

*Supplementary Information for*

**Cations-induced fast growth of ultrathin cuprous  
chloride nanoplatelets**

Zhongzheng Miao, Minghui Liang, Zhichang Xiao, Badshah Amir,

Xianglong Li\*, Linjie Zhi\*

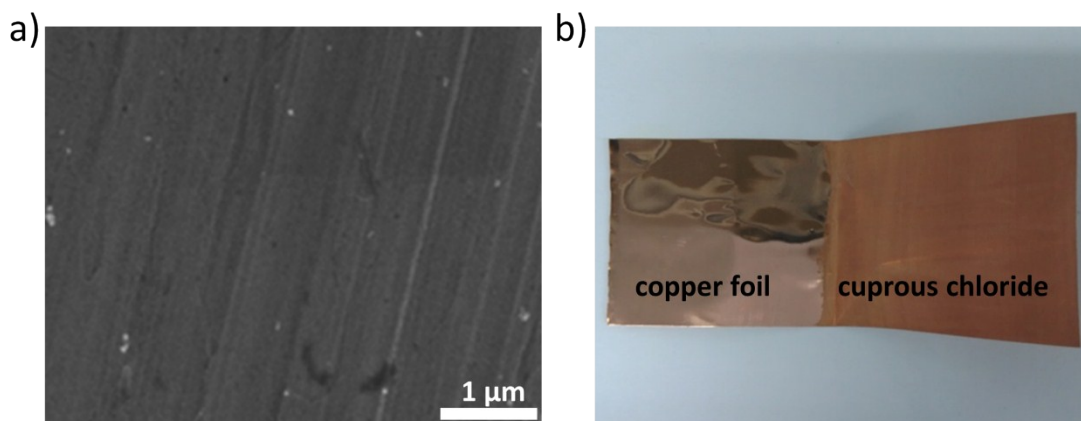
## **Experimental Section**

### **Materials:**

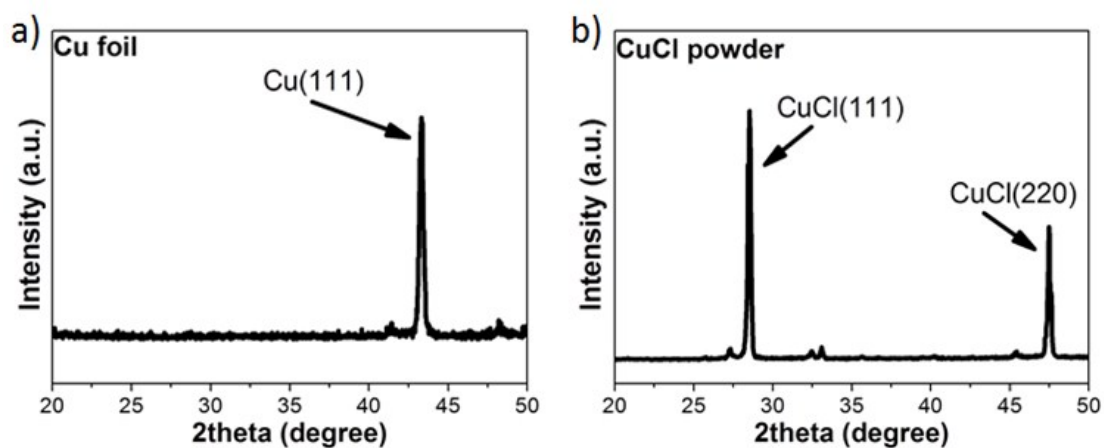
The cupric chloride ( $\text{CuCl}_2$ , hydrate extra pure AR (99.999%)) and ferric chloride ( $\text{FeCl}_3$ , anhydrous pure AR (98%)) were obtained from Alfa Aesar; Copper foils (the thickness is 25  $\mu\text{m}$  and the width is 150 mm) were obtained from Tianjin Xinlu Co. Ltd. Ultrapure water was used as the solvent in some cases; all other chemicals were used without any further purification. Three kinds of  $\text{CuCl}_2$  solution were prepared by dissolving 1 mmol  $\text{CuCl}_2$  powder in 10 ml of water ( $\sim 0.1$  M), 10 ml of ethanol, and/or 10 ml of ethanol-water (v:v, 1:1). In the cases with ferric ions ( $\text{Fe}^{3+}$ ), the  $\text{FeCl}_3$  was introduced and the molar ratio of  $\text{Fe}^{3+}$  (from  $\text{FeCl}_3$ ) to  $\text{Cu}^{2+}$  (from  $\text{CuCl}_2$ ) was adjusted in the range of 0.01-10%. The solution was stirred at around 20°C for 5 minutes to get a clear solution. The fresh copper foil was immersed into the prepared solution for several seconds and pulled out vertically. Redundant liquid was sucked up by a piece of filter paper. Then the copper foil coated with a thin liquid film was kept for the growth and formation of  $\text{CuCl}$  crystals at 333 K.

### **Characterization:**

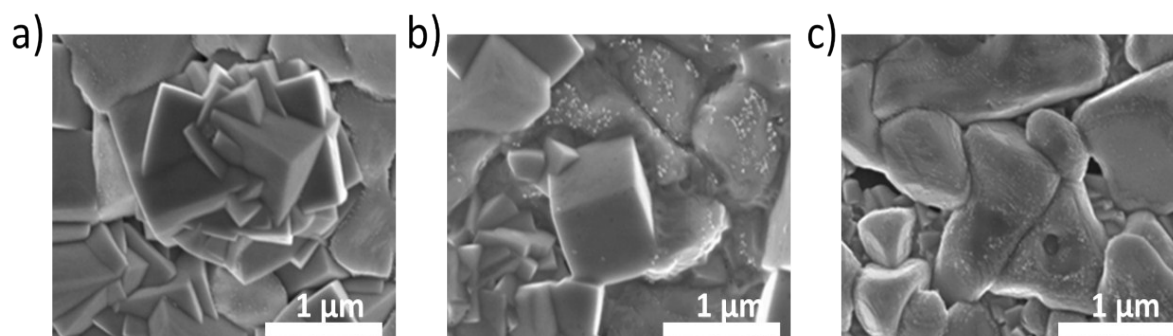
The morphology and structure of the samples were characterized by scanning electron microscopy (SEM, Hitachi S4800), transmission electron microscopy (TEM, Tecnai F20 U-TWIN and Tecnai G2 20 STWIN), and atomic force microscopy (AFM, Dimension 3100). The X-ray diffraction (XRD) instrument type is D/MAX-TTRIII (CBO).



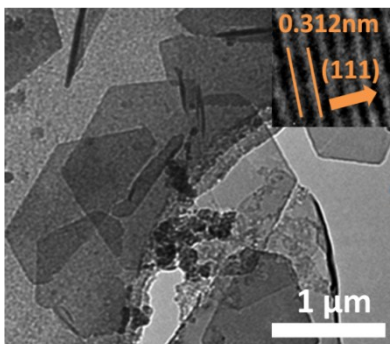
**Figure S1** (a) SEM image of copper foil, (b) optical photograph of copper foil before and after the cuprous chloride (CuCl) growth as annotated.



**Figure S2** XRD patterns of (a) copper foil and (b) commercial cuprous chloride (CuCl) powder.



**Figure S3** SEM images of CuCl crystals formed with the addition of a certain volume of different concentrations of HCl solutions: (a) pH=4, (b) pH=2, (c) pH=1.5.



**Figure S4** TEM image and high-resolution TEM image (inset) of CuCl nanoplatelets.