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Synthesis, Structure and Mechanical Properties of Nanocomposites Based on Organoclay and Polymeric Matrix of Different Nature

V.I.Ovcharov (a), M.V.Burmistr (a), K.M.Sukhyy (a), V.V.Shilov (b), Y.P.Gomza (b), V.G.Ovcharenko (a), I.V.Sukha (a), V.I.Tomilo (a), L.A.Sokolova (a)
(a) Ukrainian State Chemical Technology University, Pr. Gagarina, 8, Dnepropetrovsk, 49005, Ukraine
(b) Institute for Macromolecular Chemistry, Ukraine National Academy of Sciences, Kharkivske shausse, 48, Kyiv, 02160, Ukraine

Polymer-clay composites has been prepared by melt blending an organo-bentonite with linear polymers (polyamide, polysterene and polypropylene) in a disk-screw extruder. In first time organo-clay was prepared by surface treatment of Na-forms bentonite with polymeric quaternary ammonium salts (PQAS). XRD indicated that organo-bentonite layers were exfoliated and dispersed into polyamide and polystyrene. Addition of 2 wt.% organo-bentonites (optimal concentration) to polyamide increased tensile strength by 53% and Sharpy impact by 140 %. With the incorporation of 2 wt.% organo-bentonites (optimal concentration) into polystyrene the tensile strength increased to 28 % and the Sharpy impact increased to 25 %. For polypropylyne-organo-bentonites composites we did not observe delamination of layered structure, and as result absence of reinforcements. TGA showed that the polyamide and polystyrene nanocomposites have higher decomposition temperature in comparison with the original polymers.