Monodispersed Octahedral-shaped Pyrite $CuSe_2$ Particles by Polyol Solution Chemical Synthesis

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Chemicals: Copper chloride ($CuCl_2 \cdot 2H_2O$, 99.0%), selenium powder (Se, 99%), triethylene glycol ($C_6H_{14}O_4$, TEG, 99%), triethylenetetramine ($C_6H_{18}N_4$, TETA, 70%), polyvinylpyrrolidone (PVP, Mr =10000), absolute ethanol (CH_3CH_2OH, 99.7%), and high-purity nitrogen gas. All chemicals were directly used as received.

Characterization: X-ray diffraction (XRD) was detected by Rigaku D/Max 2500V/PC X-ray powder diffractometer (Japan) with CuKα radiation source (λ = 1.54Å) operating at 40 kV and 200 mA and a scan rate of 8°/min from 2θ = 10° to 90°. Morphology and composition were performed by FEI Tecnai G2 F20 field-emission transmission electron microscope with SAED attachment (Netherland) and Hitachi S-4800 field emission scanning electron microscope with EDX attachment (Japan). Raman spectra were carried out on RENISHAW in Via reflex (England). Optical absorption was recorded at wavelength range from 300 nm to 1400 nm by Hitachi U-4100 UV/vis/NIR spectrophotometer (Japan). XPS were carried out on Esca Multiplex Philips-1600 X-ray photoelectron spectrometer (Netherland).

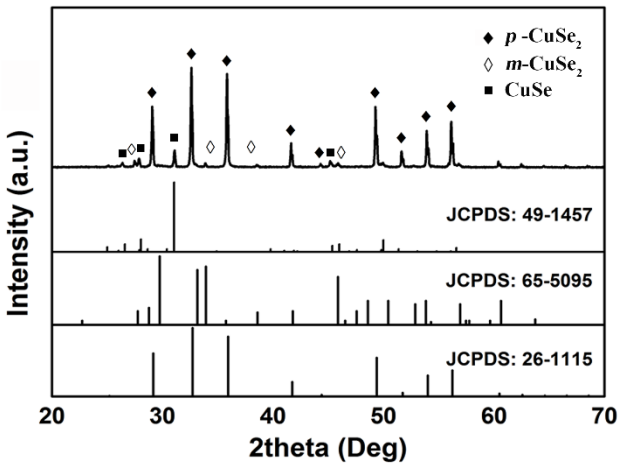

Fig. S1 XRD pattern of sample prepared at 250 °C

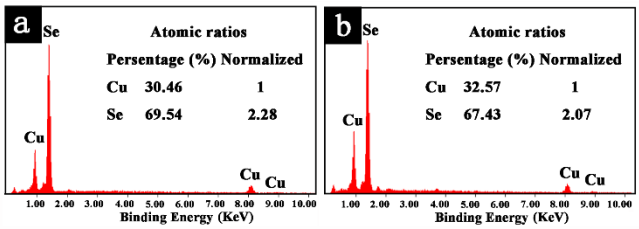

Fig. S2 (a, b) EDX spectra images of products synthesized at 190 °C and 210 °C.

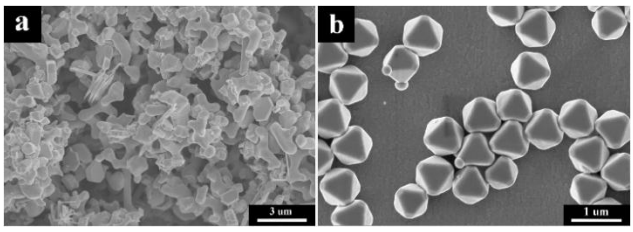

Fig. S3 (a, b) SEM image of product synthesized with PVP adding amount of 0 g and 0.2 g respectively.

Electronic Supplementary Material (ESI) for CrystEngComm