

### Synthesis and Characterization of Mesoporous materials for Hybrid Solar Cell

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In recent years, conjugated polymer-inorganic semiconductor hybrid systems have attracted extensive attention and research. Because, conjugated polymer, when self-organized into crystal structure, can own a high hole mobility, and can also be easily processed onto the surfaces of both rigid and flexible substrates. Generally when organic and inorganic components are combined into a heterojunction device, the polymers are used as donors to absorb sunlight and transport holes, while the inorganic semiconductors function as acceptors to transport electrons. Inorganic semiconductor based on CdS, CdSe, CdTe, ZnO, SnO<sub>2</sub>, TiO<sub>2</sub>, Si, PbS, PbSe, CuInS<sub>2</sub>, CuInSe<sub>2</sub> have been used so far as electron acceptors. Organic-inorganic Hybrid solar cells have recently achieved energy conversion efficiency exceeding 6.0%. In general, polymer-inorganic semiconductor hybrid solar cells can be fabricated in three configurations of a planar bilayer hybrid solar cell, a randomly mixed bulk heterojunction hybrid solar cell and an ordered heterojunction hybrid solar cell.