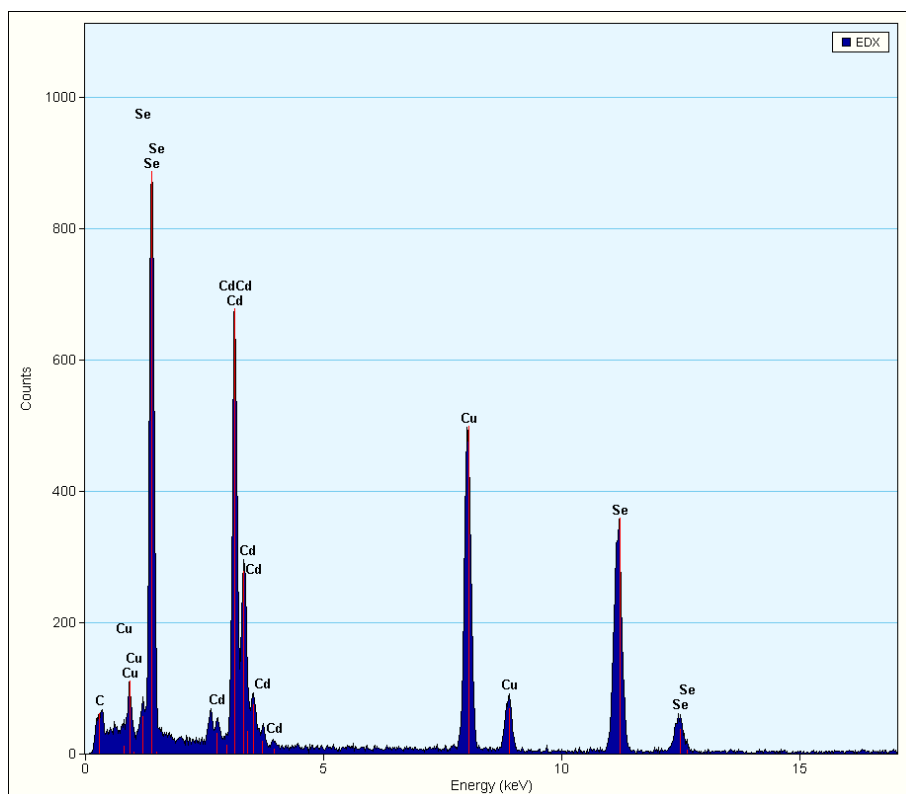


# Supporting Information

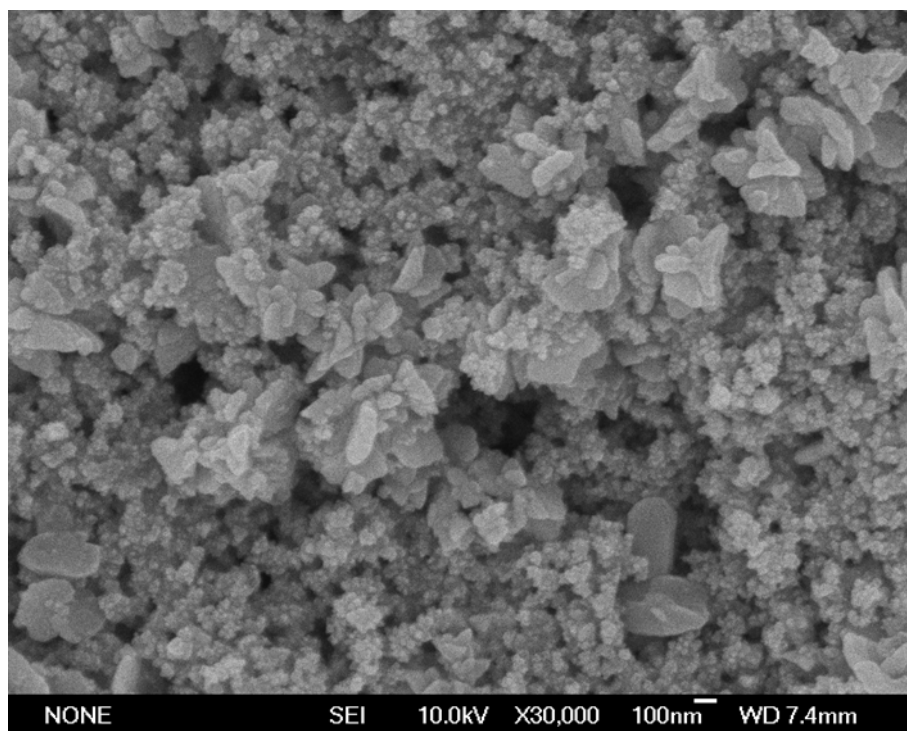
## Experimental section

**Synthesis** All the chemicals were of analytical grade and used without further purification. In a typical synthesis of flower-like CdSe dendrites, cadmium chloride ( $\text{CdCl}_2 \cdot 2.5\text{H}_2\text{O}$ , 0.025 mmol) and selenium dioxide ( $\text{SeO}_2$ , 0.025 mmol) was dissolved into the mixed solvents composed of 20 ml ethanol and 5 ml ionic liquid based on formic acid (HCOOH, 88%) and N, N-dimethylformamide (DMF) with the same molar ratio. The above solution was transferred into Teflon-lined stainless steel autoclave and maintained at 150 °C for 24 h, and cooled to room temperature naturally. Finally, the resulting products were collected by using a centrifuge, washed several times using distilled water and absolute ethanol, and dried under vacuum at 50 °C for 4 h.

