MERCAPTOPROPYL FUNCTIONALIZED MESOPOROUS SILICA AS CARRIERS FOR CLOTRIMAZOLE

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Abstract

Mesoporous silica particles were synthesized by sol-gel method in order to be tested for their drug loading and release properties, starting from mixed silica precursors, tetraethoxysilane and mercaptopropyltriethoxysilane using the co-condensation method. The carriers demonstrated enhanced drug loading capacity of 99.87% and also showed good results in drug delivery. The cumulative percent of drug release in acidic buffered solution was 45.07% after 3 hours of release. The in vitro release data were applied to various kinetics models to predict the drug release mechanism and kinetics. A good coefficient of determination was obtained for Higuchi model. The drug release mechanism in acidic obeyed the Fickian diffusion mechanism. Considering the material characterisation N_2 adsorption-desorption isotherms were determined by N_2-physisorption measurements at 77 K for simple material as well for the material after functionalization with mercaptopropyl. After functionalization, the specific surface area decreases from 1213 m^2/g to 69.34 m^2/g and the pore diameter, from 3.54 to 2.4 nm but the total pore volume increases slightly from 0.8 to 1.05 cm^3.

References

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