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REINFORCEMENT OF EPDM ELASTOMER BY ALUMINUM TRIACRYLATE REACTIVE FILLER

akram shokrzadeh, Gholam Reza Bakhshandeh, mohammad j. Zohuriaan Mehr, ghasem Naderi,

Faculty of Process, Iran Polymer & Petrochemical Institute

**Corresponding author: a_shokrzadeh2007@yahoo.com*

In this research Aluminum acrylate having general formule, $(CH_2=CH-COO)_3Al$ as a reactive filler for elastomers were used. Two composites based on ethylene propylene diene monomer rubber (EPDM) and with two types of filler, calcium carbonate and ALTA were prepared by a laboratorial roll. The synergistic effect of different ratios of fillers on curing characteristics, morphology and mechanical properties such as tensile properties, hardness, and abrasion resistance were studied. The increase of ALTA filler content leads to the increment in tensile strength, modulus, hardness, elongation at break and also the increment in abrasion resistance in composites. Greatly Improvement of ALTA with subsituation of calcium carbonate is attributed to the homopolymerization and graft copolymerization of ALTA at the same time during the curing of the EPDM composites by peroxide. SEM micrographs showed that ALTA can improve homogeneity and the interfacial bonding between EPDM and filler. Cure rheometers showed that the addition of ALTA to the composite caused a decrement in scorch time and optimum curing time. More ever, the addition of ALTA results in the increase of maximum and minimum torque differences and that is due to the increase of crosslink density.