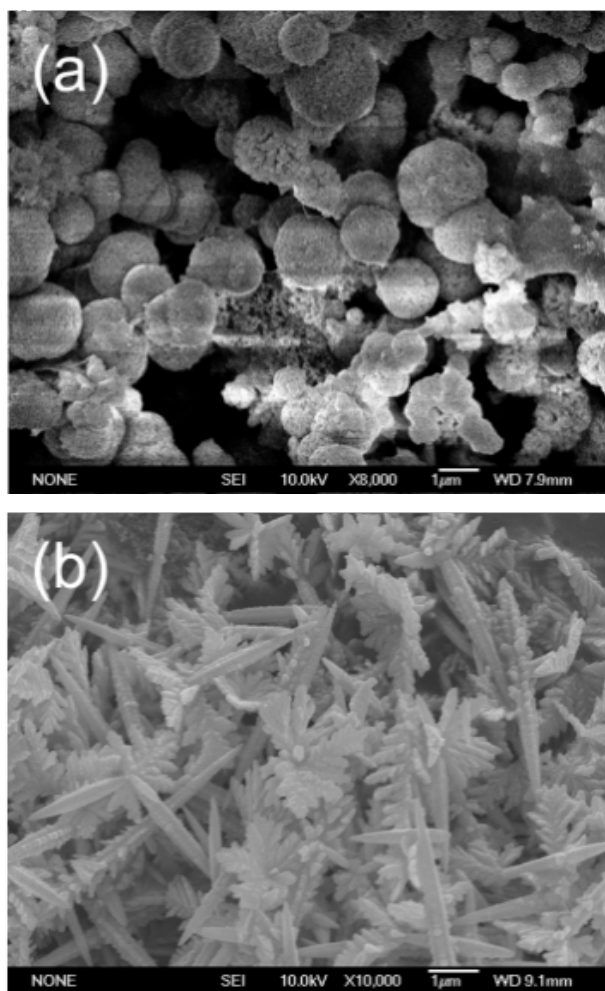
**Characterization** X-ray powder diffraction (XRD) measurements were performed on a Rigaku D/max 2500 diffractometer with Cu K $\alpha$  radiation ( $\lambda = 0.154056$  nm) at 40 kV and 120 mA, using a nickel filter. Scanning electron microscopy (SEM) images were taken with a FESEM (JEOL-6300F, 15 kV). High-resolution transmission electron microscopy (HRTEM) images were recorded with a Tecnai G2 20 S-Twin transmission electron microscope operating at an accelerating voltage of 120 and 200 kV, respectively.



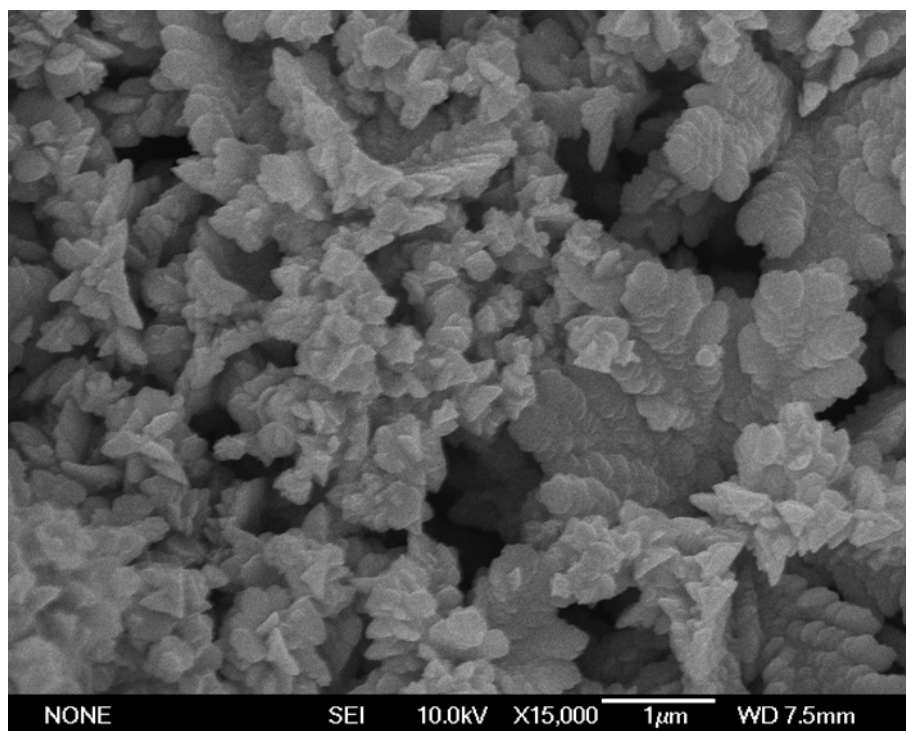
**Fig. S1** EDX spectrum of the as-prepared flower-like CdSe dendrites synthesized under solvothermal condition with mixed solution composed of 20 ml ethanol and 5 ml ionic liquid based on formic acid (HCOOH, 88%) and N, N-dimethylformamide (DMF) with the same molar ratio at 150 °C for 24 h.



**Fig. S2** SEM image of the as-prepared CdSe nanoparticles 25 ml ionic liquid based on formic acid (HCOOH, 88%) and N, N-dimethylformamide (DMF) with the same molar ratio at 150 °C for 24 h.



**Fig. S3** SEM images of the as-prepared samples: (a) microspheres from mixed solution of 20 ml ethanol and 5 ml DMF and (b) sword-like dendrites from 20 ml 1-butanol and 5 ml ionic liquid based on formic acid (HCOOH, 88%) and N, N-dimethylformamide (DMF) with the same molar ratio.



**Fig. S4** SEM image of the as-prepared CdSe aggregates synthesized under solvothermal condition with mixed solution composed of 20 ml water and 5 ml ionic liquid based on formic acid (HCOOH, 88%) and N, N-dimethylformamide (DMF) with the same molar ratio at 150 °C for 24 h