Supporting Information

Inserting Co and P into MoS_2 Photocathodes: Enhancing Hydrogen Evolution Reaction Catalytic Performance by Activating Edges and Basal Planes with Sulfur Vacancies

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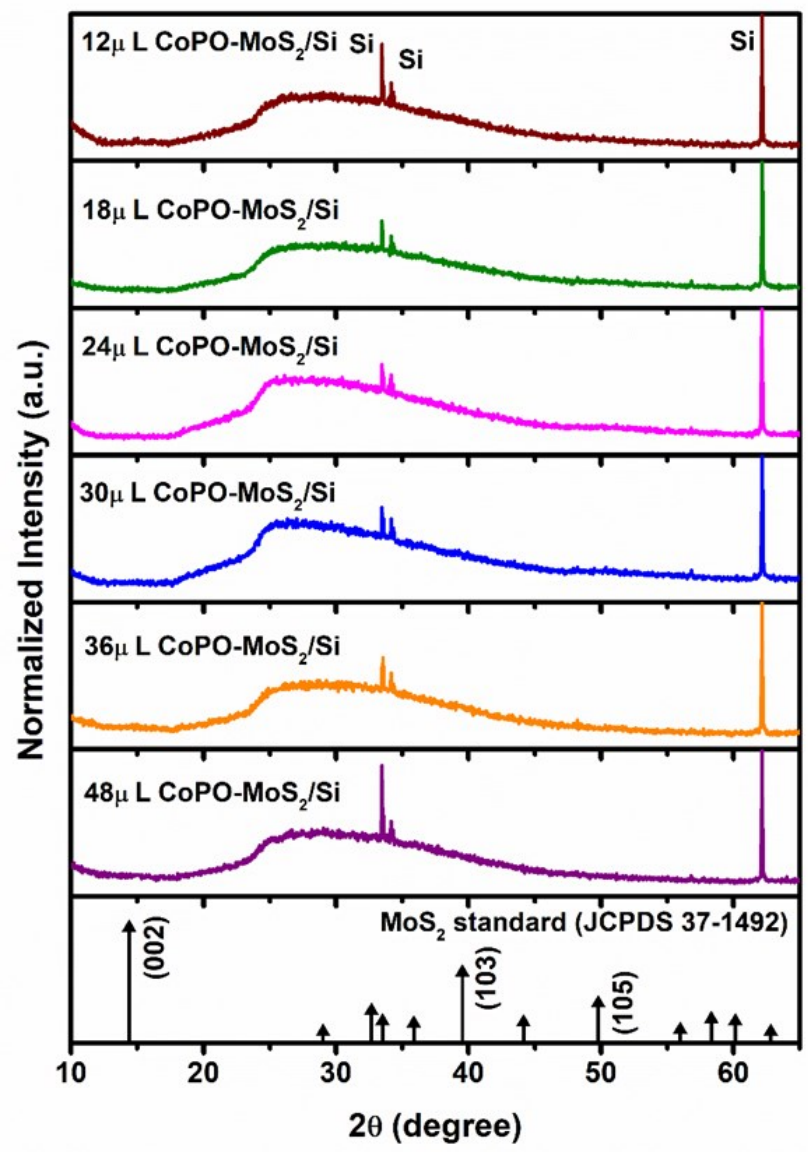

Figure S1. X-ray diffraction patterns of CoPO–MoS_2/Si materials after annealing after different loading of precursor solution.

