Supporting Information:

Performance study of enhanced visible-light-driven photocatalysis and magnetical protein separation of multifunctional yolk-shell nanostructures

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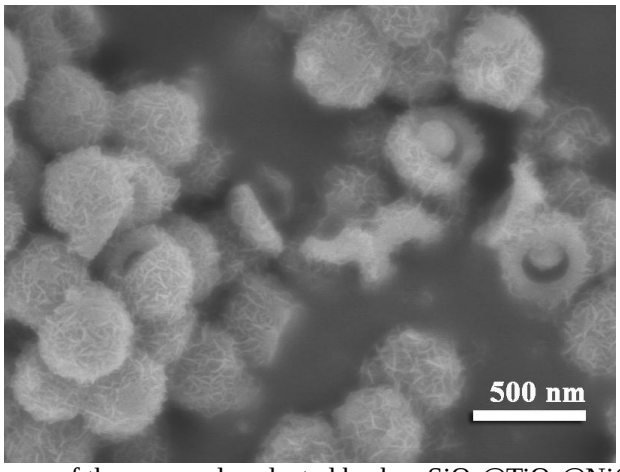

Figure S1. SEM image of the purposely selected broken SiO_2@TiO_2@$Ni(OH)_2$ to reveal the yolk-shell structure.

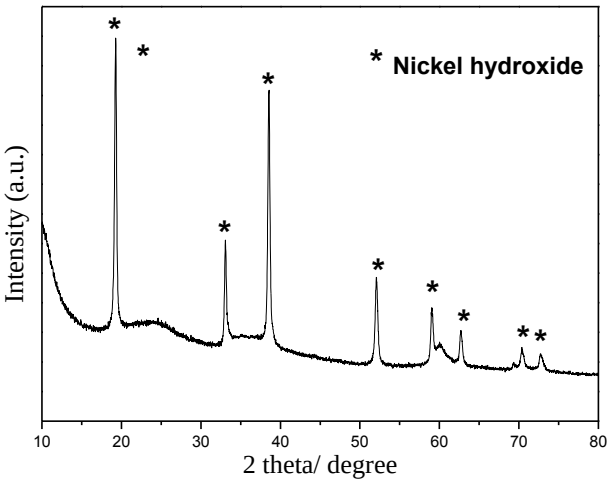

Figure S2. XRD pattern of the product obtained by coating the $Ni(OH)_2$ on the surface of the SiO2@TiO2 microspheres at 110 ^{o}C for 1h.

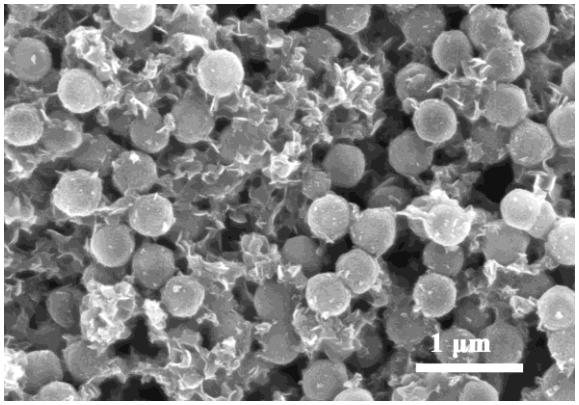

Figure S3. SEM image of as-obtained product obtained with NaOH as the precipitation agent.

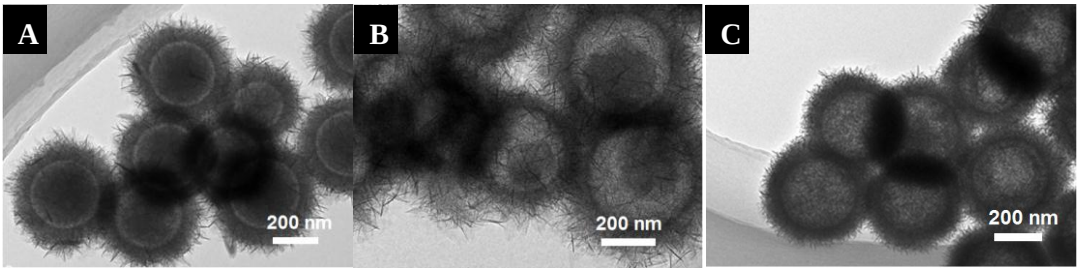

Figure S4. TEM images of (A, B) SiO_2@TiO_2@$Ni(OH)_2$ YSNs with different SiO_2 diameters, and (C) TiO_2@$Ni(OH)_2$ hollow microspheres.

