

Supporting Information: Captions of Figures

Fig. S1 (a) Cyclic voltammetry at a scan rate of 50 mV/s and (b) chronoamperometry at -0.6 V (vs. Ag/AgCl) for 500s on an ITO substrate in a 10 mM $\text{Pb}(\text{CH}_3\text{COO})_2 \cdot 3\text{H}_2\text{O}$ with 0.5 M HClO_4 solution at room temperature. The inset shows the corresponding SEM image of octahedral Pb.

Fig. S2 (a) Optical images of floating Pb nanoparticles and (b) the formation of a network during their colloidal motions on water-nitrogen interface at step (ii) in Scheme 1. When oxygen was supplied to the Pb network, Pb nanoparticles were oxidized to PbO nanoplatelets in process of time with (c) 1, (d) 3, and (e, f) 5 min, respectively.

Fig. S3 (a) The growth of PbO nanowires in water observed with an optical microscope and (b) an example of the junction of two PbO nanowires originated from ca. 200 nm sized Pb nanoparticle analyzed by SEM. PbO nanowires grow downward into water from buoyant Pb nanoparticle instead of oxygen abundant upward.

Fig. S4 (a) The SEM image of octahedral Pb when electrodeposited Pb dried immediately with hot air, and (b) the growth of Pb nanoparticles on octahedral Pb surface in few minutes under nitrogen. (c) Electrodeposited Pb in water and (d) the growth of large PbO platelets on Pb grains in 10 minutes when oxygen is diffused. The overgrowth of PbO platelets from bottom in (e) and (f).

Fig. S5 Linear sweep voltammetry of PbO platelets grown on an ITO substrate in deaerated 0.1 M KHCO_3 solution with a scan rate of 10 mV/s. Bold line is of ITO substrate, and dash line is of PbO platelets. PbO platelets reduced under -0.75 V to cubical Pb and ITO substrate reduced under

-1.2 V to β -In₃Sn, respectively.

Fig. S6 (a) XRD pattern and SEM image when isopropyl alcohol (IPA) was applied instead of water, and (b) when inert (i.e. N₂) and stable (i.e. CO₂) gases were applied instead of oxygen in water. Each diffraction peaks in XRD indicates the orientations of Pb cubic and the substrate (ITO), and no change of electrodeposited Pb was observed from SEM analysis.

Fig. S7 SEM images of PbO composites on ITO substrate. Pb was electrodeposited at -0.6 V for 500s in a 10 mM Pb(CH₃COO)₂·3H₂O with different concentrations of supporting electrolyte; (a) 1, (b) 10, (c) 50, (d) 100, (e) 1000, and (f) 2000 mM HClO₄ solution, and dried under air at room temperature.

