

BASIC STUDY OF CONTINUOUS ULTRASONIC DEVULCANIZATION OF UNFILLED SILICONE RUBBER

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ABSTRACT

The present paper describes a basic study of the devulcanization of unfilled model silicone rubber vulcanizates using a continuous ultrasonic reactor. The devulcanization was conducted under several processing conditions. Cure behavior, rheological properties, structural characteristics of the devulcanized rubber, and mechanical properties of revulcanized rubbers were studied. Gel fraction and crosslink density measurement indicate that the rubber is partially devulcanized. The gel permeation chromatography (GPC) results imply that the creation of a branched structure in the network is a possibility after devulcanization. Under the optimal devulcanization condition, the mechanical properties of revulcanized rubber are better than those of the virgin rubber. Devulcanized silicone rubber was also blended with the virgin one. The blends show the same tensile strength and modulus as the virgin rubber but higher elongation.