

ABSTRACT

Zinc sulfonated EPDM (SEPDM) of high ethylene content behaves as an ionic thermoplastic elastomer and shows improved physical properties as compared to the parent EPDM. While paraffinic oil plasticizes the hydrocarbon backbone of SEPDM, DMSO and DEG plasticize the ionic domains. HAF carbon black, precipitated silica and hard clay improve the physical properties of SEPDM. Fillers interact with the hydrocarbon backbone of the polymer, and the ionic aggregates present in the 'multiplets' and 'clusters'. Both paraffinic oil and zinc stearate plasticize the SEPDM compounds. While paraffinic oil functions as a plasticizer both at ambient conditions and at elevated temperatures, the plasticizing ability of the zinc stearate is observable only at high temperatures. The compounds containing a combination of both paraffinic oil and zinc stearate show minimum melt viscosity. Blends of zinc salt of poly(ethylene-co-methacrylic acid) and a rubber grade of SEPDM show thermoplastic elastomeric behaviour and synergism in properties.

Keywords : *ionomer, ionic thermoplastic elastomer, zinc salt of sulfonated ethylene-propylene-diene monomer rubber, zinc salt of poly(ethylene-co-methacrylic acid), blend, HAF carbon black, silica, clay, paraffinic oil, dimethyl sulfoxide, diethylene glycol, zinc stearate, plasticizer, physical properties, dynamic mechanical analysis, dielectric thermal analysis, glass-rubber transition, multiplets, clusters.*