IRON MODIFICATION OF TiO_2

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TiO_2 is a photocatalyst that has many applications particularly in the environmental field. TiO_2 and doped TiO_2 (0.1%, 0.5%, 1%, 2.5% and 5% Fe) with particle sizes ranging from 2-4 nm are synthesized by the inorganic precursor $TiCl_4$. Results from electron paramagnetic resonance suggest that the distribution of iron is on the surface of the doped crystals. Sum frequency generation is used to probe methanol adsorption on these catalysts. The SFG spectra obtained show that the methoxy peak in undoped TiO_2 is suppressed in the doped crystals. These results have great implications in the tailoring of the photocatalyst.