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## PREPARATION AND CHARACTERIZATION OF HYBRID NANOCOMPOSITES FILMS

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### Abstract

Hybrid nanocomposites may synergistically combine and enhance the properties of inorganic nanoparticles and organic molecules.

The objective of this paper is to examine particular nanocomposites films based on binary copolymers and inorganic TiO<sub>2</sub> nanoparticles from the structure and properties point of view. These nanoparticles were dispersed in maleic anhydride-styrene (MAS) copolymer by using elaidic acid, trans isomer of the oleic acid, as coupling agent in order to increase the compatibility between the organic and inorganic phases and to reduce the phases separation.

The chemical structure, the particles size distribution, the surface morphology and hydrophilicity/hydrophobicity of obtained nanocomposites were characterized using Fourier infrared spectra (FTIR), scanning electronic microscopy (SEM) and contact angle measurements. It was found that the embedding of the inorganic nanoparticles into the polymer matrix can be physical or chemical, according to the bonding type at the interface between inorganic particles and the polymer. The nanocomposite films (MAS/TiO<sub>2</sub>) obtained presents a uniform network structure. The surface physico-chemical properties of the nanocomposites films were studied by contact angle measurement with different solvents (water, glycerol), determination of dispersive components and surface free energy.

*Key words:* films, nanocomposites, nanoparticles, polymer

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