A B S T R A C T

The effect of a set of boron compounds, namely, boron carbide, boron nitride, boron oxide, and disodium tetraborate decahydrate, on curing, physical and electrical properties of natural rubber (NR)-, nitrile rubber (NBR)- and silicone rubber (VMQ)-based gum (varying the proportion of boron compounds), filled (carbon black and silica) and silane (tetrasulfide, mercapto, amino and vinyl) treated filled vulcanizates were studied. The curing, physical and electrical properties of the vulcanizates as measured to evaluated their conditions under equivalent manufacturing and service environments indicated the function of the individual boron compounds attributable in general to their basic physico-chemical characteristics.

Key Words : Additives, silane coupling agents, cure retardability, scorching, curing characteristics, crosslinking, crosslinking formation, delay time, curing kinetics, precursor formation, radical formation, rate index, quenching ratio, Coran's model, interaction coefficient, crosslink density, vulcanizates, deformation properties, ageing properties, liquid resistance, electrical properties, dielectric constant, dielectric loss, dielectric properties, volume resistivity, specific polarization, thermal characteristics, degradation kinetics.