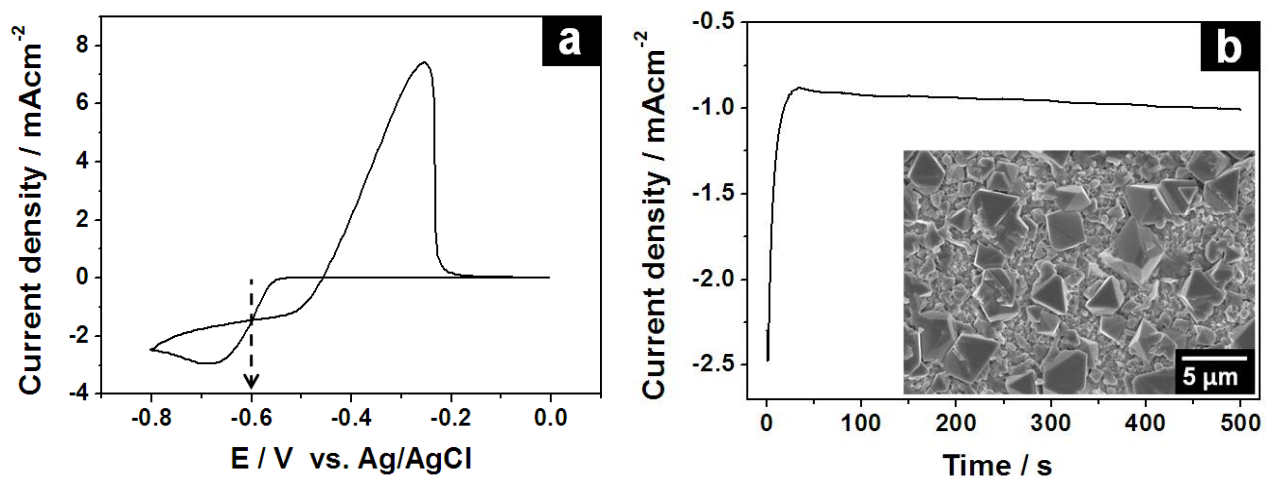


Fig. S1 Y. Kwon et al.

