

Supplementary materials

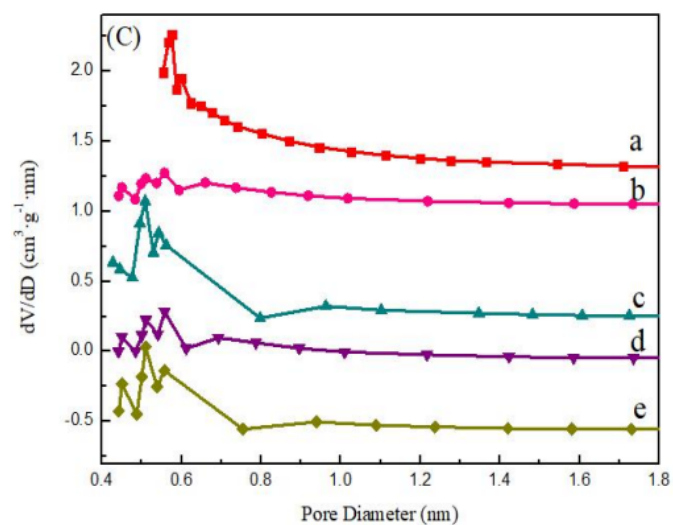


Fig.1s pore size distribution curve (microporous)

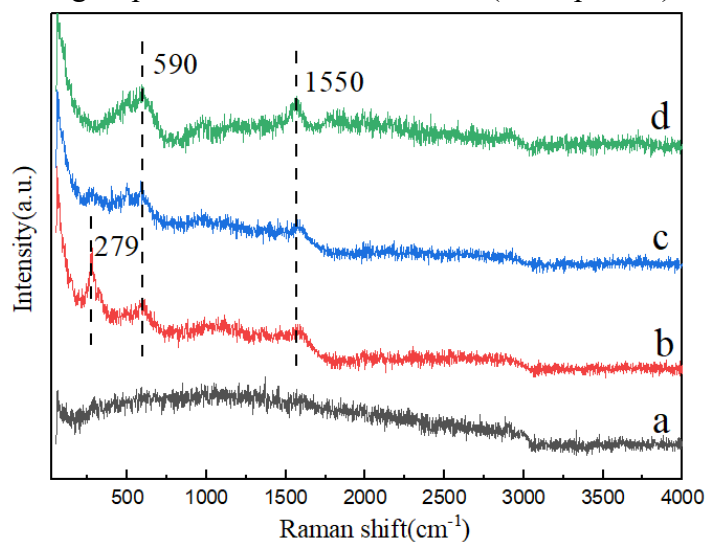


Fig.2s Raman spectra of catalysts (a) 30Cu/SiO₂; (b) 30Cu₂Bi/SiO₂; (c) 30Cu₂Mg/SiO₂; (d) 30Cu₂Mn/SiO₂;