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Visible light absorption and photodarkening in Te-modified TiO₂ nanocrystals STEVEN PHILLIPS, IAN JAMES, BRET HESS, Brigham Young University — Applications of titanium dioxide nanocrystals in solar cells and solar photocatalysis are limited by the lack of visible light absorption. We have created TiO₂ nanocrystals modified by tellurium, which causes absorption in the visible. In TiO₂:Te nanocrystals annealed between 300 and 600 C, light exposure quickly causes the visible absorption to increase until the sample is reddish-brown. The presence of Te stabilizes the anatase structure, while the rutile phase is found in undoped nanocrystals. We discuss possible mechanisms for the photosensitivity, and explore whether this visible absorption is useful in photocatalysis.

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