

Supplementary Information

To improve our understanding of the above mechanism, experiments were performed under similar conditions when diethylenetriamine was replaced by other solvents such as ethylenediamine and oleylamine. In oleylamine, many diffraction peaks appeared in the XRD patterns which could be indexed to copper selenide, and copper boron, but no characteristic peaks of chalcopyrite structure appeared (as shown in Figure S1). In ethylenediamine, a longer reaction time (at least 72 h) was required in order to obtain the product with almost the same crystalline as that in diethylenetriamine (as shown in Figure S2). The above results indicate that diethylenetriamine is the optimal solvent for this reaction.

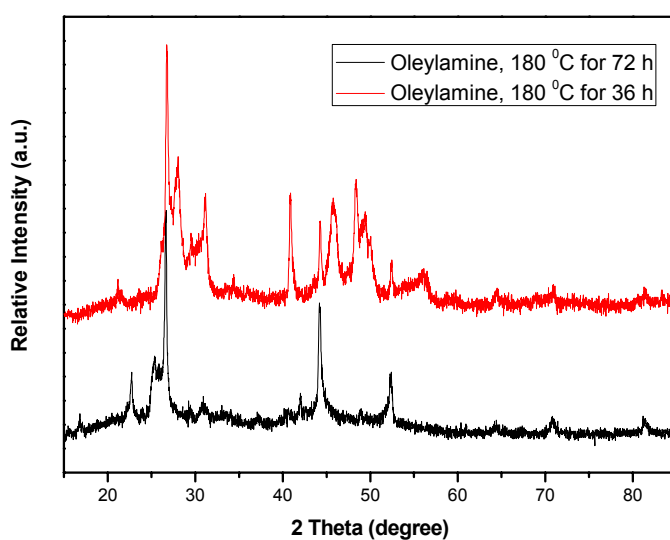


Figure S1. XRD patterns of ternary CuBSe nanocrystals synthesized by the solvothermal process with oleylamine at at 180 °C for 36 h and 72 h, respectively.

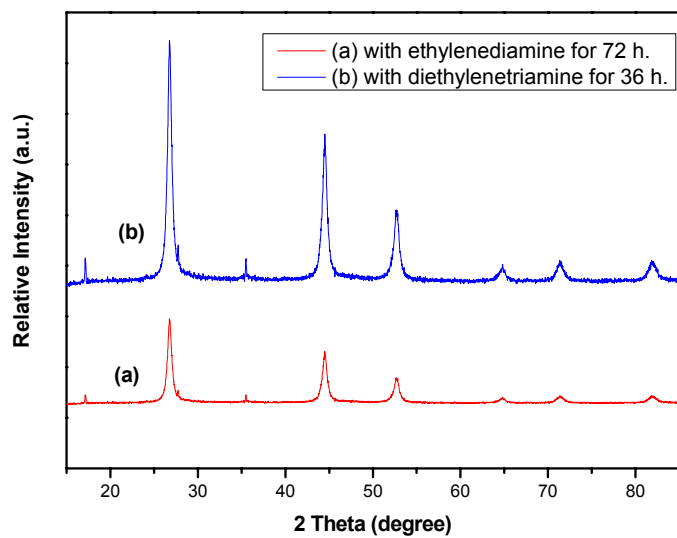


Figure S2. XRD patterns of ternary CuBSe nanocrystals synthesized by the solvothermal process with diethylenetriamine at 180°C for 36 h and with ethylenediamine at 180°C for 72 h, respectively.