

According to the International Energy Agency (IEA), solar energy is set to lead the charge of clean energy over the next 30 years.[1] This growth will increase demand for cost-effective photovoltaic technology, making the research in this field essential. Tandem solar Cells are a relatively new approach to enhancing the efficiencies of low-cost solar cells. CuInS₂ thin films are ideal for tandem solar cells with silicon due to their band gap (1.5 eV), high absorption coefficient, relatively low cost, and ease of fabrication when electrodeposited. Electrodeposition can be performed at standard temperatures and pressures. This method of fabrication also enables the recycling of waste chemicals, improving the environmental and economic viability of this process. As a first step in developing a CuInS₂/Si tandem cell, thin films of CuInSe₂ and CuInS₂ were successfully formed directly onto etched Si(111) wafers by electrochemical and annealing methods. The resulting CuInS₂ /Si samples were characterized by scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), and X-ray Diffraction (XRD). These early results may provide a path forward for the future development of low-cost Si-based tandem solar cells.