

Interactions Between Photoinduced and Dark Charge Transfer across n-TiO₂-Aqueous Electrolyte Interface

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ABSTRACT

An intermediate of the dark reductive reaction of n-TiO₂ with an aqueous electrolyte was identified. This intermediate forms surface states on the semiconductor. The energy and surface concentration of these states were evaluated by impedance measurements. We report on sub-bandgap photoresponse due to excitation of electrons from the valence band to these states. The potential-photocurrent behavior of these states is unique and is being fully accounted for by the proposed mechanism of their dynamic formation and annihilation.