Synthesis of Two-Dimensional Single-Crystal Berzelianite Nanosheets and Nanoplates with Near-Infrared Optical Absorption

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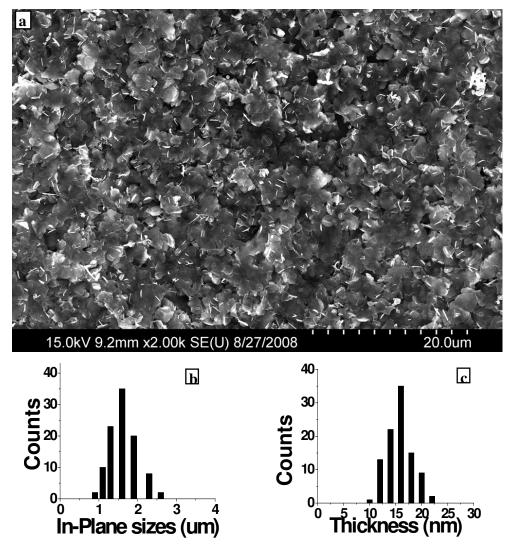


Fig. S1 (a) SEM images of $Cu_{2-x}Se$ nanosheets show that great deals of nanosheets are synthesized with uniform morphology and size; (b) In-plane diameter distribution histograms of the $Cu_{2-x}Se$ nanosheets with more than 100 nanosheets calculated; (c) Thickness distribution histograms of the $Cu_{2-x}Se$ nanosheets with more than 100 nanosheets calculated.

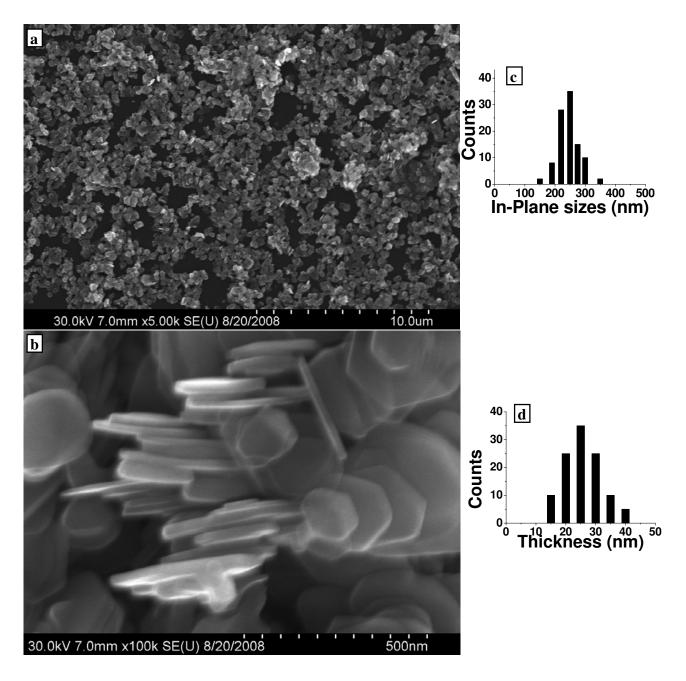


Fig. S2 (a, b) SEM images of $Cu_{2-x}Se$ nanoplates show that great deals of nanoplates are synthesized with uniform morphology and size; (c) In-plane diameter distribution histograms of the $Cu_{2-x}Se$ nanoplates with more than 100 nanoplates calculated; (d) Thickness distribution histograms of the $Cu_{2-x}Se$ nanoplates with more than 100 nanoplates calculated.

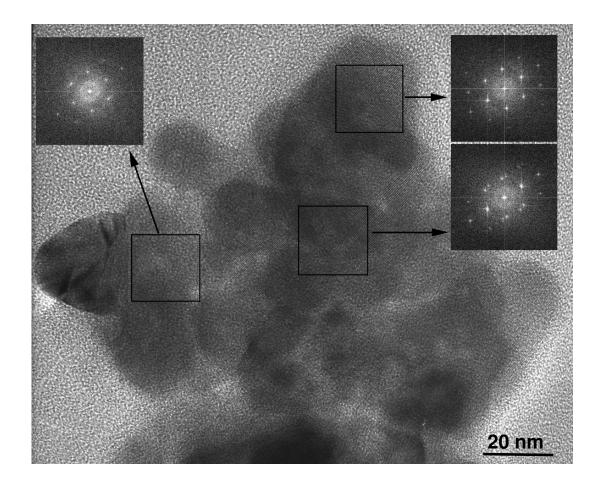


Fig. S3 HRTEM image and its corresponding fast Fourier transforms (FFTs) of the middle product in the formation of the $Cu_{2-x}Se$ nanosheets products harvested at the 250°C after t = 3 minutes reaction time, showing the obvious "oriented attachment" growth process.

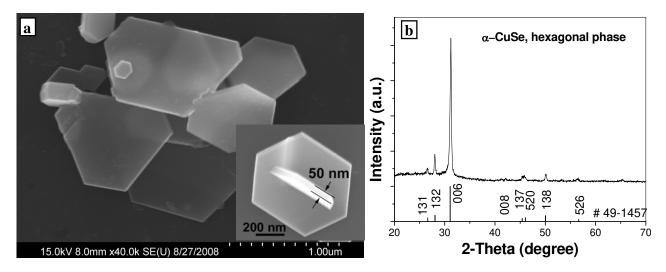


Fig. S4 SEM images (left) and XRD pattern (right) of the α-CuSe microplates, using $Cu(NO_3)_2$ instead of CuCl as the precursor with Cu:Se=2:1, while keeping the other parameter the same as the $Cu_{2-x}Se$ nanosheets. Note that the in-plane diameter of the typical microplates is about 500 nm, while the thickness is about 50 nm.

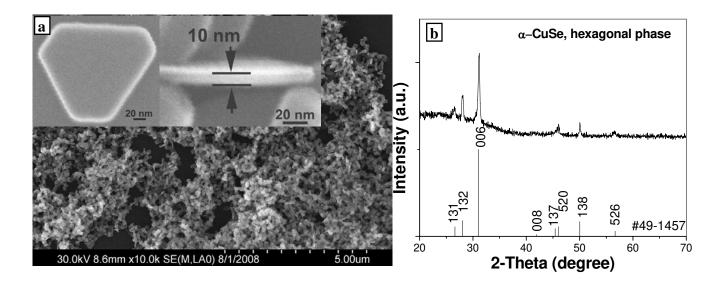


Fig. S5 SEM images (left) and XRD pattern (right) of the α-CuSe nanoplates, using $Cu(NO_3)_2$ instead of CuCl as the precursor with Cu:Se=1:1, while keeping the other parameter the same as the $Cu_{2-x}Se$ nanoplates. Note that the in-plane diameter of the nanoplates is about 100 nm, while the thickness is about 10 nm.