

Abstract Submitted
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The Vibrational and Photoluminescence Properties of TiO₂ Nanoparticles Reacted with Eu³⁺ Ions under Hydrothermal Conditions L. FARRIS, H. YAN, P. MCCART, R. MAYANOVIC, Missouri State University, MISSOURI STATE UNIVERSITY TEAM — TiO₂ has been shown to be an effective material for environmental purification and photocatalysis. The catalytic activity of TiO₂ nanoparticles (NPs) is enhanced due to the increase in the ratio of surface area to volume at the nano-scale. The enhancement of catalytic activity is further increased by the modification of the surface due to the adsorption of transition-metal ions on TiO₂ NPs. The reactivity of Eu³⁺ ions with anatase TiO₂ nanoparticles under various pH and pressure-temperature (P-T) conditions in aqueous fluids has been investigated. A hydrothermal reactor was used to modify the surface of the TiO₂ nanoparticles with Eu³⁺ ions in aqueous fluids at high P-T conditions. The Eu-reacted and untreated TiO₂ NPs were examined using XRD, SEM, and Raman and photoluminescence spectroscopy. The modifications of the vibrational and photoluminescence properties of the TiO₂ NPs due to the surface-adsorption of Eu³⁺ ions are discussed.

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