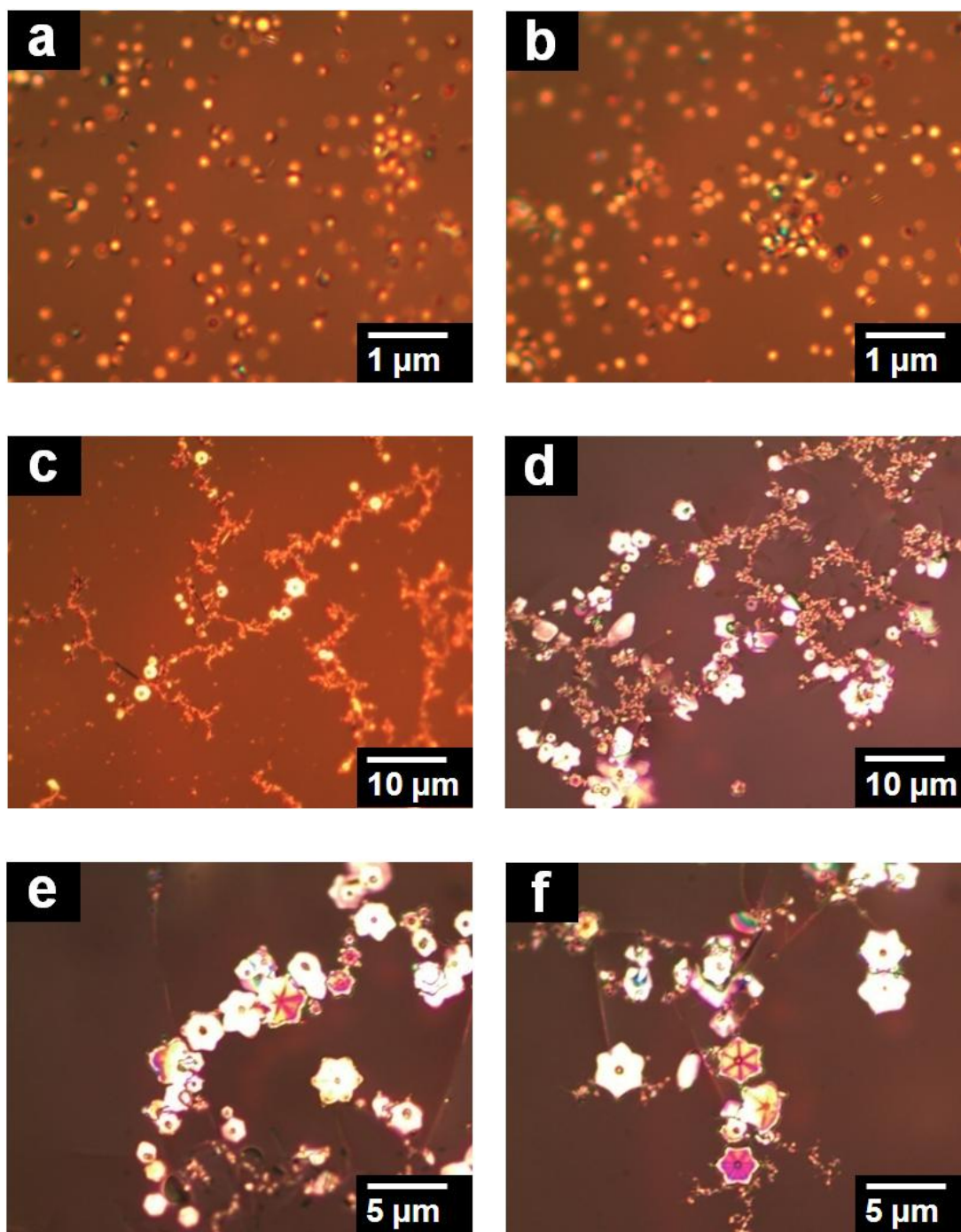


Fig. S2 Y. Kwon et al.

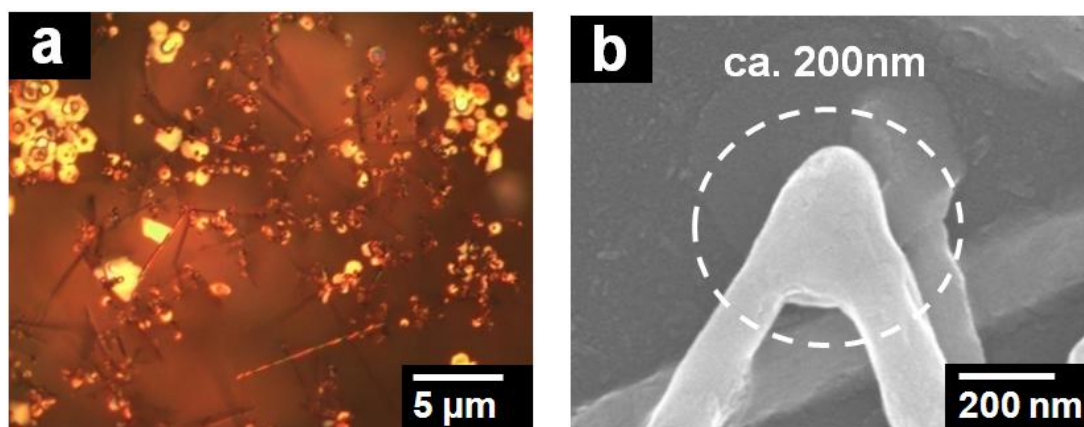


Fig. S3 Y. Kwon et al.

