

Effect of doping on the phase transformation in TiO₂ - A Review

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Abstract : Titanium dioxide has tremendous applications in different fields like photocatalyst for water and air purification, gas sensor, polymer industry and many more. Particular application of TiO₂ depends on its specific phase. The commonly occurring phases of TiO₂ are anatase, rutile and brookite. There have been extensively study on the transformation from metastable anatase to rutile depending upon verities of factors like dopants, particle size, synthesis conditions etc. In the present review paper the role of doping on the anatase to rutile phase transformation is discussed. Several authors have demonstrated that the dopants like Mn, Ni, Co, Sn, Fe, Nb, Y, Zn and Cr accelerate the transformation while Al, Si, Zr, Ce, Au, Nb and W retard. The underlying mechanism for this dopant induced transformation however is still not clear. The present review paper thus addresses such issues as the oxygen vacancies, lattice strain, co-ordination number etc. of induced by dopants in the phase transformation process.

Keywords: anatase, rutile, phase transformation, dopants

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