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Evaluation of Activity of Fillers in Rubber Blends and Correlation of Filler activity with Mechanical Properties of Vulcanizates

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For evaluation of filler activity in rubber blends, Wolff described the method based on measurement of vulcanization curve in oscillation rheometer. This method was applied preferably for traditional fillers such as carbon black. In the last several years, the new types of fillers are used in the rubber industry, mainly fillers from renewable resources in form of natural polymers. In our work we tried to evaluate the activity of some natural organic fillers using the Wolff coefficient of activity. We found that Wolff coefficient of activity, which is in good correlation with mechanical properties of filled rubber blends for traditional fillers do not satisfy correct values for new types of fillers in form of natural polymers. In our work the new method for filler activity evaluation is described. The principle of new method is the quantification of filler-filler and filler-rubber interactions based on Payne effect measurement using RPA technique. The obtained results give very good correlation between filler activity measured according to our method and mechanical properties of vulcanizates.