Supplementary Document

1.MCM41 characterization

Fig 1S illustrates a typical SEM image of mesoporous silica particles (MCM-41) prepared. It can obviously be seen that the MCM-41 silica has a uniform spherical morphology. These particles exhibit diameters ranging between 225 and 425 nm .

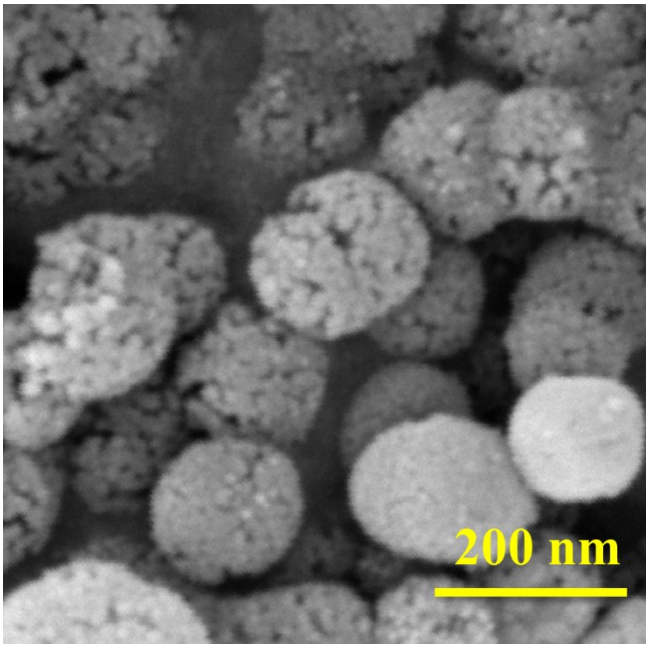

Fig 1S. SEM micrograph of the mesoperous silica(MCM-41)

From Fig 2S, demonstrates three charachteristic diffraction peaks which attribute to the (100), (110) and (200) plans of the hexagonal –ordered silica MCM41[35]

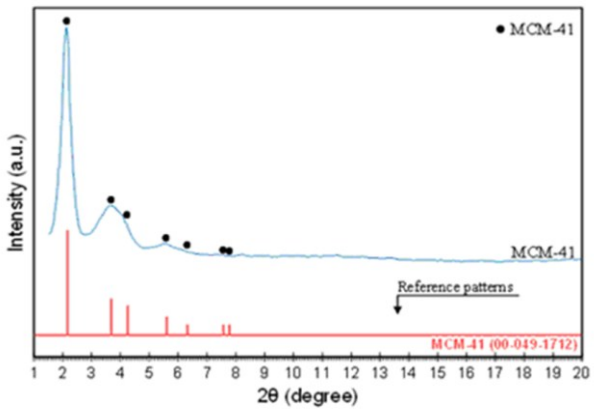

Fig 2S. XRD pattern of the mesoperous silica (MCM-41)

From Fig 3S, the FT-IR spectrum of MCM-41 can be obtained. The absorption peaks at 458.53 and 1090.26nm were associated to the Si-O stretching frequency in SiO_2, whose peak at 458.3 nm is attributed to δ bond O-Si-O and whose peak at 1090.26 nm is attributed to ϑ bond Si-O-Si. Furthermore, the peak at 3425.32 nm associated with the hydroxyl group is attributed to the H-O-H and Si_OH, and that at 3746.35 nm is attributed to –OH [51]

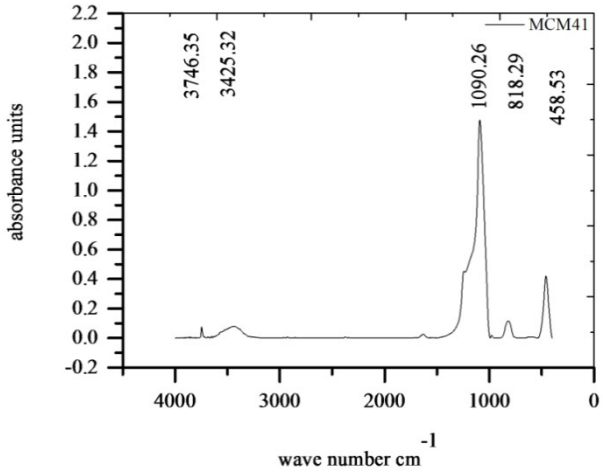

Fig 3S. FTIR curve of the mesoperous silica(MCM-41)