



NANOCOMPOSITE MATERIALS BASED ON POLYMERS AND ALUMINA NANOPARTICLES

Lucia Dumitrescu^{1*}, Ileana Manciulea¹

¹*The Centre: Product Design for Sustainable Development, Transilvania University of Brasov, Eroilor 29, 500036, Romania*

Abstract

The synergistic combination of polymers and inorganic compounds via sol-gel process has attracted great attention, by manipulating structure at molecular level, for developing new materials with desired properties. These new hybrid materials could have a controllable combination of the benefits of polymers (flexibility, toughness, ease of processing) and those of ceramics or glasses (hardness, durability, thermal stability).

The microstructures and the properties of hybrid materials depend on the particle size of inorganic phase, the uniform distribution of inorganic phase within the organic phase and the interfacial force between the two phases.

The paper presents research concerning the obtaining of composite coating nanomaterials consisting of an organic component (functionalized acrylic copolymers in water dispersion and aluminium lignosulfonate) and inorganic component nano aluminium oxide. The formation of a crosslinked nanometric network of inorganic and organic domains was evidenced by AFM analysis. The interphase characterization of the nanostructured materials was performed using FT-IR analysis.

Key words: acrylic copolymers, alumina nanoparticles, nanocomposites

* Author to whom all correspondence should be addressed: e-mail: lucia.dumitrescu@gmail.com