Supporting Information for
A Facile One-Step Approach for Synthesis and Assembly of Copper and Copper-Oxide Nanocrystals

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Figure S1. The effect of the amine chainlength on nanocrystal packing density: A) TOP-Octylamine, B) TOP-Dodecylamine, C) TOP-Hexadecylamine, D) TOP-Octadecylamine.
Figure S2. Copper sulfide nanocrystal CPF. A) SEM image of copper sulfide shows the assembly of the nanocrystals B) EDX spectrum with a ratio of copper to sulfur of 2:1 C) XRD pattern of the Cu$_{2-x}$S.
Figure S3. The effect of the concentration of the precursor in 1 mL TOP:ODA (1:1) A) 20 mg CuCup₂ B) 40 mg CuCup₂ C) 60 mg CuCup₂ D) 80 mg CuCup₂. We can see that the thickness of the organic film increases with increasing concentration of the CuCup₂. Also, we observe an increase in the amount of Cu nanoparticle domains within the film with increasing concentration.
**Figure S4.** XRD patterns of closed packed films of Cu$_2$O and Cu NPs

**Figure S5.** A scheme of cupferrate complexes, A) The Cu-cupferrate (CuCup2 and B) Mn-cupferrate (MnCup2).