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Editorial
Doped TiO_2 Nanomaterials and Applications

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This special issue brieflyreviews some trends and factors that have impacted heterogeneous photocatalysis with next generation TiO_2 nanophotocatalysts that could absorband 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 characteristics features of doped TiO_2 as well as its environmental applications are presented and described. The next generation of doped TiO_2 photocatalysts should enhance overall process photoefficiencies in many cases, since doped TiO_2s 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 TiO_2 by doping of different atoms, both as cations and anions, can improve photoactivity of TiO_2. 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 TiO_2 facilitating the contact of the light-generated reactive species with the organic molecules. Doped TiO_2 can extend the absorption of the light to the visible region and makes the photocatalysts active under visible-light irradiation.

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