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Properties of Electrodeposited Metal Sulfide Films for photovoltaic applications PAWANJIT KAUR, MAGGIE PAULOSE, OOMMAN VARGHESE, Univ of Houston — Binary, ternary and quaternary metal sulfide films are of considerable interest as components in solar cells. Some of these materials are earth abundant and have the potential to yield low cost devices. Among these materials, $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) and its variant $\text{Cu}_2\text{ZnSnS}_x\text{Se}_{1-x}$ (CZTSSe) have shown promising properties as light absorbers. Efficiencies exceeding 12% were reported in devices employing CZTSSe as light absorber. Nevertheless, fabrication of these materials without secondary phases such as ZnS is a major problem. In order to minimize the challenges associated with such quaternary materials, we reduced the number of elements and fabricated ternary metal sulfides using electrodeposition, which is a scalable technique. We will discuss the promising properties of these materials as light absorbers in solar cells.

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