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Poly(VinylChloride)/Montmorillonite nanocomposites: The Effect of Morphology to the Barrier Properties

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New commercial nanocomposite plastics are emerging rapidly. Les attention has been given to PVC/clay nanocomposites, although Poly(VinylChloride) is the best known and the most widely used vinyl plastics. This paper focuses to the barrier properties of soften Poly(VinylChloride)/montmorillonite nanocomposites and their morphological study also are discussed. Modified type of clay MMT30B and unmodified type of clay MMTNa⁺ were employed as the inorganic phase. Ion-dipole method was used for clay intercalation. This method seems to be versatile and environmentally benign. All nanocomposites were prepared in melt. One screw Buss KO-kneader was used as the compounding machine. The principal aim is to fully exfoliate the clay into polymer matrix and enhanced the barrier properties. The effect of different type of plasticizer and compounding conditions to the barrier properties was investigated. Therefore, the three different values of screw speed were tested. Some materials were compounded twice to study the influence of retention time, orientation of nanoparticles, and exfoliation of clay to the diffusion processes. Prepared samples were tested for Water Vapour transmission (WVT) and their structure was determined on the base of X-ray diffraction and electron microscopy (TEM). Next the O₂ and CO₂ permeability was studied. The migration of plasticizers was observed as well. It can be said that improvement around 30 % by PVC/clay nanocomposites is common.