

Construction nanocomposite optical filter through the use of suitably modified nanoparticles

The subject of this work was the manufacturing of optical filters through the use of appropriate nanoparticles which were suitable for greenhouse applications. Once the physical meaning of each optical property was understood, we interpreted the way each type of particle interacted with the photosynthetic (visible spectrum) and infrared radiations. In particular the interaction of nanoparticles with the aforementioned type of radiation was focused on three properties: transmittance, reflectance and absorbance. As the nanosynthetic filters were to be used for greenhouse applications the role of photosynthesis had to be appreciated. Following a literature survey in relation to the type of metal oxides which are available we identified the ones which were most appropriate in terms of their composition and particle size. Finally, the oxides were experimentally characterized and the results were graphed while tabulating the critical parameters for easy access and interpretation. Based on the results a particular oxide was selected and through the implementation of an industrial process which was available a greenhouse cover was fabricated.