



Enhancement of Hydrophilic Drug Loading and Release Characteristics through Micellization with New Carboxymethyldextran-PEG Block Copolymers of Tunable Charge Density

Ghareb Mohamed Soliman, Françoise M. Winnik

Abstract:

The micellization of a model cationic drug, diminazene diacetate (DIM) and a series of new diblock copolymers, carboxymethyldextranpoly(ethylene glycols) (CMD-PEG), were evaluated as a function of the ionic charge density or degree of substitution (DS) of the carboxymethyldextran block and the molar ratio, $[+]/[-]$, of positive charges provided by the drug to negative charges provided by CMD-PEG. Micelles ($[+]/[-] = 2$) incorporated up to 64% (w/w) DIM and ranged in hydrodynamic radius (RH) from 36 to 50 nm, depending on the molecular weight and DS of CMD-PEG. The critical association concentration (CAC) was on the order of 15-50 mg/L for CMD-PEG of DS > 60%, and ca. 100 mg/L for CMD-PEG of DS ~30%. The micelles were stable upon storage in solution for up to 2 months and after freeze-drying in the presence of trehalose. They remained intact within the 4

Published In:

International Journal of Pharmaceutics, doi:10.1016/j.ijpharm.2007.12.029 , Vol. 356 , pp. 248-258