



VULCANIZATION BEHAVIOR OF NBR WITH ORGANICALLY MODIFIED CLAY

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The main objective of this work is to study the vulcanization behavior of Nitrile Butadiene Rubber (NBR) filled with organically modified clay, by torque rheometry. NBR was an aleatory acrylonitrile-butadiene copolymer with 33% bound acrylonitrile. Two different grades of NBR were used, one of them has Mooney viscosity (ML(1+4) at 100°C: 28), NBR 3330, and the other (ML(1+4) at 100°C: 48), NBR 3350. The NBR was mixed in a two roll mill at room temperature with an appropriate vulcanization system and clay. The amount of filler used was 0 (neat rubber), 1, 3, 5 and 7 phr.

According to the results, the presence of clay reduced the induction time of nanocomposites in comparison to the neat rubber, i.e. the presence of clay has accelerated the vulcanization process of samples.

The rheometer provides a torque that is related to rubber module [1,2]. With the formation of cross-links in the samples, there is an increase of viscosity of rubber, which increases the torque measured by the equipment. Therefore, the higher the density of cross-links present in the sample, the greater the torque measured during the test. The results presented in terms of MH (maximum torque measured during the test) showed that, overall, there was a reduction of this parameter as the clay concentration increases, indicating a decrease in crosslink density with the increase of filler amount.

[1] R. Ding, A. Leonov, Journal of Applied Polymer Science. 61, 455-463 (1996).

[2] S. Chouch, D. Chang, Journal of Applied Polymer Science. 61, 449-454 (1996).