E2-19 Photodegradation of pigments coated on nano-porous TiO_2 films

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The dye sensitized NDP-photovoltaic solar cell (n-type) semiconductor/dye/p-type semiconductor) fabricated by depositing CuI onto the cyanidin adsorbed on nano-porous n-TiO_2 film (deposited on conducting tin oxide glass) was found to deliver a high photocurrent in sunlight. However, the main factor limiting the efficiency of this dye sensitized photovoltaic cell is the decay in photocurrent owing to the photodegradation of the pigment. Attention was therefore focused on the factors that determine the rate of degradation of the pigment. To examine this, the pigment, cyanidin adsorbed on nano-porous n-TiO_2 film which was deposited on conducting tin oxide glass, was illuminated with different sources of light under different experimental conditions.

The absorption spectrum for the pigment was measured as a function of time. It was found that the degradation of the pigment could be completely prevented, when the presence of moisture and oxygen is excluded.