

Investigation of structural and optical properties of Cr doped TiO₂ synthesized at different annealing temperature by analyzing the XRD patterns and DRS spectroscopy

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Abstract: Extension of the optical response with the high efficiency in visible region of the solar light spectrum is one of the research goals of the photocatalysts based on TiO₂. In this work, Cr doped TiO₂ was synthesized by sol-gel method at different annealing temperature of 400, 600 and 800 °C in order to increase the optical absorption of TiO₂. Upon increasing the annealing temperature, the anatase transformed to rutile while the size of the nanoparticles increased. Anatase was often used for investigation of photocatalytic activities and has been introduced as the desired phase of TiO₂ for the photocatalytic applications. According to the observed increase in the optical absorption of the rutile by diffuse reflectance spectroscopy (DRS) and considering the structural properties of rutile, this phase of TiO₂ can also be considered for photocatalytic activities and applications.

Keywords: Cr doped TiO₂, XRD, TEM, Diffuse reflectance spectroscopy.

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