Preparation and biocompatibility of poly(urethane-urea) containing phosphorylcholine moiety

by

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Abstract

In order to improve the biocompatibility of segmented polyurethane which has been widely used as a biomedical material, the synthesis of poly(urethane-urea) containing phosphorylcholine (PC) moiety was carried out using an aromatic diamine compound with a PC unit as a monomer. The obtained poly(urethane-urea) was soluble in aprotic polar solvents such as *N*-methylpyrrolidinone (NMP), *N,N*-dimethylformamide (DMF) and dimethylsulfoxide (DMSO), but insoluble in water, alcohols and acetone. Water-contact-angle analysis showed that these polymers with high PC content rearranged themselves to minimize their interfacial tension after coming into contact with an aqueous environment, where the concentration of PC units increased on the surface of polymer films. In addition, it was confirmed from the results of blood contacting experiments that the polymer exhibited the excellent biocompatibility, even though the PC content was approximately 10 mol%, as compared with polyurethane without PC units.

Keywords: Biocompatibility, Segmented polyurethane, Phospholipid polymer, Phosphorylcholine, Poly(urethane-urea).

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