Supporting Information

Phase Controlled One Dimensional Shape Evolution of InSe Nanocrystals

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Experimental TEM and HRTEM images were recorded with a JEOL 2100F unit operated at 200 kV. The samples for TEM study were prepared by drop casting nanomaterials dispersed in hexane on carbon-coated copper grids. The TEM studies were performed on as-prepared samples without employing size-selection process. EDS was performed on a FE-SEM (JSM6700F). Powder XRD patterns were obtained on a Rigaku Max-2200 with filtered Cu_{ka} radiation. Indium chloride, Se, and oleylamine were purchased from Aldrich Co..

Figure S1. Magnified and low magnification TEM images of cubic InSe nanowires having 7.8 nm diameter.

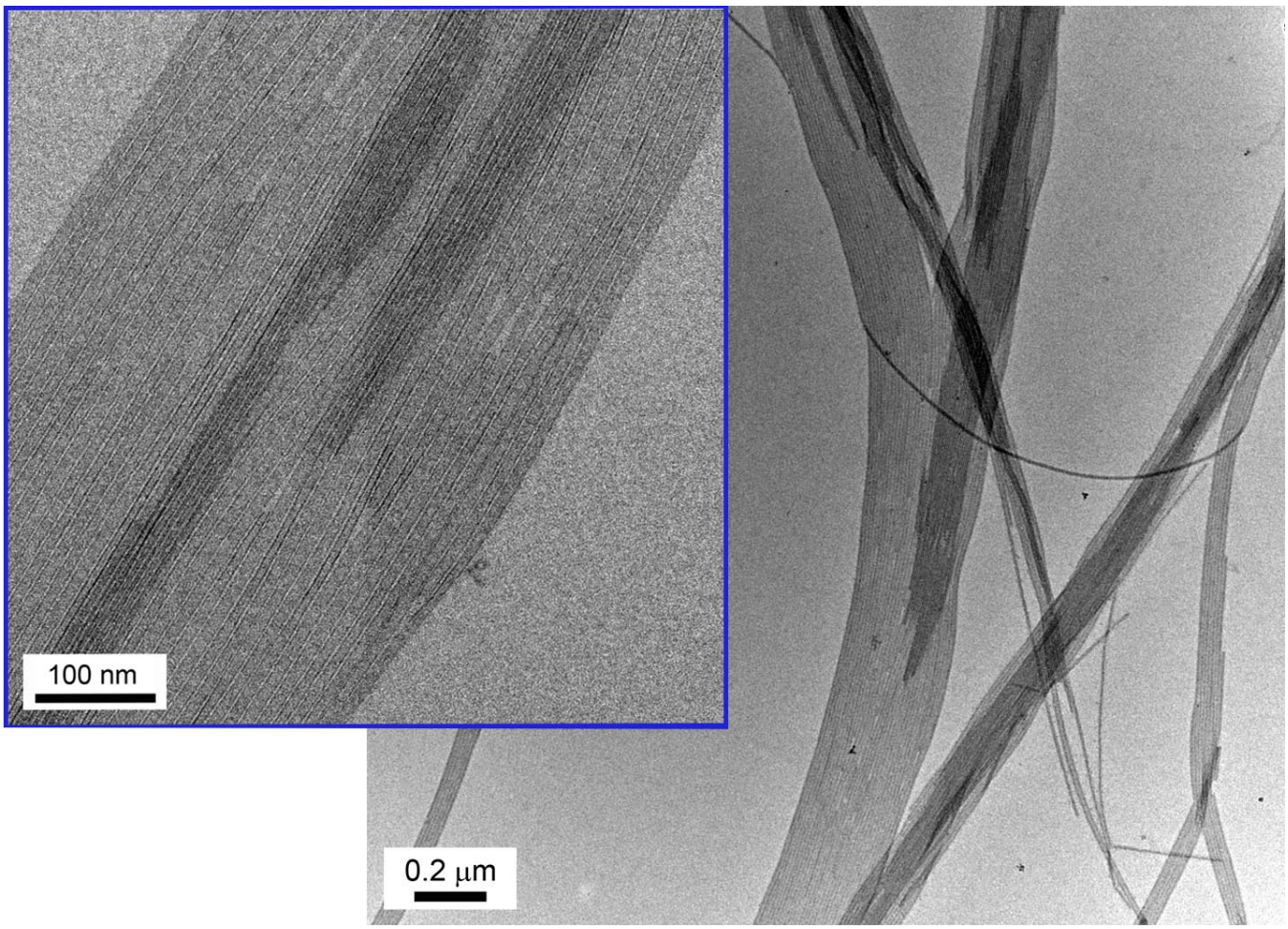


Figure S2. Magnified TEM images of time chasing TEM study: (a) at 200 ^{o}C, (b) at 215 ^{o}C, (c) after 2hrs aging, (d) after 5hrs aging.

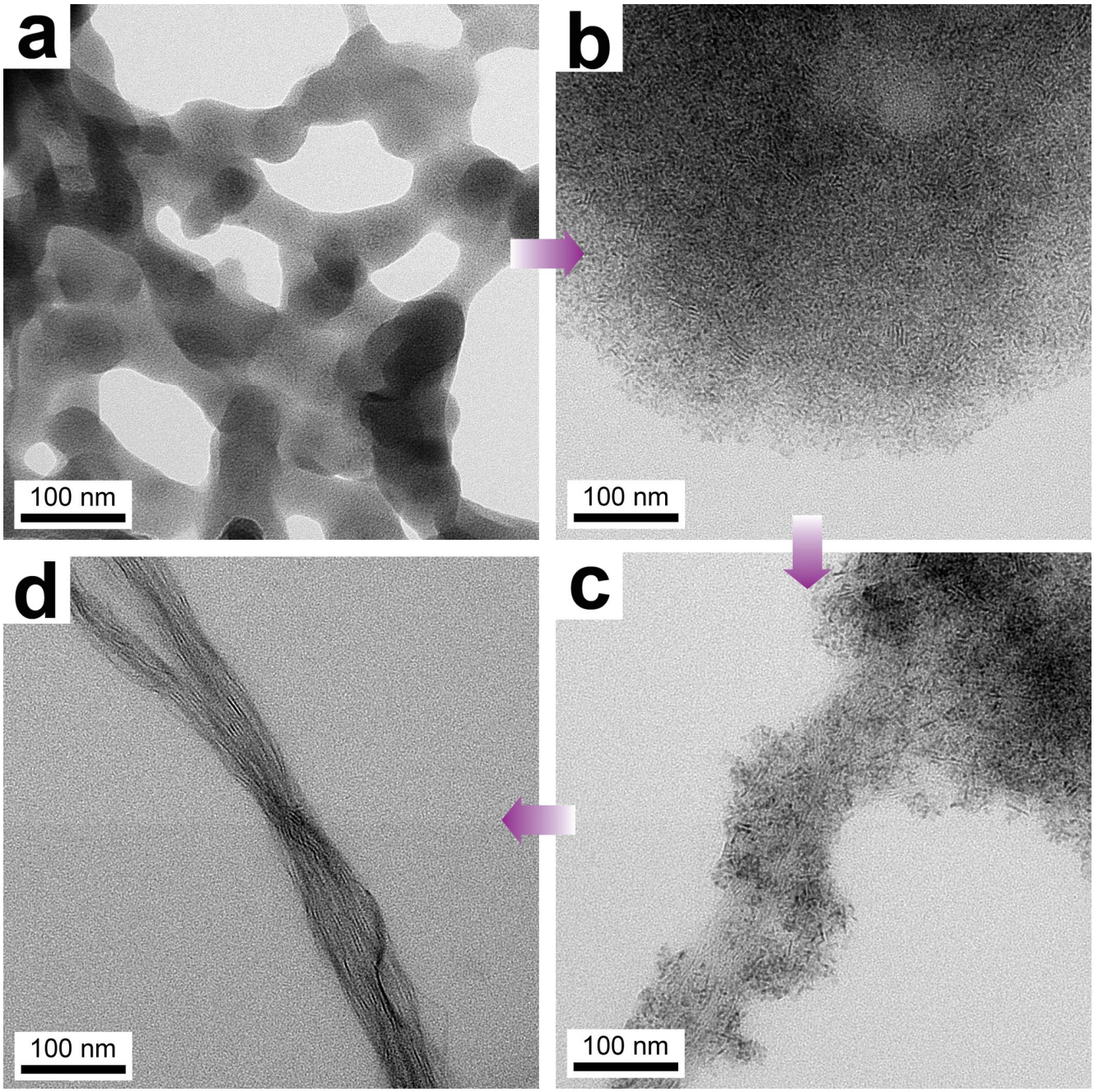
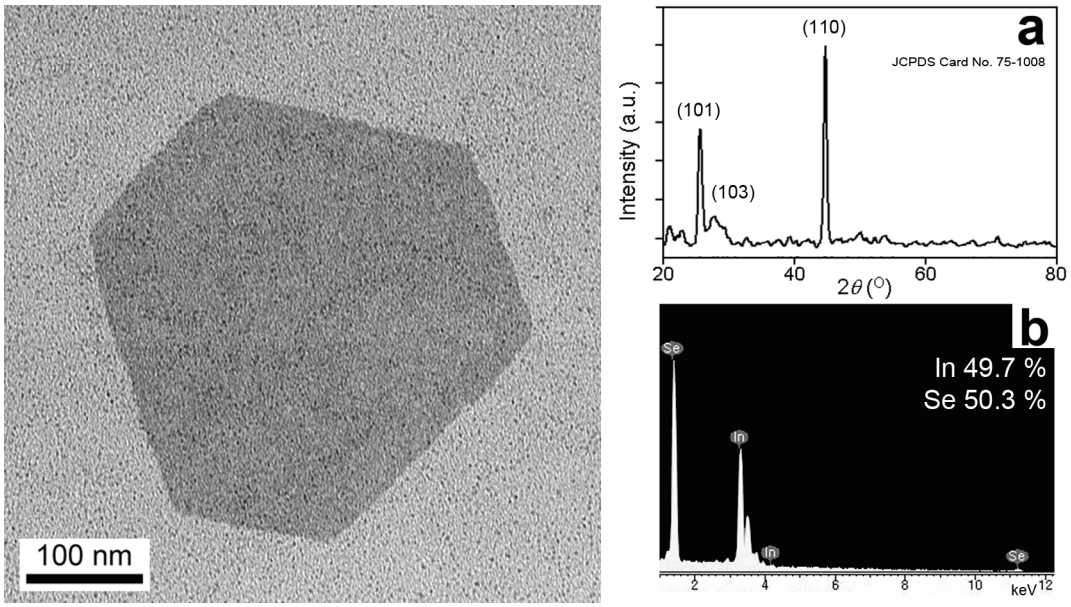


