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Impact of Film Crystallinity on Organic Photovoltaic Cell Performance

Research in photovoltaic technology is a promising line of work in the search for renewable, sustainable, and environmentally-friendly sources of energy. A relatively new division of this important field is that involving creation of solar cells out of thin films of small molecular weight organic materials. These materials are specially chosen to absorb light, and the device design utilizes differences in molecular properties between the materials to effectively push electrons to wire contacts, forming an electrical current. These cells have the advantage of being more inexpensive, more flexible, and more lightweight than their conventional crystalline silicon counterparts, but are not currently produced due to their comparably low efficiencies. This work examines the impact of film growth conditions (such as rate, temperature, and component materials) on film morphology and solar cell performance. The overall goal of this research is thus to improve molecular order for enhanced charge and energy transport within the film, which will in turn improve device efficiency and make these cells more competitive as source of renewable energy.



Poster Number: Session: