## Supporting Information

## A Generalized Strategy for Controlled Synthesis of Ternary Metal Sulfide

## Nanocrystals

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Figure S1. AFM image (a) and EDS pattern (b) of  $Cu_3BiS_3$  nanosheets. Thickness of  $Cu_3BiS_3$  nanosheets is about 4 nm.



Figure S2. EDS pattern of Cu<sub>4</sub>Bi<sub>4</sub>S<sub>9</sub> nanowires.



Figure S3. SEM image (a) and EDS pattern (b) of Cu<sub>4</sub>Bi<sub>4</sub>S<sub>9</sub> nanoribbons.



Figure S4. TEM image (a) and XRD pattern (b) of Bi nanoparticles synthesized by  $Cu(DDTC)_2$  and  $Bi(DDTC)_3$  in the DT solution at 220 °C for 1 h.



Figure S5. TEM image (a) and XRD pattern (b) of tadpole-shaped  $CuInS_2$  nanoparticles synthesized at  $Cu(DDTC)_2$ Phen :  $In(DDTC)_3=1:1$  in the DT solution at 240 °C for 1 h.



Figure S6. SAED pattern (a) and EDS pattern (b) of AgBiS<sub>2</sub> nanoparticles.



Figure S7. SAED pattern (a) and EDS pattern (b) of Ag<sub>8</sub>SnS<sub>6</sub> nanoparticles.