SUPPORTING INFORMATION

Shape-Controlled Conversion of β -Sn Nanocrystals into Intermetallic M -Sn ($M = \text{Fe, Co, Ni, Pd}$) Nanocrystals

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Figure S1. (a) EDS data for intermetallic FeSn₂ nanocrystals showing a 1:2 Fe:Sn ratio; (b) EDS data for intermetallic PdSn nanocrystals showing a 1:1 Pd: Sn ratio; (c) TEM micrograph for FeSn₂ (both small and large nanocrystals, similar to those shown in Figure 5d); (d-e) semi-STEM elemental mapping data for the TEM micrograph in (c), clarifying that Fe (d) is present in the same areas as the Sn (e) .

Figure S2. Representative powder XRD patterns for Sn (left), CoSn₂ (middle), and Ni₃Sn₄ (right). CoSn₂ and Ni₃Sn₄ were synthesized as described in the text (β -Sn nanoparticles reacted with Co²⁺ and Ni²⁺ with no NaBH₄, supporting a diffusion-based mechanism).

Figure S3. Representative sample of (a) bimodal β -Sn nanocrystals, similar to those used to make the bimodal FeSn₂ nanocrystals shown in Figure 5a, and (b) a mixture of spherical and cubic β -Sn nanocrystals, similar to those used to make the CoSn₃ nanocrystals shown in Figure 8a.

Figure S4. HRTEM micrograph for the PdSn nanocrystal shown in Figure 7b, showing a single-domain PdSn nanocrystal (inset: same low-resolution TEM micrograph shown in Figure 7b).

Figure S5. Crystal structures of $\beta\text{-Sn}$ and CuAl₂-type FeSn₂ (green = Fe, purple = Sn), highlighting conserved structural features (zigzag chains of Sn atoms) that likely help to facilitate the single crystal-to-single crystal transformation.