

## **Effect of cation exchange capacity on properties of modified clay-rubber composites**

Modification of kaolin through ion exchange reaction upgrades low cost mineral fillers to match expensive reinforcing carbon blacks. Modified cheap clay fines reduce compound's cost and improve competitiveness of local rubber products at market.

Effect of cation exchange capacity of kaolin on properties of modified clay-rubber composites was studied. Rubber grade kaolin was divided by sedimentation using Anderson pipette into number of fractions, each containing particles of a specified size.

Kjeldhal method with boric acid test was done to find the cation exchange capacity of each fraction or amount of cations involved in ion exchange reaction with modifying agent. In the course of reaction exchangeable cations were replaced with organo-functional modifying cations that changed hydrophilic kaolin structure into hydrophobic one, easily combined with organic rubber matrix. Functional groups in those organo-functional cations were available for physical or chemical interaction with rubber polymer.

Results showed that finest kaolin fractions with narrow particle size distributions displayed higher cation exchange capacity and were more susceptible to modification, resulted in strong reinforcing effect. Improved physico-mechanical properties of vulcanised clay-rubber composites confirmed benefit of modification of fine grained clay fines, which can be used

as a fairly good substitute for expensive imported reinforcing fillers in rubber formulation technology.