Supporting Information for

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

Mahmud Diab[a], Brian Moshofsky[a], Ilan Jen-La Plante[a] and Taleb Mokari*[a]

[a]Department of Chemistry and Ilse Katz Center for Nanoscience and Nanotechnology, Ben Gurion University of the Negev, 84105, Israel.
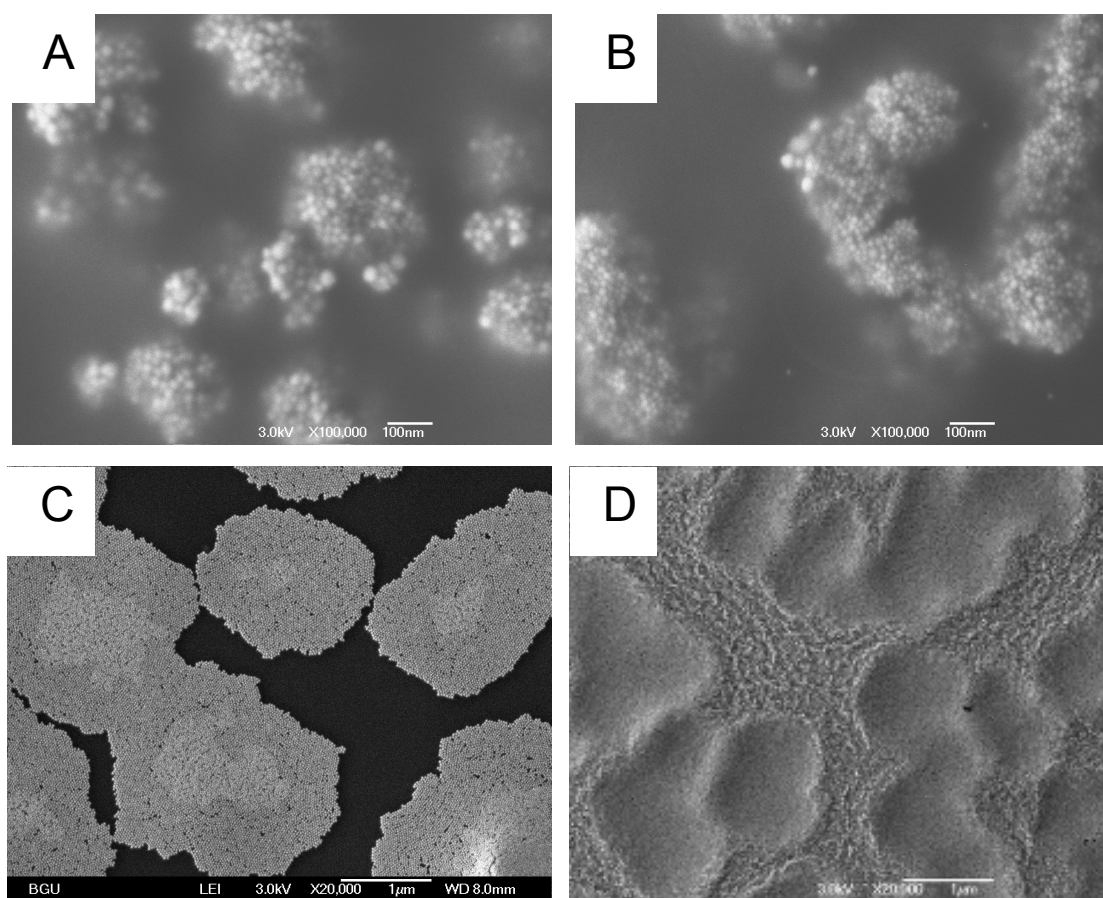
[*] E-mail: mokari@bgu.ac.il

