

VULCANIZATION OF ULTRASONICALLY DEVULCANIZED SBR ELASTOMERS

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ABSTRACT

Sulfur cured SBR elastomers, devulcanized by high power ultrasonic irradiation, were revulcanized by using the same curing conditions as for virgin SBR. Crosslink density and gel fraction of virgin, devulcanized, and revulcanized elastomers were measured. Curing behavior of some model compounds based on virgin and devulcanized SBR was investigated. Strongly pronounced differences between the curing behavior of virgin and devulcanized elastomers were observed. Torque and DSC studies indicate that two different processes during the crosslinking of devulcanized rubber take place. The existence of these two processes is explained by crosslinking of sulfidized polymer chains followed by crosslinking due to the presence of sulfur and accelerator. Chemical differences between virgin and devulcanized elastomers, explaining the observed phenomena, are discussed.