

## REMARKABLE PROPERTIES OF CARBON NANOTUBES

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Carbon nanotubes (CNTs) were discovered by Iijima in 1991. Since then, research on this field has been attracting much attention to explore their unusual mechanical, electrical and optical properties.

There is a lot of possible applications of nanotubes in different fields of science, technology, electronics, optics and even medicine. CNTs are ideal reinforcing material for a new class of superstrong nanocomposites due to their extraordinary properties, such as the exceptionally high stiffness and strength, the extreme resilience, the ability to sustain large elastic strain, as well as the high aspect ratio and low density. But the main reason for studying CNTs mechanical properties is their tremendous strength. For example, addition of just 1wt.% CNTs to polystyrene leads to increase of Young's modulus and strength by approximately 35 % – 42 % and 25 %, respectively.

Investigations of nanotubes properties have focused both on experimental and theoretical study. The first one has a lot of difficulties arising from the tube's nanoscale, necessity for complicated and expensive equipment and apparatus with large resolution. Experimental methods for measuring the mechanical properties of CNTs are mainly based on the technologies of transmission electron microscopy (TEM) and atomic force microscopy (AFM). Another way of studying is theoretical. Computational simulation is a powerful tool relative to the experimental difficulties.

The accurate assessment of the mechanical properties of nanotubes is an important step towards the potential development of the structural composites.

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