

Core-shell(Poly(D,L-lactide-co-glycolide)/(Ethyl 2-cyanoacrylate)) structured microsphere for sustained drug delivery

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Monodispersed core-shell structured microcapsules by a Shirasu porous glass (SPG) membrane emulsification technique were prepared to reduce the initial burst release. Solution mixtures with different ratio of Poly(D,L-lactide-co-glycolide) (PLGA) polymers, ethyl 2-cyanoacrylate (E2CA) monomers and Doxorubicin were permeated through the SPG membrane with 1.9 μ m pore size into continuous water phase with sodium lauryl sulfate as surfactant by applying a pressure. Anionic interfacial polymerization of E2CA was started at the O/W interface by OH⁻ initiation. The prepared microcapsules were monodisperse and from 1.4 μ m to 1.9 μ m particle size. The morphology and core-shell structure of microcapsules were investigated by a field emission scanning electron microscope (FE-SEM) and transmission electron microscopy (TEM). Our study provided precedented control of microsphere size and might allow development of advanced controlled-release delivery systems. PLGA/E2CA mass ratio of 50:50 was found to be the optimal ratio giving the best release rate.