Supporting Information

Controllable Synthesis of Three Dimensional Electrodeposited Co-P Nanospheres Arrays as Efficient Electrocatalyst for Overall Water Splitting

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The electrodeposition curve of Co-P is exhibited in Fig. S1. The electrodeposition electrolyte is composed of 50 mM $CoCl_2$ $6H_2O$, 0.5 M NaH_2PO_4 H_2O and 0.1 M NaOAc. A CV technique was applied, with the potential region from -0.3 V to -1.0 V vs. Ag/AgCl. CV cycles are 15 and the scan rate is 30 mV s^{-1}. The electrodeposition mechanism of the Co-P film is as follows: $H_2PO_2^- + Co^{2+} + 3\ e^- = Co\text{-}P + 2\ OH^-$. And the photograph of the obtained Co-P film is shown in Fig. S2. The left sample is the electrodeposited Co-P/FTO and the right is the blank FTO. It can be clearly seen that after electrodeposition, black coverage Co-P film was grown on the transparent FTO.

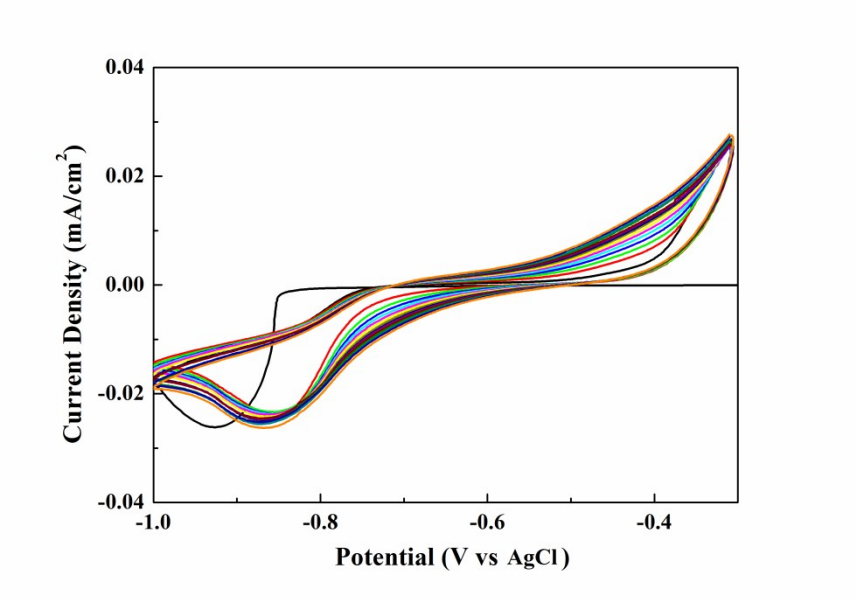

Fig. S1. Cyclic voltammograms during the deposition of the Co-P film using the potential cycling method.

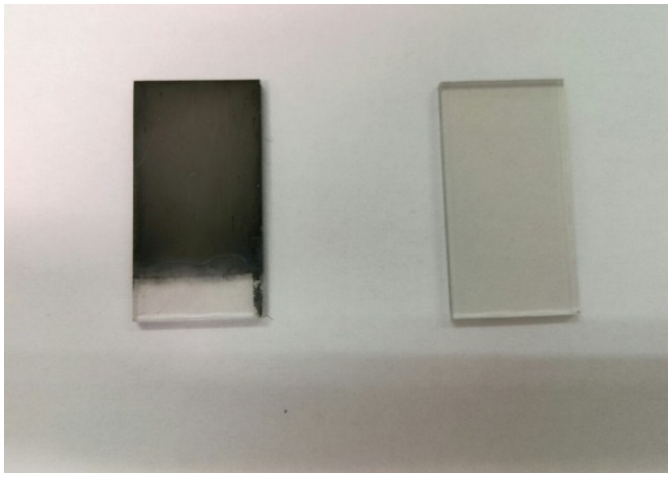

Fig. S2. Photographs of the Co-P/FTO (left) and blank FTO (right)