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Gelatin-sodiun alginate polyelectrolyte complex smart porous microparticles for drug delivery application

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Microencapsulation technology as a prominent multidisciplinary area has its wide impact in many fields including pharmaceutical, agriculture, biotechnology, cosmetic, food and flavour industry. Thereby, the dimensions cover the range from millimetres to submicrometer scale, and the functionality ranges from simple storage devices to intelligent systems responding reproducibly to the environment. Porous microparticles of different sizes were prepared by polyelectrolyte complexation of biopolymers gelatine A and sodium alginate. The ratio of gelatin-A and sodium alginate and pH was optimised to get maximum yield of complex microparticles. The optimum pH and ratio between the polymers sodium alginate and gelatine A for maximum complexation was found as 3.7 and 1:3.5 respectively. Effect of various factors like amount of surfactant, concentration of polymer and crosslinker on the formation, size and porosity of the microparticles were investigated. These microparticles were used as carrier for ascorbic acid. The loading of ascorbic acid in microparticles were found to be dependent on the amount of crosslinker used, concentration of ascorbic acid and time of immersion. Release rate of ascorbic acid was dependent on pH and amount of crosslinker used. Swelling was more at pH 7.4 compared to that of at pH 1.2. The microparticles were found pH responsive. The surface morphology and sizes of the microparicles were investigated by scanning electron microscope. The microparticles were further characterized by FTIR, TGA, DSC and X-ray diffraction study. These pH responsive microparticles promise great potential for future at the interface of chemistry, biology and material science for biomedical applications.

Biography

Nirmala Devi has completed her Ph.D. from Tezpur University, Tezpur, Assam, India. She is currently doing her postdoctoral research as UGC Dr. D.S.Kothari Postdoctoral Fellow in the Department of Chemistry, Gauhati University, Assam, India. She has published more than 10 papers in reputed international journals. She is the achiever of National Award for Technology Innovation, Government of India.