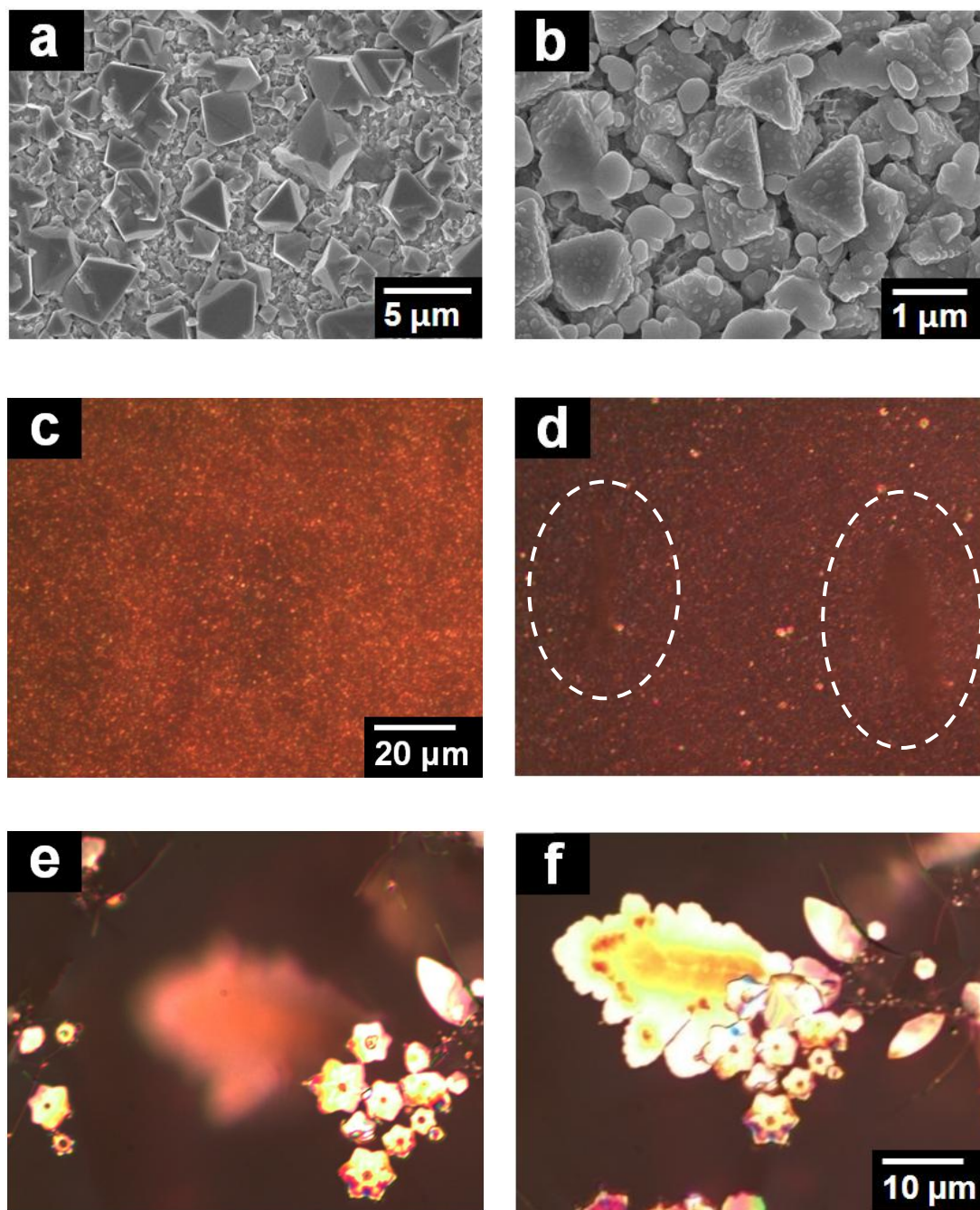


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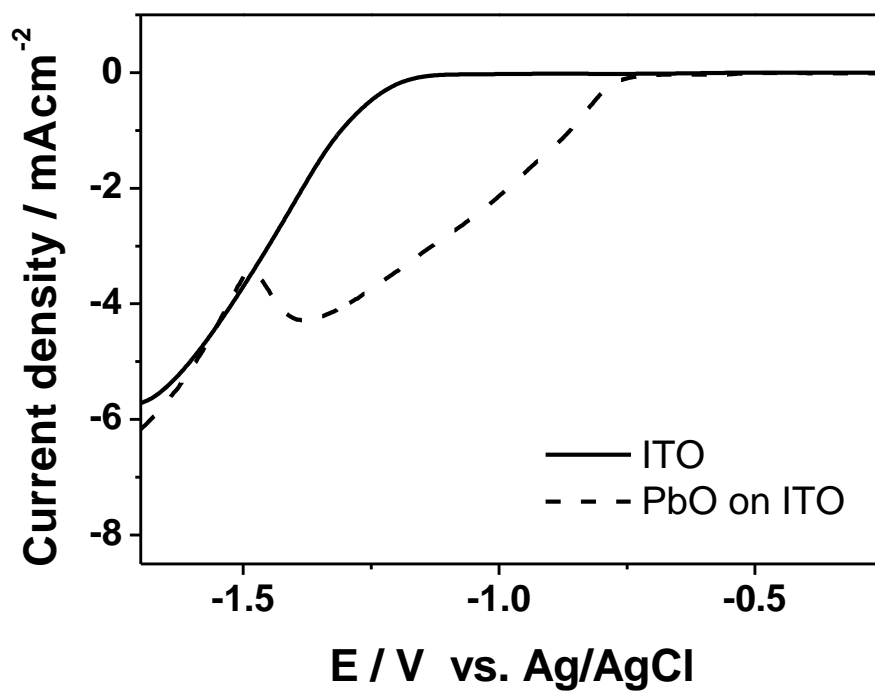