Figure S1. The effect of the amine chainlength on nanocrystal packing density: A) TOP:Octylamine, B) TOP:Dodecylamine, C) TOP:Hexadecylamine, D) TOP:Octadecylamine.
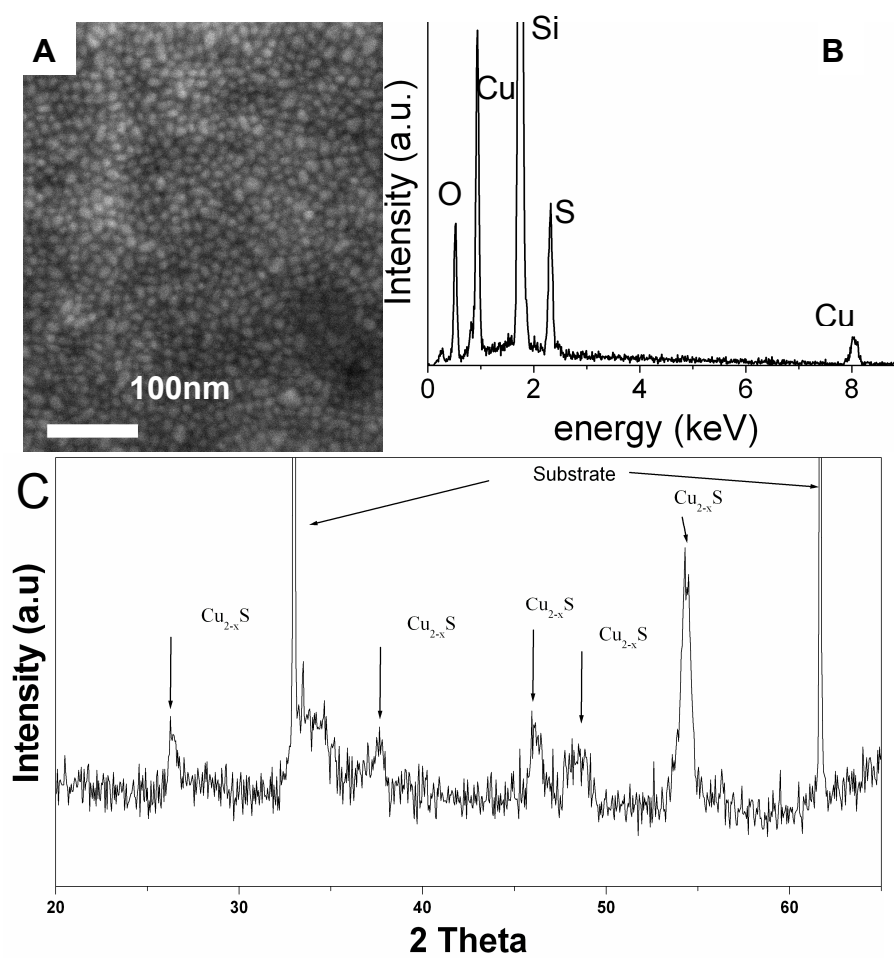
Figure S2. Copper sulfide nanocrystal CPF. A) SEM image of copper sulfide shows the assembly of the nanocrystals B) EDX spectrum with a ratio of copper to sulfur of 2:1 C) XRD pattern of the $Cu_{2-x}S$.
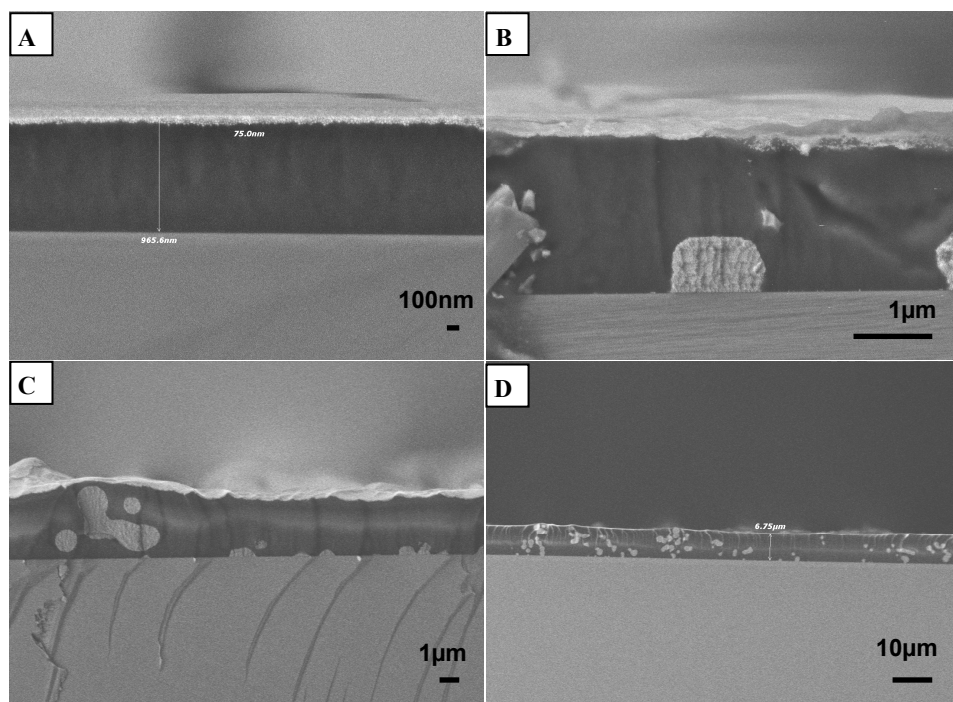