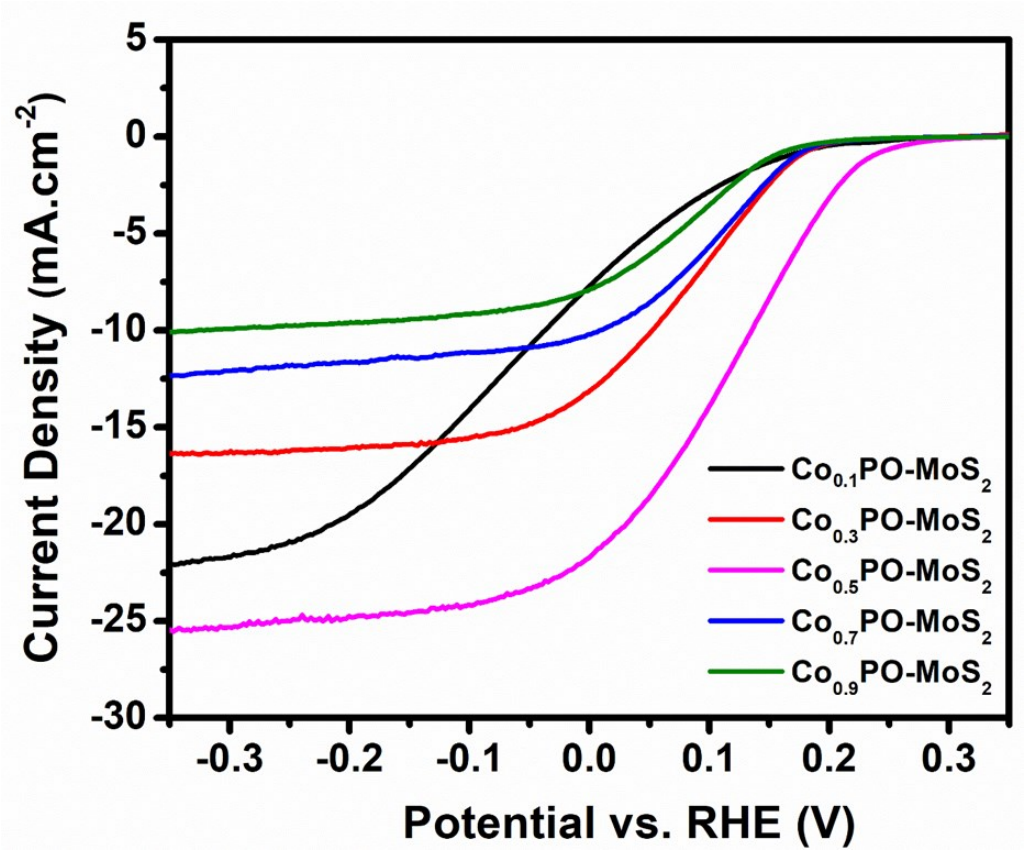

Figure S2. Linear sweep voltammograms of CoPO–MoS_2/Si photocathodes using different ratio of Co under solar illumination

