EC and HEC.

[Chem. Pharm. Bull., **43**, 2215-2220 (1995)] [Lab. of Pharm. Physical Chemistry]

A New Drug Delivery System Using Plasma-Irradiated Pharmaceutical Aids. V. Controlled Release of Theophylline from Plasma-Irradiated Double-Compressed Tablet Composed of a Wall Material Containing Polybenzylmethacrylate.

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A controlled-release tablet was obtained by oxygen plasma irradiation on the outer layer of double-compressed tablets prepared from theophylline as a core material and a copolymer of methylmethacrylate (MMA) and benzylmethacrylate (BzMA) as a single wall material. It was shown that the dissolution profiles can be varied so as to cause release of theophylline at different rates, depending on the set of conditions chosen for tablet manufacture and for plasma operation.

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A Novel Method for Introduction of Plasma-Induced Hydrophilicity on Polyethylene-Naphthalate

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We have examined a novel method to introduce durable wettability on the polymer surface, which involves a plasma-driven immobilization of precursor of hydrophilic polymer onto a hydrophobic polymer surface followed by hydrolysis of the precursor to generate hydrophilic groups. The water contact angle of plasma-irradiated PEN films containing GANTREZ soaked was periodically measured by a drop-on-plate method (5 μ l) to examine a durability of acquired wettability of the PEN surface. It was shown that the contact angles remain constant at the level of much lower values for a long period of time on standing in water.