TiO2/SiO2 Composite for Efficient Protection of UVA and UVB Rays Through of a Solvent-Less Synthesis

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In an effort to discover new inorganic UV absorbers, titania included into silica was prepared using a solvent-less solid state method involving the pyrolysis of the as prepared precursor Chitosan·(TiOSO4)/SiO2, as an alternative and versatile way to using these compounds for practical applications. The new TiO2/SiO2 composite was characterized by PXRD, SEM?EDS, TEM and UV?Vis absorption analysis. The SEM?EDS mapping images show a uniform distribution of TiO2 into the silica matrix. The optical properties of the composite have shown an interesting result related to high absorption of UVB rays and an improved absorption of UVA rays than pure TiO2. Efficient suppression of photocatalytic behavior of TiO2, when is incorporated into silica, was evidenced from 85 to 31%, suggesting it material as alternative inorganic UV absorber to remains the properties of the methylene blue dye. These results reveal their potential use in practical textile industry and UV protection agent to avoid human damage.

Photocatalysis

TiO2/SiO2 composite

UV absorber

UV blocking property