

## A Comparison of the Electrodeposition of Sn and In for Photovoltaic Components

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Cu-In-Ga-Se (CIGS) and Cu-In-S (CIS) are photovoltaic absorber materials that can be fabricated by electrodeposition, and are commercially of interest for solar panels. A problematic limitation is the In component that is costly and is not an abundant resource. Replacing all or part of the indium with Sn may be one alternative to reduce the need for indium. The In was electrodeposited with and without Sn, in a room temperature, aqueous electrolyte, which showed that the rates of Sn and In are enhanced when they are co-deposited from the same electrolyte. Also using Cu in the solution rather than the substrate enhanced the rate for In, but only when Sn is present, suggesting a coupled reaction mechanism. Future work will focus on identifying the nature of the change in the reaction rates and codepositing indium and tin to ultimately create CI-Sn-S and CI-Sn-GS systems, to reduce the amount of indium needed.