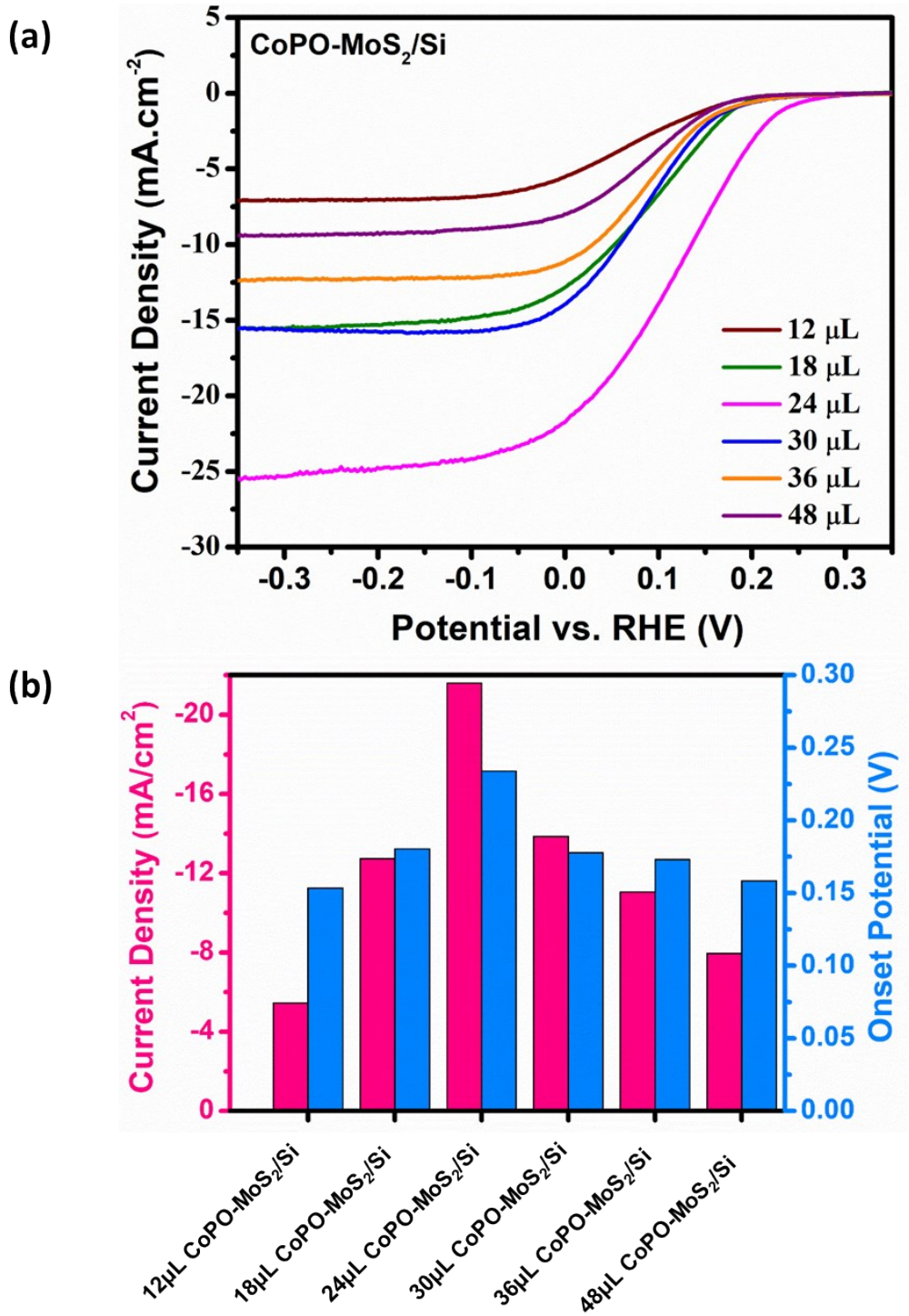

Figure S3. (a) Linear sweep voltammograms of CoPO–MoS_2/Si photocathodes using different loading amounts under solar illumination, (b) Current density at 0 V (vs. RHE) and onset potential of photocathode materials.

