Gel-limited synthesis of dumbbell-like Fe_3O_4-Ag composite microspheres and their SERS properties

Xiaoli Zhang,[a] Chunyu Niu, [a] Yongqiang Wang[a]*, Shaomin Zhou,[a] Jin Liu[b]

Supporting information:

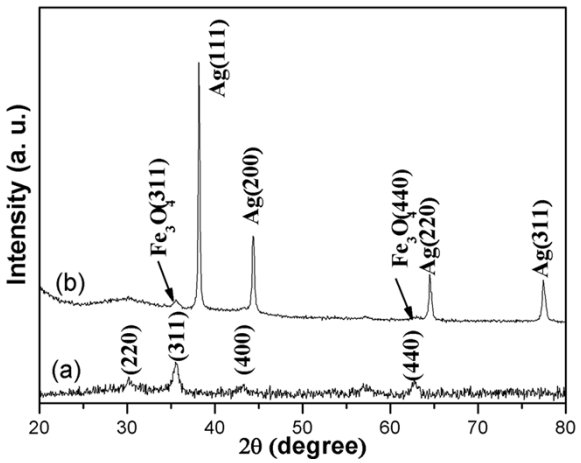

Fig. S1 XRD patterns of (a) Fe_3O_4 microspheres and (b) dumbbell-like Fe_3O_4-Ag composite microspheres

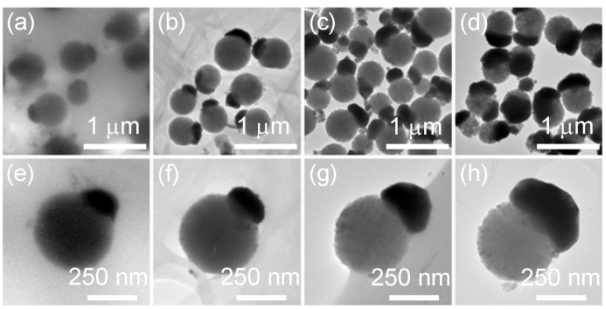

Fig. S2 TEM images of the products obtained at different intervals (h): (a) 1; (b) 2; (c) 4 and (d) 8, and their corresponding magnified images (e-h).

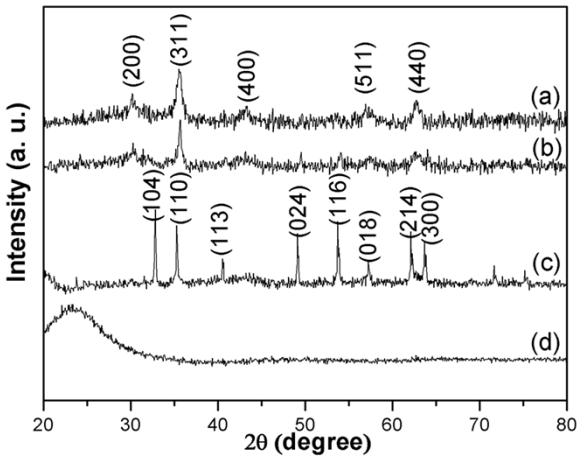

Fig. S3 XRD patterns of different microspheres (a) Fe_3O_4 microspheres; (b) γ-Fe_2O_3 microspheres (500 °C, in N_2 atmosphere), (c) α-Fe_2O_3 microspheres (500 °C, in air atmosphere), and (d) amorphous silica microspheres.

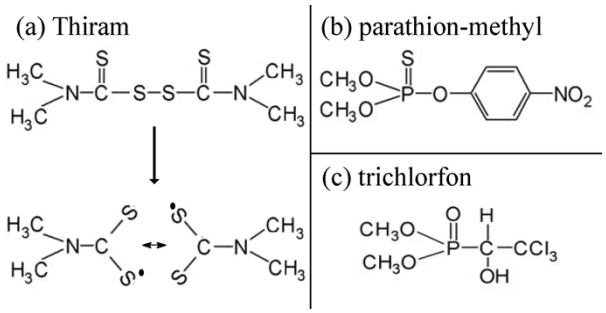

Fig. S4 The chemical structures of (a) thiram, (b) parathion-methyl, and (c) trichlorfon.