

# **Organic bentonites-HIPS nanocomposites. Influence of EB radiation on the mechanical properties**

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In this paper the influence of additions of two clay types to form nanocomposite materials with high impact polystyrene as matrix, is discussed. Among the clays used as reinforcing material there are calcic Cuban and sodic Brazilian bentonites. The additions were made at two levels: 5 and 7% relative to the weight of the material. All clays used were subjected to organic modification. Composite material pellets were prepared in a hot extrusion process adding the clays with the aid of a vibrating dispenser. Mechanical tests samples, for tensile and impact tests according to ASTM standards, were elaborated in an injection molding machine. Another objective of this work was to study the effect of electron beam radiation in the mechanical properties of the nanocomposites. Half of the samples were irradiated at 600KGy and tested after a 7 days wait to ensure their stability. The rest of the specimens were tested from their direct injection state. It was shown that an addition of up to 5% of clay as reinforcement in a matrix of HIPS achieved increases in tensile strength over 30% compared with the unreinforced polymer. Additions of higher amounts of clay (7%) represented a decrease on mechanical strength, but remaining even above that of the pure polymer. Electron beam Irradiated samples showed a considerable increase in the mechanical strength with respect to the pure material. Increases between 48 and 56% in the tensile strength were achieved. In all cases, as it is expected elongation and impact strength decreased with the aforementioned increase in tensile strength.