

Role of surface charge of mesoporous silica particles in drug delivery

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We investigate the role of surface charge mesoporous silica particles in drug delivery. First, we prepare MCM-41 type mesoporous silica particles and control their surface charge through functionalization with organosilanes that have different functional groups. We use quasi-elastic light scattering (QELS), scanning electron microscopy (SEM), transmission electron microscopy (TEM), nitrogen sorption, and zeta potential measurements to characterize the synthesized particles. To use these particles as drug carrier for oral administration, ibuprofen is chosen as a model drug and ibuprofen loading and release characteristics of the particles with different surface charge are compared. These results suggest that electrostatic interaction between drug and particle surface plays an important role in drug loading and delivery.