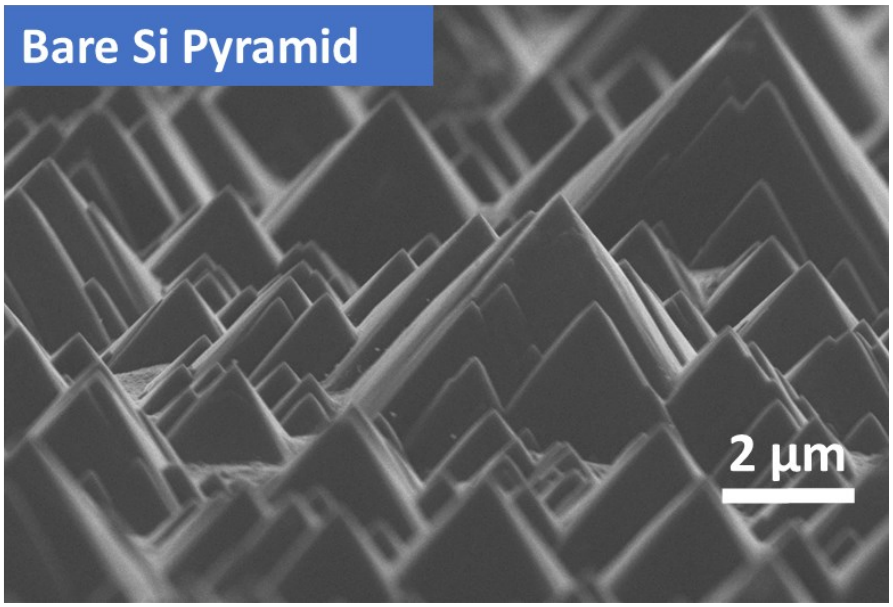

Figure S4. Scanning electron microscope image of bare SiMPs arrays.

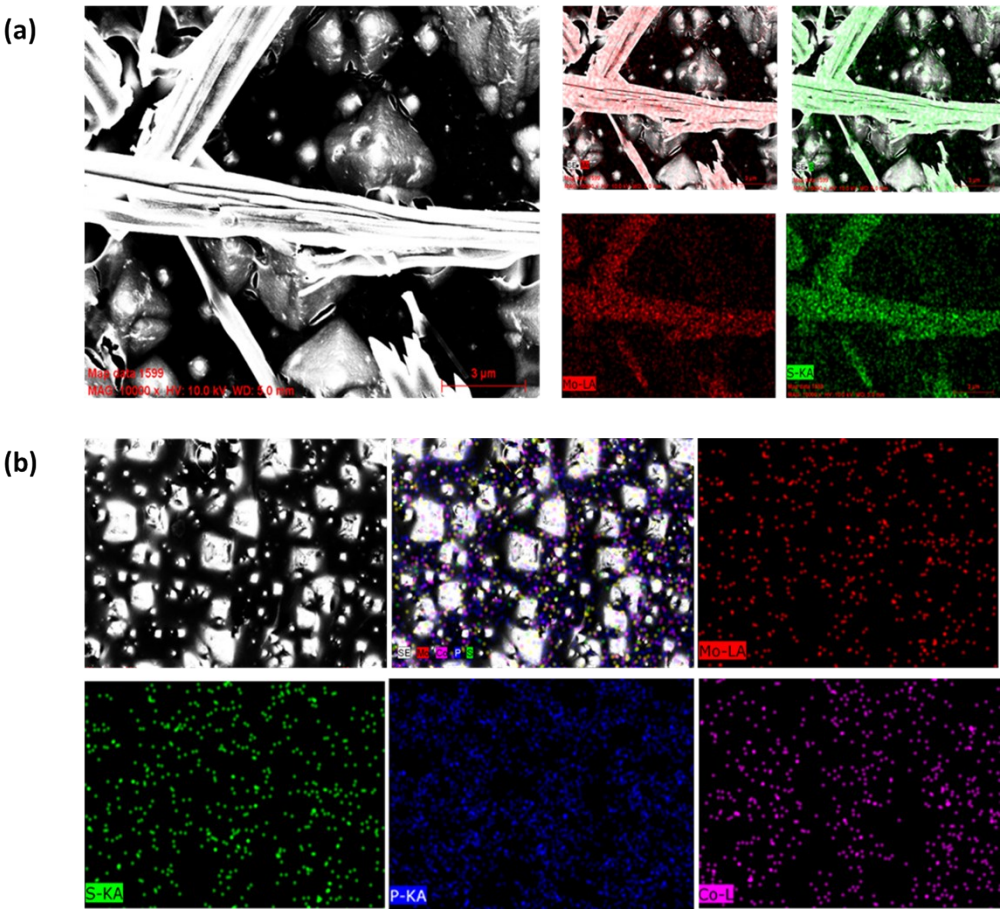

Figure S5. Energy dispersive X-ray spectroscopy images of (a) Bare MoS_2/Si and (b) Drop-casted CoPO–MoS_2/Si photocathodes.

