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A New Drug Delivery System Using Plasma-Irradiated Pharmaceutical Aids. VII. Controlled Release of Theophylline from Plasma-Irradiated Polymer-Coated Granules.

MASANAO ISHIKAWA, KOTARO HATTORI, SHIN-ICHI KONDO, MASAYUKI KUZUYA*

We studied the theophylline release property from plasma-irradiated polymer-coated granules, the polymers of which differ in the plasma irradiation effect. It was shown that an increase in theophylline release rate with an increase in plasma duration was observed in all polymer-coated granules as evidenced by the SEM observations. Such results provided the criteria for selecting polymer structures for granule coating. Thus, the present method for the control of drug release is considered principally applicable not only to polymer-coated granules but also to various drug forms under consideration of the above criteria.

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Effect of Alkyl Substituent on Plasma-Induced Freee Radicals of Cellulose Derivatives.

MASAYUKI KUZUYA*, YUKINORI YAMAUCHI, JUNJI NIWA, SHIN-ICHI KONDO

Plasma-irradiation on hydroxypropylcellulose (HPC), low substituted HPC (L-HPC) and high substituted HPC (H-HPC), gives electron spin resonance (ESR) spectra considerably different from that of cellulose. The simulated spectra disclosed that the observed spectra consist of five kinds of discrete spectral components, two isotropic spectra [doublets (I) and triplets (II)], both being assigned to hydroxylalkyl radicals and two anisotropic spectra [doublet of doublets (IV) and doublets (V)], assigned to an acylalkyl radical, and a single line spectrum (III), assigned to an immobilized dangling-bond site (DBS) at the surface cross-linked region. One of the special features in H-HPC is the fact that the spectrum (III) is a major component contrary to cellulose.

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Hydrogen-bonding Interaction-assisted Micellar Electrokinetic Chromatography Using Mixed Surfactant Systems.

YUKIHIRO ESAKA*, MIKIO KOBAYASHI, TOKUJI IKEDA, KENJI KANO

Micellar electrokinetic chromatography (MEKC) has been examined using mixed surfactant systems consisting of Brij 35 or Tween 20, non-ionic surfactants with the polyether structure, together with sodium dodecyl sulfate (SDS). Addition of the non-ionic surfactant into SDS micellar system provides selective increase in the relative capacity factors of some substituted benzenes having hydrogen-donating substituents such as hydroxyl, amino, and amide group. This effect can be ascribed to the hydrogen-bonding formation between these solutes and the polyether segments of the non-ionic surfactant. The separation selectively can be well controlled by the mixing ratio of two surfactants. The thermodynamic aspect of the mixed micellar systems are discussed in detail.