Properties of rubber naoncomposites filled by modified carbon blacks and carbon nanofibers

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Properties of various carbon black/rubber composites filled with carbon blacks used as catalysts in methane decomposition reactions were investigated through mechanical properties, surface resistivity and SEM analysis. The specific surface area of N330-f black increased with low weight gain in methane decomposition and the correlated tensile strength of carbon black/rubber composites also increased compared to that of filled with raw carbon black. But there were no significant differences in modulus at 300% strain. With the increase of carbon black loading ratio in composites tensile strength, 300% modulus and elongation always increased. While the surface resistivity of carbon black/rubber composites showed reverse trend. Reinforcement properties of carbon nanofiber/rubber composites filled by carbon nanofiber before and after heat treatment were also determined. With increasing heat treatment temperature, the specific surface area of carbon nanofiber was decreased. Although mechanical properties of heat treated carbon nanofiber/rubber composites were subjected to moderate changes, the surface resistivity of composites underwent discernable increase because of increasing conductivity of carbon nanofiber.