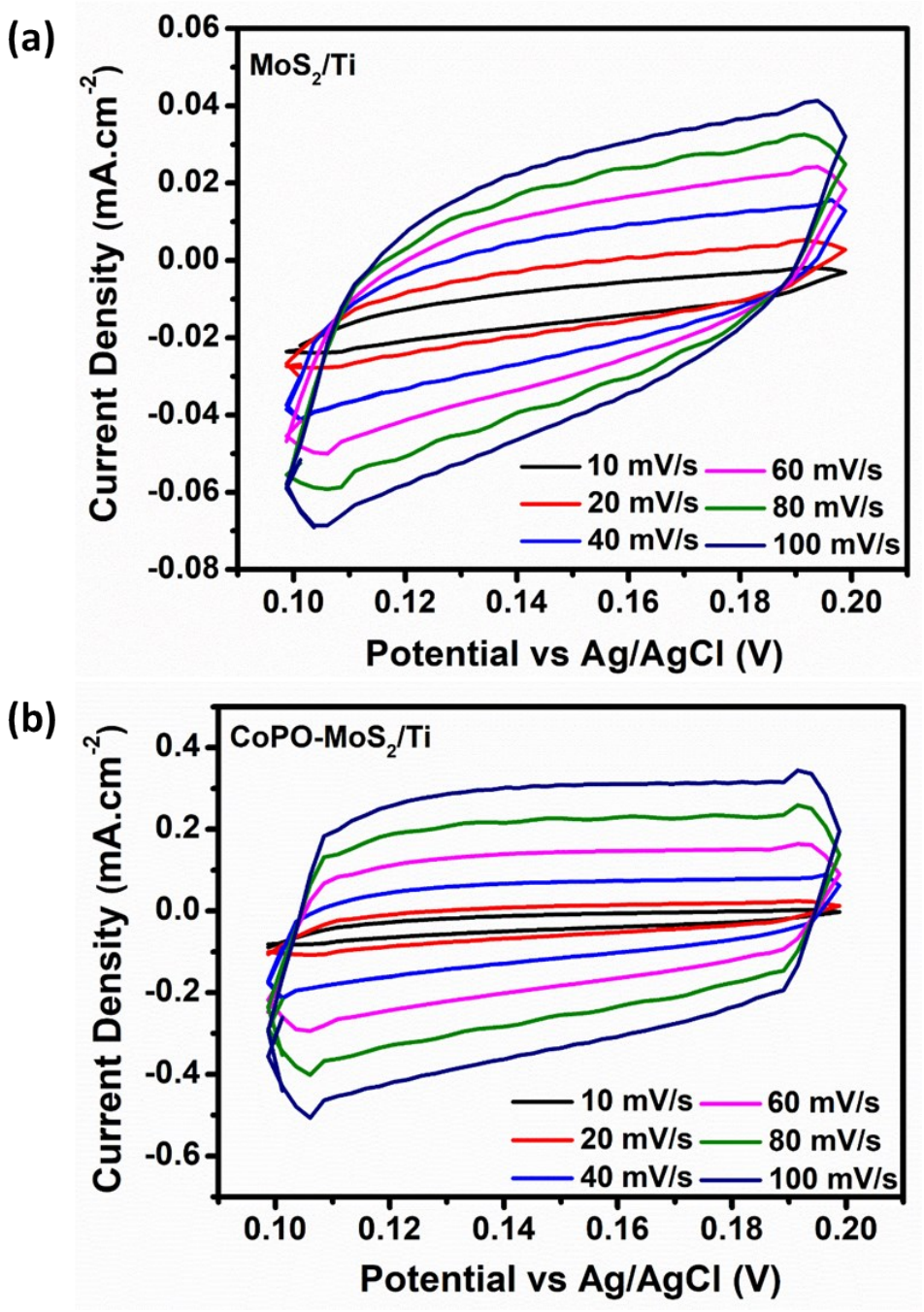

Figure S6. Cyclic voltammograms of (a) bare MoS_2/Ti and (b) CoPO–MoS_2/Ti recorded between 0.1 and 0.2 V (vs. RHE) at various scan rates in 0.5 M H_2SO_4 electrolyte.

