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From Nano to Giant?

Designing Carbon Nanotubes for Rubber Reinforcement and their Applications for High Performance Tires

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ABSTRACT

Carbon nanotubes (CNTs) attract considerable scientific and engineering interest because of their excellent mechanical, electrical and thermal properties. Today, when manufacturers use CNTs, purification, chemical modifications and dispersion techniques are usually applied rendering them cost-effective in large-scale applications. Our research shows that multi-wall CNTs bundles (MWCNTBs) with the same alignment, orientation and high surface defects for each CNT can be directly incorporated into the elastomer matrix through melt compounding. A uniform dispersion of CNTs and strong interfacial interactions between elastomers and CNTs due to the silane-coupling agent can be simultaneously produced. The resulting elastomer/MWCNTBs nanocomposites demonstrate excellent mechanical properties,

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