Figure S3. Powder XRD pattern of hexagonal phase InSe Nanoplates(a) and EDX spectrum(b).



Difference in Experimental Conditions

Synthesis of cubic nanowires: 0.10 g (0.45mmol) $InCl_3$ and Se powder (0.054 g or 0.043 g or 0.036 g) were added to well-dried oleylamine (9mL) at 110^{o}C. At this temperature, indium chloride was dissolved but Se powder was not soluble. (refer to solubility test of Se powder in oleylamine in text of paper) The reaction temperature was increased rapidly to 215^{o}C. Above 205 ^{o}C, *the yellow precipitates* were formed and eventually the color of reaction mixture became chocolate-brown for aging step. TEM image of the yellow precipitates revealed short rods and that of the chocolate-brown precipitates showed long wires.

Synthesis of hexagonal nanoplates: *0.054 g Se powder was dissolved in oleylamine (9mL) by heating*. And the solution was cooled to 110^{o}C and 0.10 g (0.45mmol) $InCl_3$ was added. The reaction temperature was increased rapidly to 215^{o}C. Around 190^{o}C, the reaction mixture turned black, which implies the formation of nanocrystals. The TEM image of the black precipitates revealed plates. Through this observation, we conclude that the formation temperature of plates is lower than that of cubic nanowires.