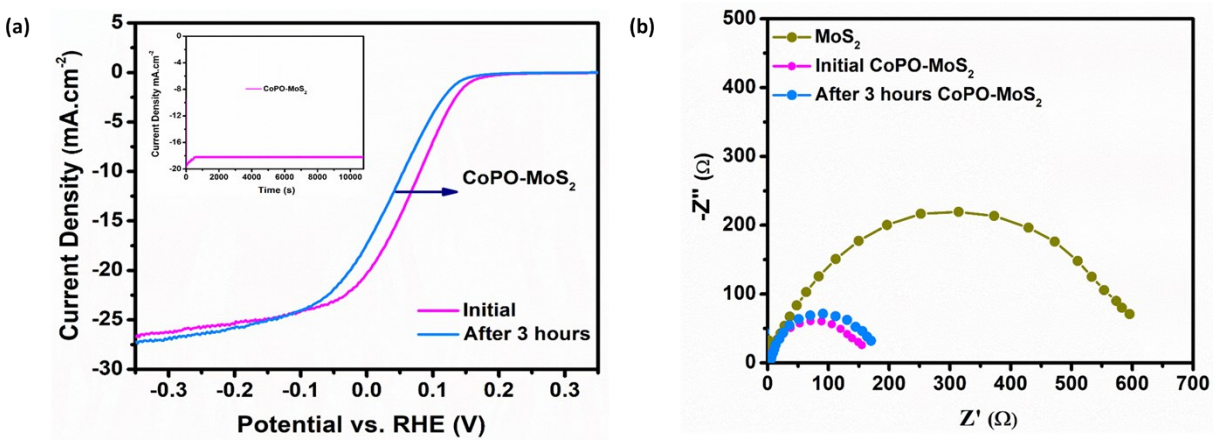

Figure S7. (a) Stability (b) Impedance for CoPO-MoS_2 in 0.5 M H_2SO_4 electrolyte.

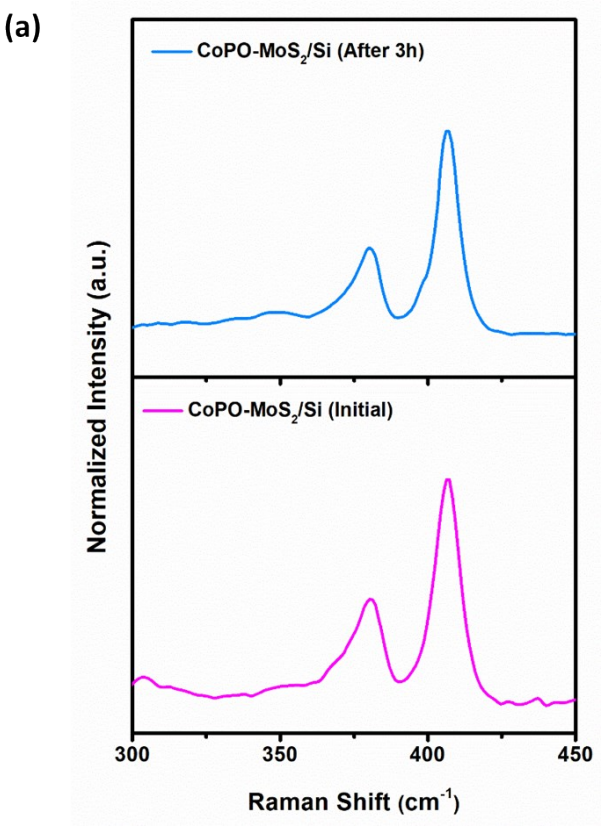

Figure S8. (a) Raman spectroscopy for initial and after 3 hours stability.