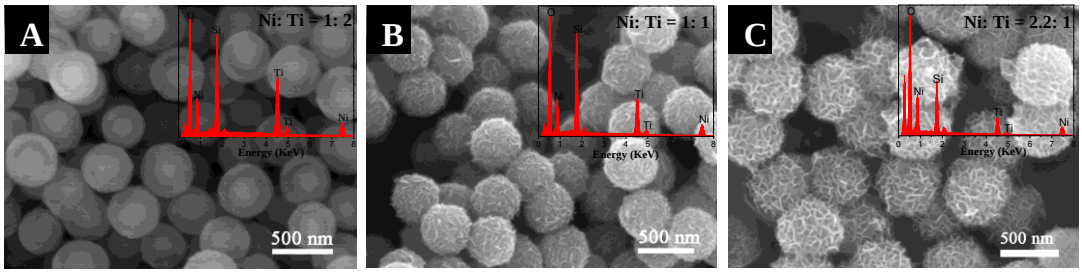

Figure S5 SEM images of the SiO_2@TiO_2@$Ni(OH)_2$ YSNs with different overall diameters: (A) (410±20) nm, (B) (480±20) nm, (C) (600±30) nm.

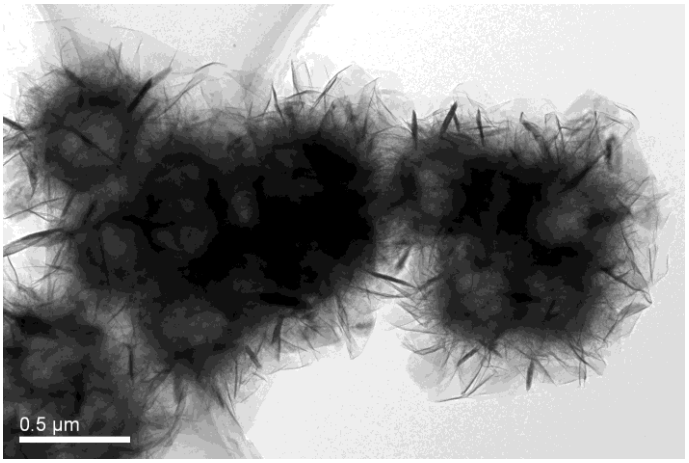

Figure S6 TEM image of as-obtained SiO_2@TiO_2@$Ni(OH)_2$ product prepared in nickel nitrate solution with concentration of 80 mM $Ni(NO_3)_2$.

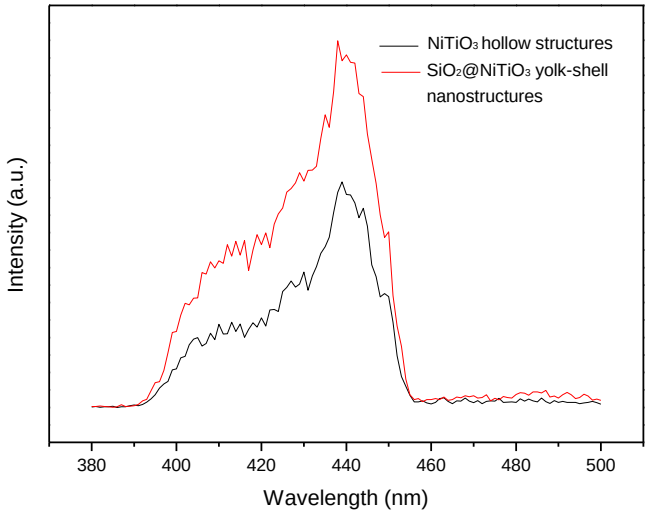

Figure S7 PL Photoluminescence spectra measured at room temperature for $NiTiO_3$ hollow structures and SiO_2@$NiTiO_3$ yolk-shell nanostructures. The excitation wavelength was 221 nm.

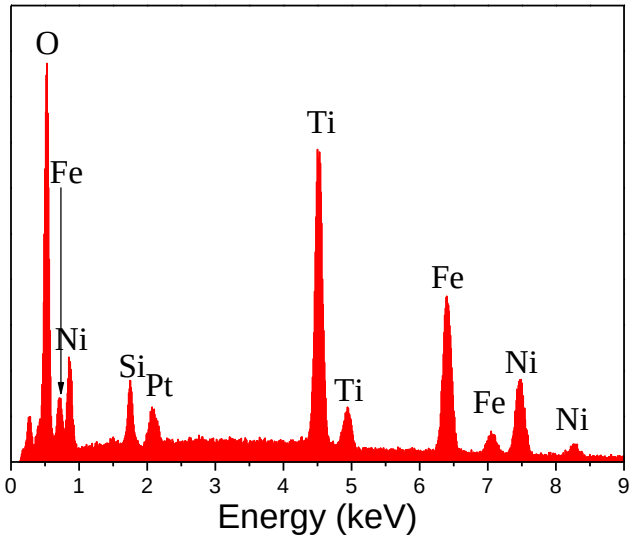

Figure S8. EDX spectra of the final Fe_3O_4@TiO_2@$Ni(OH)_2$ YSNs.