Research of Multi-walled Carbon Nanotube Composites' Photochemical Properties

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In the course of my project, I wanted to examine if impregnating carbon nanotubes with different metal-oxides in a way so that the metal-oxides take their positive effects on nanotube based composites simultaneously is possible. I reached this through impregnating the samples with TiO2, other samples with WO3 and some samples with TiO2 and WO3 metal-oxides at the same time. Based on my measurements, the TiO2 is active, whereas the WO3 is inactive in photochemical aspects, and I examined how large inhibition the WO3 takes on the photocatalytic activity of the TiO2. At first I prepared the composites. I used a basic colloid chemical method, dispergated the carbon nanotube in ethanol and added into the colloid TiO2 or WO3 precursor solution. With a heat treatment at 400ºC the metal-oxides acquired a regular structure on the surfaces of the carbon nanotubes. I ascertained the successfulness of thermal treatment with XRD and TEM, and at last I measured the photocatalytic activity. Dissociated salicylic acid by UV light and from the concentration changes can be stipulated the composite’s photochemical activity. My work was successful because the composites with two metal-oxides was photochemically active and this phenomenon opened new research directions.

Awards Won: