

Supporting Information

Direct Formation of a Water Oxidation Catalyst from Thin-Film Cobalt

Elizabeth R. Young,^a Daniel G. Nocera^b and Vladimir Bulović^a

^a *Organic and Nanostructured Electronics Laboratory, Department of Electrical Engineering and Computer Science, 13-3138, Massachusetts Institute of Technology, Cambridge, MA 02139 and* ^b *Department of Chemistry, 6-335, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA, 02139-4307* E-mail:

E-mail: bulovic@mit.edu, nocera@mit.edu

<i>Index</i>	<i>Page</i>
Experimental set-up	S2
AFM images of Co-Pi catalyst films	S3
SEM images of Co-Pi catalyst films	S4

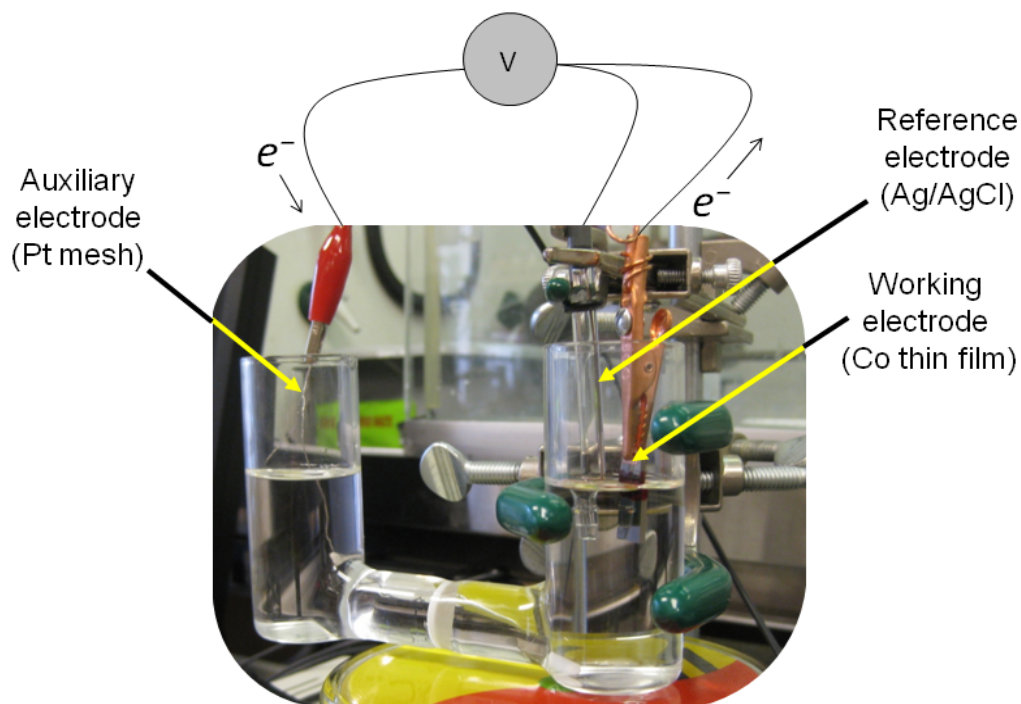


Figure S1. Electrochemical cell utilized for formation and electrochemical characterization of the Co-Pi catalyst. The two compartment cell is separated by a white semi-permeable frit located in the middle of the H-shaped cell. The anodic reaction occurs on the right side of the cell. The working electrode is either the Co thin-film electrode or an FTO-coated glass electrode. The Ag/AgCl reference electrode is positioned in close proximity to the working electrode. The cathodic reaction occurs on the right side of the cell shown here. The auxiliary (or counter) electrode is a platinum mesh connected to a platinum wire. The Pt mesh allows high passage of current ensuring that the cathodic reaction will not impose current limitations on the functioning of the electrochemical cell. A potentiostat (represented as “V”) is utilized to drive the electrochemical cell and record current and charge passed during operation.

