

Effects of Vulcanization System on Hardness of Elastomeric Materials under Various Temperatures

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The effects of vulcanization system on the hardness of elastomer compounds were investigated as a function of temperature. Elastomers were compounded with various sulfur and peroxide content. In the sulfur-cured system S-S linkages are formed, and in the peroxide-cured system C-C linkages are formed. A newly designed IRHD-type hardness tester was used to investigate the hardness of elastomers. The crosslink density was calculated using the Flory-Rehner equation by the swelling method. The increase in the modulus of elastomer with increase in temperature above T_g is related to an increase in entropy. The results show that the hardness increased with increasing the crosslink density and temperature.