



P-3-328

**EFFECTS OF EPOXY-POLYESTER HYBRID AND NANOCCLAY ON MORPHOLOGY, RHEOLOGICAL AND MECHANICAL PROPERTIES OF STYRENE-BUTADIENE RUBBER**

M.Haghnegahdar<sup>1</sup>, G.Naderi<sup>2\*</sup>, G.R.Bakhshnadeh<sup>3</sup>

<sup>1</sup> *Department of Polymer Engineering, Faculty of Graduate studies, Tehran South Branch, Islamic Azad university, Tehran, Iran* and <sup>2,3</sup> *Department of Rubber, Iran Polymer and Petrochemical Institute, Tehran, Iran*

*( E-mail: [G.Naderi@lppi.ac.ir](mailto:G.Naderi@lppi.ac.ir) )*

Properties of SBR compounds filled with two kinds of filler, Epoxy-Polyester Hybrid resin (10, 20, 30, 40 phr) and Nanoclay (Closite 15 A) (1, 3, 5, 7 phr) were studied. Microcomposite samples and nanocomposite samples were prepared by Haake internal mixer. Curing agents and additives i.e. dicumylperoxide (DCP), Carbon Black (CB) and oil were added to the compound on the two-roll mill. The modified silicate is analysed by X-ray which suggested intercalation of elastomer chains into silicate layers. Mechanical properties of the samples suggested that both fillers increase modulus, but sample containing 30 phr resin show higher value of modulus than sample containing 7 phr nanoclay. Rheological measurement showed that both fillers lead to an increase in viscosity and dynamic modulus of samples which is as a result of good interaction established between polymer/filler. Moreover, due to nanometer scale of nanoclay particles, reinforcing effect of Nanoclay was more noticeable and in micrometer scale of Epoxy-Polyester Hybrid particles, Epoxy resin cured by Polyester is used to improved wet ability of SBR compounds . SEM photomicrographs of cryogenically fractured samples confirmed the mentioned results.