ABSTRACT

A blend of two or more functionally reactive rubbers can be crosslinked through condensation or substitution reactions when heated to a high temperature during moulding. Such rubber blends that are crosslinked by chemical reactions utilizing the reactive functional groups of the individual rubbers in the absence of any extraneous curing agents are designated as 'self-vulcanizable rubber blends'. Examples of such binary blends include ENR-hypalon, hypalon-XNBR and neoprene-XNBR. The extent of crosslinking reaction depends on the availability of the functional groups of the two blend components as well as, time and temperature of the reaction. In general, these blends behave like conventional rubber vulcanizates with respect to physical properties and reinforcement by fillers. The blend composition and level of epoxidation in ENR has profound effect on miscibility of ENR-hypalon blend system. The hypalon-XNBR system is completely miscible at the segmental level and neoprene-XNBR system is immiscible at all blend ratios. The blends show pseudoplastic flow behaviour and follow the Power law model. The blends show good aging (air, acid, oil) resistance property. Such self-vulcanizable rubber blends open up new area of research in the field of rubber technology in general and in the area of blends in particular.

Key-words

Epoxidised natural rubber (ENR); hypalon; carboxylated nitrile rubber (XNBR); neoprene; self-vulcanizable rubber blend; miscibility; glass transition temperature; physical properties; aging behaviour; moulding time; moulding temperature; blend ratio; carbon black; pseudoplastic flow behaviour; viscosity; extrudate die swell.