Figure S3. The effect of the concentration of the precursor in 1 mL TOP:ODA (1:1) A) 20 mg $CuCup_2$ B) 40 mg $CuCup_2$ C) 60 mg $CuCup_2$ D) 80 mg $CuCup_2$. We can see that the thickness of the organic film increases with increasing concentration of the $CuCup_2$. Also, we observe an increase in the amount of Cu nanoparticle domains within the film with increasing concentration.
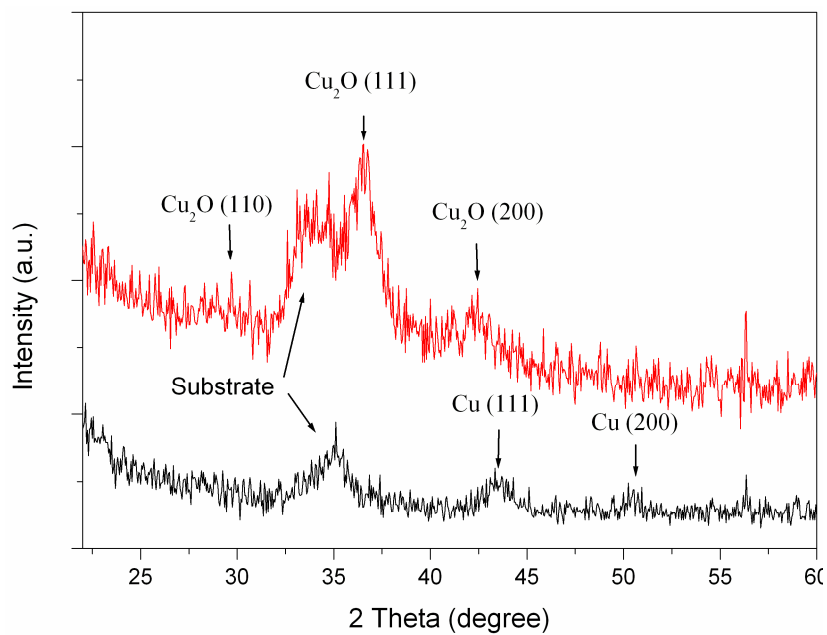
Figure S4 . XRD patterns of closed packed films of Cu_2O and Cu NPs

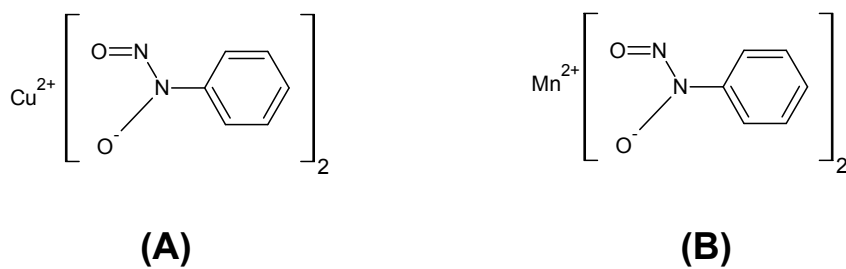**(A)**   **(B)**

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