A Study on Robust VO_2 Protection Layer and Defect Inactivation in $BiVO_4$ Photoelectrodes through Photoelectrochemically Transition-Metal Engineering

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Supplemental document

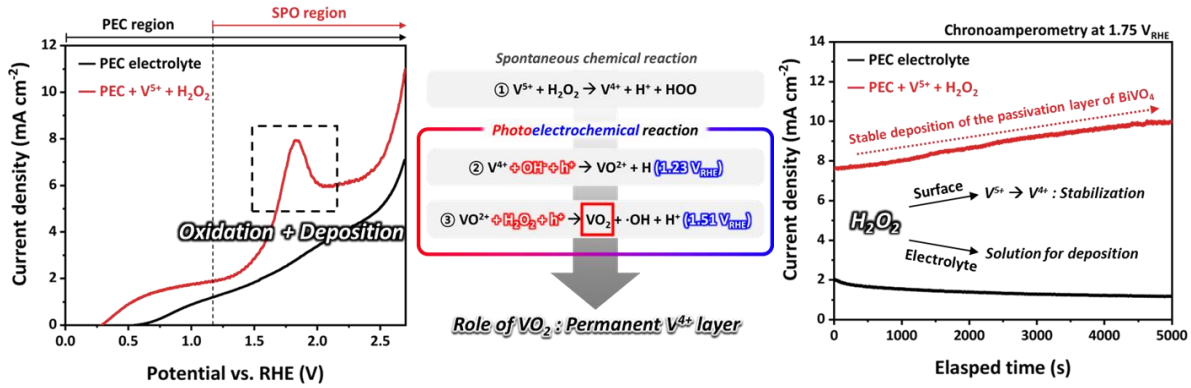

Figure 1. A spontaneous reaction is utilized by adding both V^{5+} and H_2O_2 to the electrolyte. It suppresses the precipitation of V^{5+} and simultaneously proceeds with surface oxidation and growth of a new surface layer.

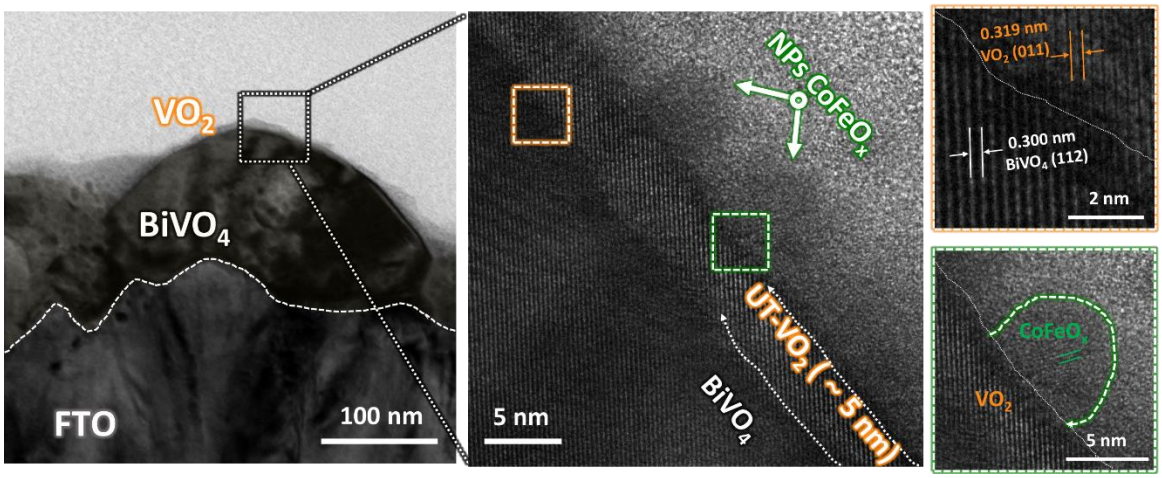

Figure 2. HR-TEM images of the $BiVO_4/VO_2/CoFeO_x$ photoanode obtained at an accelerating voltage of 200 keV. (a) Cross-sectional image of the photoanode in the form of an ultra-thin film over 100 nm on the FTO Substrate. (b), (c), and (d) HRTEM images of the photoanode.

Keyword: Electrochemistry, Bismuth vanadate, Ultra-thin film, Photoelectrochemical-oxidation, Surface treatment