Fig. S5 Y. Kwon et al.

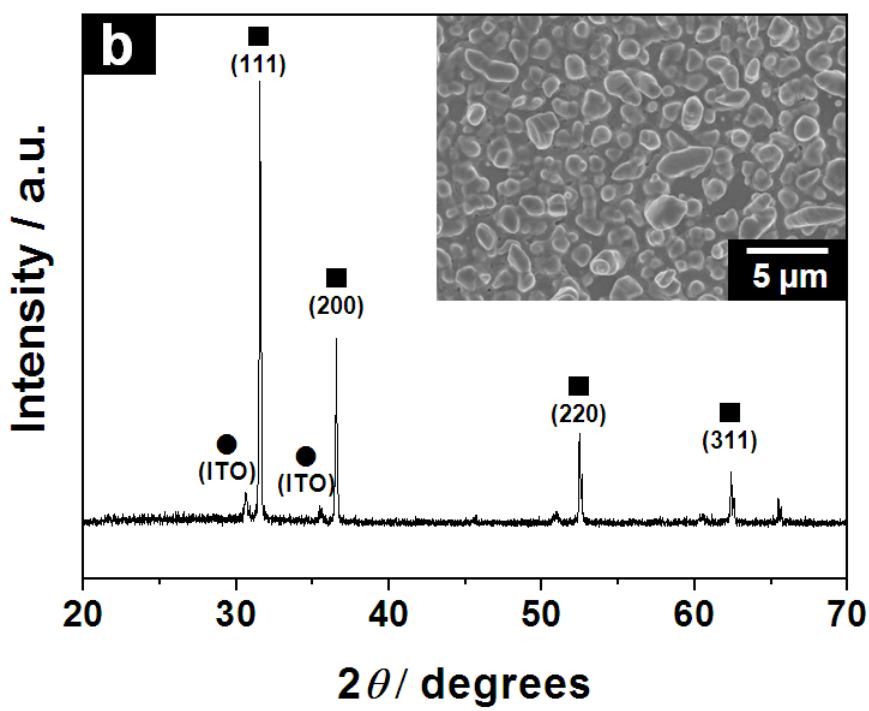
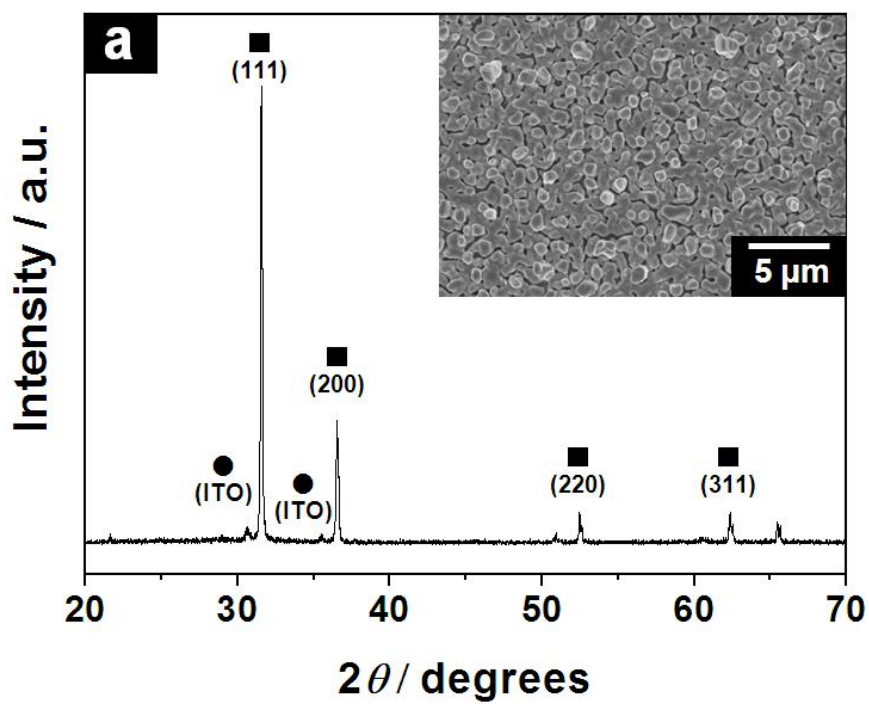


