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Special Issue Reprint

Emerging Trends in TiO_2 Photocatalysis and Applications

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The semiconductor titanium dioxide (TiO2) has been evolved as a prototypical material to understand the photocatalytic process, and has been demonstrated for various photocatalytic applications such as pollutants degradation, water splitting, heavy metal reduction, CO2 conversion, N2 fixation, bacterial disinfection, etc. Rigorous photocatalytic studies on TiO2 have paved the way to understanding the various chemical processes involved and the physical parameters (optical and electrical) required to design and construct diverse photocatalytic systems. Accordingly, it has been realized that an effective photocatalyst should have ideal band edge potential, narrow band gap energy, reduced charge recombination, enhanced charge separation, improved interfacial charge transfer, surface-rich catalytic sites, etc. As a result, many strategies have been developed to design a variety of photocatalytic systems, which include doping, composite formation, sensitization, co-catalyst loading, etc. Towards highlighting the above-mentioned diversities in TiO2 photocatalysis, there have been many interesting original research works on TiO2, involving material designs for various photocatalytic applications published in this Special Issue. In addition, some excellent review papers have also been published in this Special Issue, focusing on the various TiO2-based photocatalytic systems and their mechanisms and applications.

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