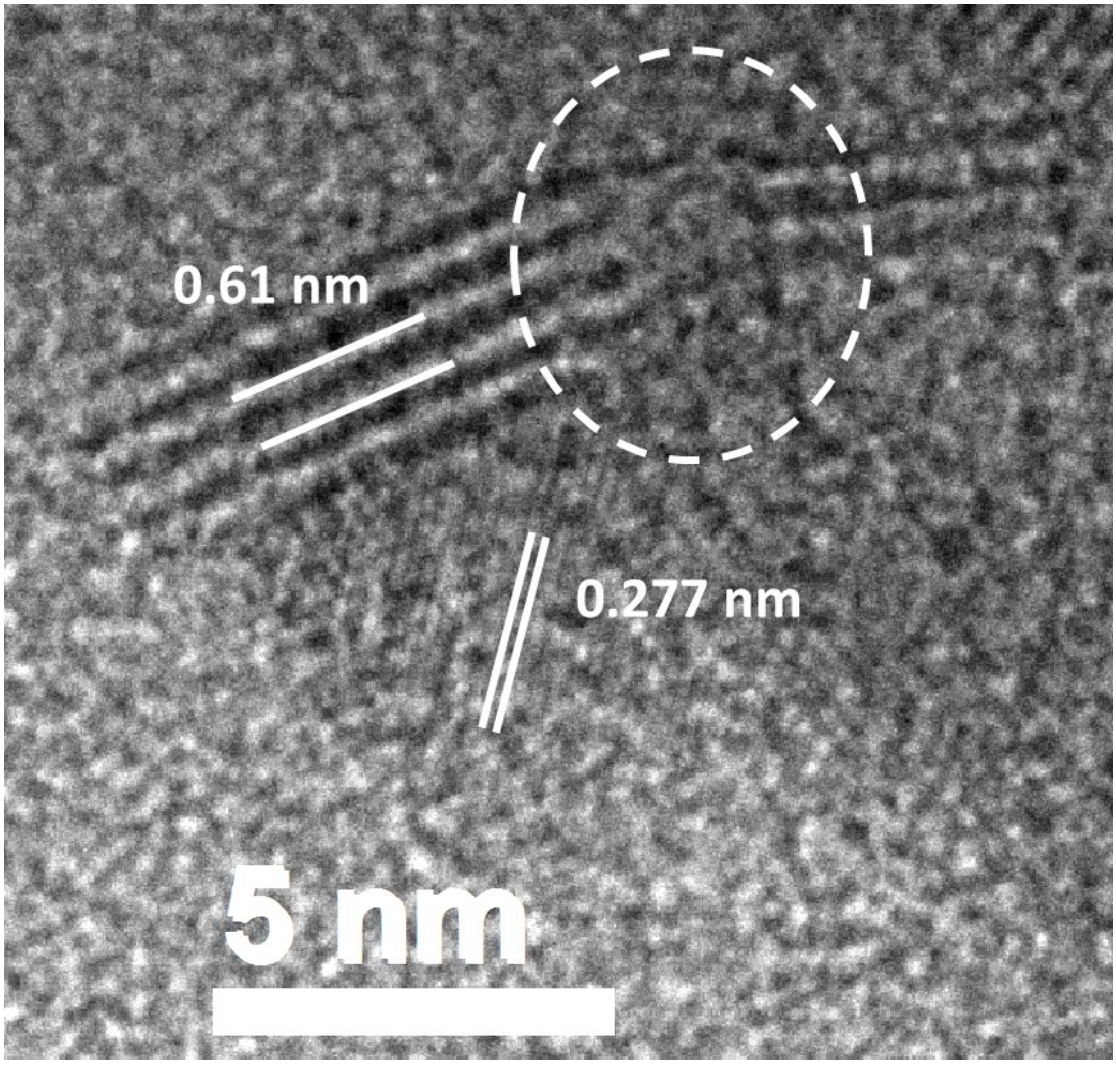

Figure S9. HRTEM image of CoPO-MoS_2 indicating presence of defects