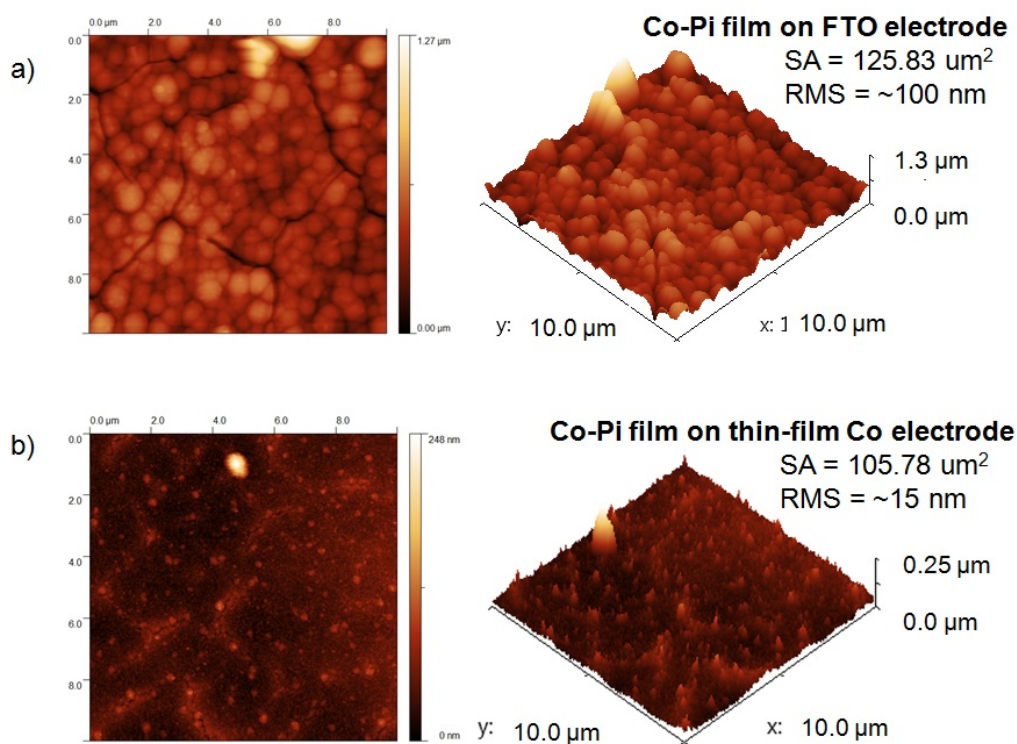


Figure S2. AFM images are used to quantify the height profiles of the two Co-Pi films. a) The Co-Pi film formed on FTO electrodes from the all-solution deposition method. b) The Co-Pi film formed on the thin-film cobalt electrodes with only 0.1 M KPi buffer. The Co-Pi films formed on the thin-film cobalt electrodes are significantly smoother with 16% less surface area (SA) than the Co-Pi films formed on FTO electrodes when measured over the same 1 μm^2 substrate area. Note the different y-axis scales of the two AFM images.

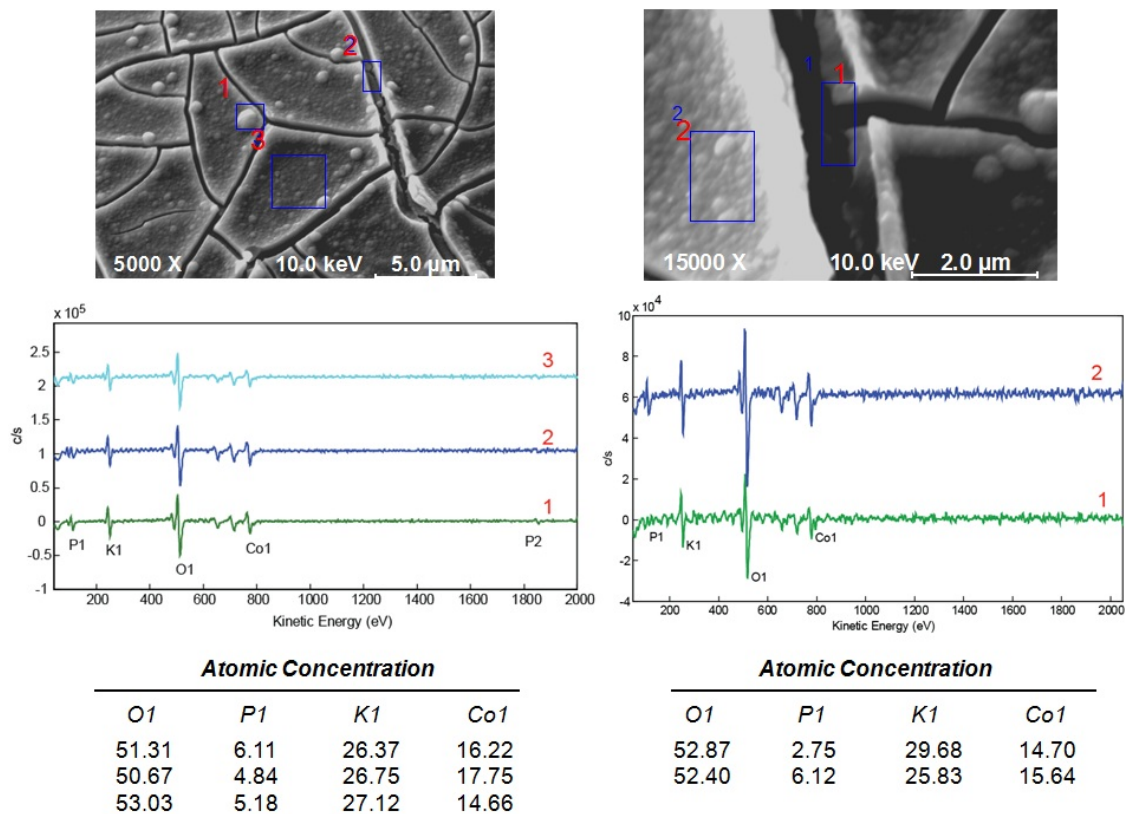


Figure S3. Additional SEM images and Auger atomic concentration analysis for Co-Pi formed on cobalt thin-film electrodes