Microwave Energy Applied to Chloroprene Rubber Devulcanization

Sandra R. Scagliusi[1], Sumair G. de Araújo[1], Liliane Landini[1], Ademar B. Lugão[1]

[1] Nuclear ans Energu research Institute – IPEN-CNEN/SP.Av. Professor Lineu Prestes, 2242 – Cidade Universitária- 05508-000, São Paulo-SP
E-mail address: scagliusi@usp.br

Abstract

Among the vulcanized elastomers, the chloroprene rubber (DuPont Neoprene® - generic name) possesses a good performance, being one of the most used until the current days. However, when these kinds of polymers do not have more utility they damage the environment if they are not reprocessed or recycled. A method that has been used world-wide and that is an important tool in the rubber devulcanization is microwave energy (by using high temperatures). Elastomer waste may be devulcanized without depolymerization and permits a new vulcanization into a product having physical properties essentially equivalent to the original vulcanized. In this work, the chloroprene samples were irradiated in microwave generator equipment with 2,450MHz (frequency) and 1,000W to 3,000W (power). The results of the characterized samples (according to ASTM standards), before and after irradiations, show that it is possible to vulcanize again these rubber types where they may be used in formulations replacing unused rubber parts.

Keywords: microwave, chloroprene rubber, devulcanization, rubber characterization