

**Composite films based on TiO₂/Nanocarbon as
absorbing coatings for solar concentrators.**

M.E. Rincón*, David Molina Torres, Camilo Arancibia
Centro de Investigación en Energía-UNAM
Priv. Xochicalco S/N, Temixco, Morelos
62580, México; e-mail: merg@cie.unam.mx
Tel: +52-55 5622 9748, FAX: +52 55 5622 9742

In this work we describe the preparation of composite films based on TiO₂/Carbon Blacks and TiO₂/Fullerene. The films were prepared by the sol-gel method in non-aqueous media using titanium isopropoxide as the precursor. The sources of nanocarbon include: carbon blacks provided by Columbian Chemical, Co. with different particle size and microstructure, fullerene and fullerenol. We report the optical properties (UV-VIS and IR regions) of these composite films as a function of thickness and carbon concentration, along with their structural transformation (XRD) when subjected to thermal treatment at various temperatures. By grazing angle XRD studies we monitored the effect of fullerene hydroxylation in the microstructure of the composite film. Moreover, the reflectance properties of the absorbing materials described in terms of Kubelka-Munk theory, and the application of the composite films as absorbing coatings in solar concentrators and in low temperature applications, are discussed in the present contribution.

Acknowledgement

The authors thank CONACyT-México for financial support, and J. Ayala (Columbian Chemicals Co.) for the materials provided.