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Surface characterization of Laponite-Poly(ethylene oxide) nanocomposite films EDUARD A. STEFANESCU, IOAN I. NEGULESCU, WILLIAM H. DALY, Department of Chemistry, Louisiana State University, Baton Rouge, LA 70803, BOGDAN C. DONOSE, ANH V. NGUYEN, School of Engineering, The University of Newcastle, Callaghan, NSW 2308, Australia — The aim of the present work is to understand how ionic strength of precursor polymer-clay gels influences the final structure of multilayered nanocomposite films fabricated from such gels. We have prepared three aqueous precursor gels containing 3wt% LRD, 2wt% PEO and 95wt% water, in which the salt concentrations were kept at 0X, 1X and 3X with X = 5.57 * 10^{-5} g NaCl/mL. The Laponite (LRD) - PEO multilayered films (LRD60%-PEO40%) were fabricated by manually spreading and drying each gel on a glass slide. Prior to the AFM measurements the polymer-clay composite films where freeze-dried by immersion in liquid nitrogen until they were totally degassed. Frozen samples where then fractured and left for additional drying for 24 hours in a desiccator. The imaging procedure employed here was tapping-mode AFM. Distinct features were identified on the layered transversal surface of the films, and were attributed to the different salt concentrations in the samples. Addition of salt increases the adhesion and compactness properties of the nanoparticles, as a more uniform side surface can be observed after freeze-fracturing the materials.

Eduard A. Stefanescu
Dept. of Chemistry, Louisiana State University, Baton Rouge, LA 70803

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