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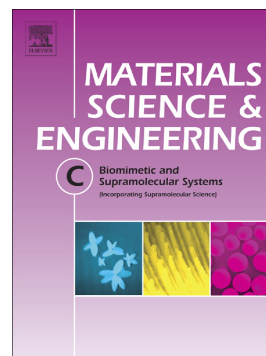
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Sodium alginate–Polyvinyl alcohol–Bovinserrumalbumin coated Fe₃O₄ nanoparticles as anticancer drug delivery vehicle: Doxorubicin loading and in vitro release study and cytotoxicity toHepG2 and L02 cells

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Abstract

The challenging part of this work was to research the potential aspects of sodium alginate (SA)–polyvinyl alcohol (PVA)–bovin serum albumin (BSA) coated Fe₃O₄ nanoparticles (Fe₃O₄-SA-PVA-BSA) as a drug delivery system for doxorubicin (DOX). The anticancer drug doxorubicin was selected as a model drug which is powerful for numerous cancer treatments. Superparamagnetic Fe₃O₄ nanoparticles were prepared by co-precipitation method. The mixture solution of Fe₃O₄-sodium alginate (SA) - doxorubicin (DOX) was crosslinked with Ca²⁺ to form (Fe₃O₄-SA-DOX) nanoparticles and addition of PVA and BSA with (Fe₃O₄-SA-DOX) nanoparticles were prepared by coating procedure. Doxorubicin drug loaded NPs were prepared by a simple crosslinking method by calcium chloride solution. The prepared polymer coated magnetic nanoparticles (Fe₃O₄-SA-PVA-BSA) were characterized by using SEM, AFM, FT-IR, XRD and VSM. The mean sizes of the obtained drug loaded nanoparticles (Fe₃O₄-SA-DOX, Fe₃O₄-SA-DOX-PVA and Fe₃O₄-SA-DOX-PVA-BSA) were between 240± 8.3 and 460± 8.7 nm and zeta potential of the particles also was evaluated using Malvern Zetasizer which ranged between -48.1 ± 2.3 and -22.4 ± 4.1mV. The encapsulation efficiency, was between 36.2 ± 0.01

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