Fig. S6 Y. Kwon et al.

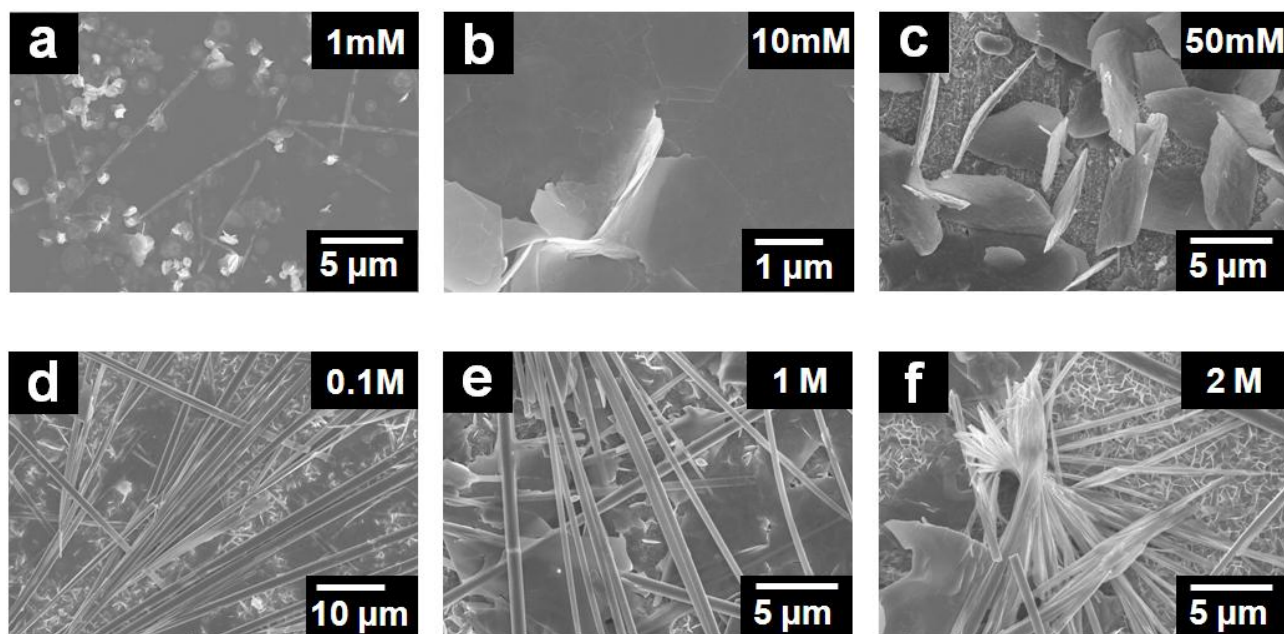


Fig. S7 Y. Kwon et al.