Strong Red Emission of Pure Y_2O_3 Nanoparticles from Oxygen Related Defects

Supporting Information

Experimental Section

In our experiment, 20 mmol Y_2O_3 (Sigma-Aldrich, 99.99%) was dissolved in dilute HNO_3 (1 mol/L) with adding a suitable amount of hexamethylenetetramine (HMT, 5.0 ~ 10.0 g) under vigorous stirring condition, and the solution was then kept at room temperature for 3 h. Afterwards, the precipitation was filtered, washed with distilled water several times, and dried at 60 °C for 8 h in air to yield the fresh sample of ($Y(OH)_3$ NPs). The white powder, $Y(OH)_3$ NPs, was finally calcined at 600°C in air for 4 h to obtain the Y_2O_3 NPs with strong red emission. To obtain Y_2O_3 NPs sample with weak red emission, the calcination was carried out at 400 or 900 °C for 6 h.

20 mmol Y_2O_3 (Sigma-Aldrich, 99.99%) was dissolved in dilute HNO_3 (1 mol/L) with adding a suitable amount of glucose (2.0 ~ 4.0 g) under vigorous stirring condition, and the solution was then kept at room temperature for 10 h. Afterwards, the precipitation was filtered, washed with distilled water several times, and dried at 60 °C for 8 h in air to yield the fresh sample of ($Y(OH)_3$ NPs). The white powder, $Y(OH)_3$ NPs, was finally calcined at 500°C in air for 4 h to obtain the Y_2O_3 NPs with blue emission.

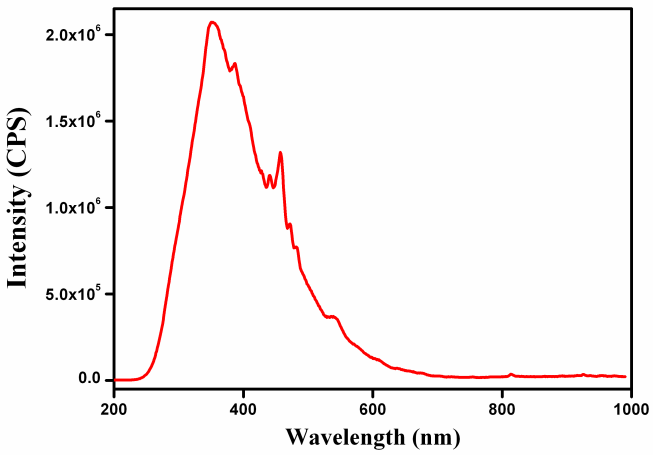

Figure S1. The excitation spectrum of Y_2O_3 NPs with strong red emission.

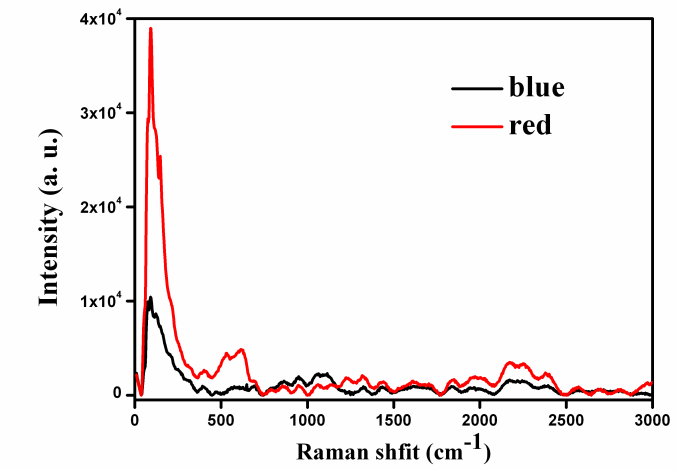

Figure S2. Raman spectra of Y_2O_3 NPs with strong red emission and blue emission (red and black lines, respectively).