Crosslink Density in Carboxylated Nitrile Rubber Nanocomposites

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Abstract: In this work, nanocomposites of carboxylated acrylonitrile butadiene rubber (XNBR), cellulose II, and montmorillonite were prepared by co-coagulation of XNBR latex, cellulose xanthate, and clay aqueous suspension mixtures. The incorporated amount of cellulose II was 15 phr, and the clay varied from 0 to 7 phr. The clay was previously exfoliated in water, and the resulting suspension was then added to the mixture of XNBR latex with cellulose xanthate. The materials used were: XNBR latex with 28% of acrylonitrile from NITRIFLEX, cellulose xanthate with 9.6% cellulose, from Vicunha Textil, and clay from Wyoming, with a cationic exchange capability of 110 meq/100 g were used in the preparation of nanocomposites, cured by zinc oxide. The details in obtaining nanocomposites can be seen in a recently published work [1]. The vulcanizing ingredient and others additives were used as received. The rubber compounds were prepared in an open two-roll mill at a speed ratio of 1: 1.25, according to ASTM D 3187, at room temperature. The state of dispersion of cell II and MMT was studied by transmission electron microscopy (TEM). The Rubber Processing Analyzer (RPA 2000), from Alpha Technolgy is a Dynamic Mechanical Rheometer and was used to measure the storage shear modulus (G') of the stocks in order to calculate the crosslink density as describe in ref 2. The influence of cellulose II and clay in crosslink density were estimated by using the RPA rheometer. The results have shown that cellulose II is mainly responsible for the reinforcement of rubber compositions.

REFERENCES

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