

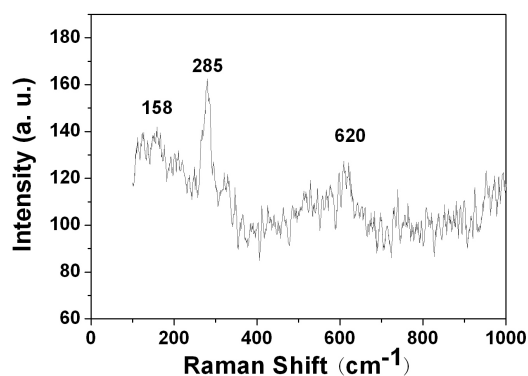
# Template-free room temperature solution phase synthesis of Cu<sub>2</sub>O hollow spheres

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## Raman Scattering Measurement:

Laser Raman spectroscopy was obtained using a LABRAM- HR Confocal Laser MicroRaman spectrometer from 1000 to 0 cm<sup>-1</sup> at room temperature. The 514.5 nm line of the laser was used as the excitation sources, with the capability of supplying 250 mW.

Fig. S1 shows the Raman scattering spectrum of the as-prepared Cu<sub>2</sub>O hollow spheres. There are three Raman peaks at 158, 285, and 620 cm<sup>-1</sup> in Raman spectrum, respectively. The band at 158 cm<sup>-1</sup> can be indexed as  $\Gamma_{15}^{-1}$  (LO) phonon vibration of Cu<sub>2</sub>O. The band at 285 cm<sup>-1</sup> can be indexed as  $2\Gamma_{15}^{-1}$  (LO) phonon vibration of Cu<sub>2</sub>O. While the band at 620 cm<sup>-1</sup> can be indexed as  $\Gamma_{15}^{-2}$  (TO) phonon vibration of Cu<sub>2</sub>O. The previous reported studies indicated that the  $\Gamma_{15}^{-1}$  phonon vibration (at about 285 cm<sup>-1</sup>) of Cu<sub>2</sub>O was very weak compared with the bands at 158 and 620 cm<sup>-1</sup>.<sup>1-4</sup> However, in our present case, the intensity of band at 285 cm<sup>-1</sup> is much stronger than those of bands at 158 and 620 cm<sup>-1</sup>, respectively, indicating that the as-prepared Cu<sub>2</sub>O hollow spheres has a strong enhancement of resonance Raman at 285 cm<sup>-1</sup>.



## Notes and references

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