

Editorial

Doped TiO₂ Nanomaterials and Applications

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Received 16 July 2008; Accepted 16 July 2008

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This special issue briefly reviews some trends and factors that have impacted heterogeneous photocatalysis with next generation TiO₂ nanophotocatalysts that could absorb and make use of both UV (290–400 nm) and visible (400–700 nm) sunlight to enhance process efficiencies, along with some issues of current debate in the fundamental understanding of the science that underpins the field. Preparative methods and some characteristic features of doped TiO₂ as well as its environmental applications are presented and described. The next generation of doped TiO₂ photocatalysts should enhance overall process photoefficiencies in many cases, since doped TiO₂s absorb a greater quantity of solar radiation. The fundamental science that underpins heterogeneous photocatalysis with the next generation of photocatalysts is a rich playing field ripe for further exploration.

Different articles presented in this special issue have shown that modification of TiO₂ by doping of different atoms, both as cations and anions, can improve photoactivity of TiO₂. One reason is slowing down electron/hole recombination rate. The presence of certain dopants can increase the concentration of organic pollutants on the surface of TiO₂ facilitating the contact of the light-generated reactive species with the organic molecules. Doped TiO₂ can extend the absorption of the light to the visible region and makes the photocatalysts active under visible-light irradiation.

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