

The photoelectric responses of electrodeposited C60 films on nanocrystalline TiO₂ with positive hole collecting CuSCN

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Thin films of C₆₀ were electrodeposited on TiO₂ electrodes. All solid-state photovoltaic devices were fabricated comprising above C₆₀ films with hole conducting inorganic semiconductor CuSCN and studied their characteristics. The cell delivered a short circuit photo current of ~ 225 $\mu\text{A cm}^{-2}$ with an open circuit voltage of ~ 350 mV under the irradiance of 260 W cm^{-2} . The charge transferring mechanism is described as the formation of C₆₀ radicals from the excited C₆₀ molecules due to the electron injection from CNS⁻ ions and emission of electrons from the C₆₀ radicals to the conduction band of the TiO₂. These devices show remarkable stability with reproducible performances for future electrical and electronic applications.