Photoluminescence properties of cuprous phosphide prepared through phosphating copper with a native oxide layer

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Supporting Information

Sample preparation method for cross section morphology test.

The cuprous phosphide film grown on the copper substrate at 300 ℃ was cut by scissors to leave fresh cross section. During the cutting process, cuprous phosphide is stripped from the surface of copper substrate, and the stripped cuprous phosphide is sticked to the SEM test platform with conductive adhensive for characterization.

The cross-section morphology of cuprous phosphide film is shown in Fig. S1. The typical thickness of the film is ca. 2.7 μm.

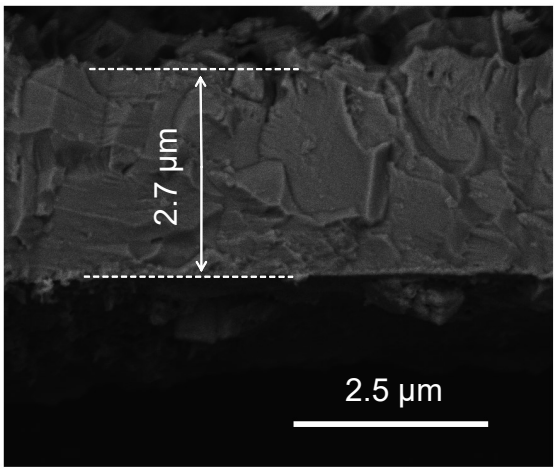

Fig.S1 The cross-section morphology of the cuprous phosphide film.

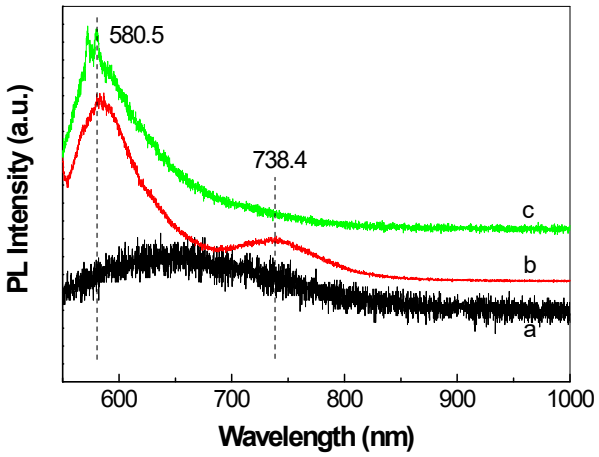

Fig. S2 Photoluminescence spectra of Cu_3P annealed at (a) 600 ºC, (b) 700 ºC, and (c) 800 ºC. Curve (a) and (c) were magnified 12.5 times and 5 times for clarity, respectively. The peaks at 580.5 and 738.4 are due to Cu_2O and Cu_3P, respectively.

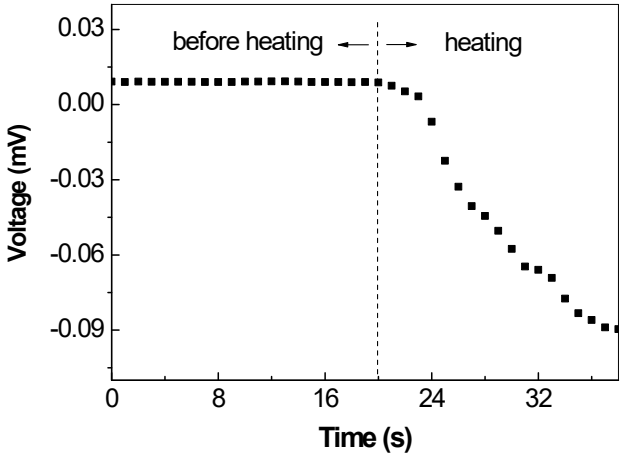

Fig. S3 Hot-probe characteristic for p-type Cu_3P.