Supplementary Information for

Cations-induced fast growth of ultrathin cuprous chloride nanoplatelets

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Experimental Section

Materials:
The cupric chloride (CuCl₂, hydrate extra pure AR (99.999%)) and ferric chloride (FeCl₃, anhydrous pure AR (98%)) were obtained from Alfa Aesar; Copper foils (the thickness is 25 μm 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 CuCl₂ solution were prepared by dissolving 1 mmol CuCl₂ powder in 10 ml of water (~0.1 M), 10 ml of ethanol, and/or 10 ml of ethanol-water (v:v, 1:1). In the cases with ferric ions (Fe³⁺), the FeCl₃ was introduced and the molar ratio of Fe³⁺ (from FeCl₃) to Cu²⁺ (from CuCl₂) 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 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.