

## MATERIALWISSENSCHAFTLICHES KOLLOQUIUM

am Mittwoch, 25.05.2011  
um 17.15 Uhr – Raum 0506, Geb. K, DE 15

# Nanotube morphologies customised to demand

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Carbon nanotubes (CNTs) are the subject of widespread research due to their predicted outstanding properties. Consequently they are expected to be ideal components for a wide range of applications across the length scales and disciplines. Applications of CNTs include fillers in multifunctional composite materials, building blocks in nanoelectronic devices, biocompatible carriers for medical applications, high performance chemical sensors, and many more. Unfortunately, for most products CNTs with well defined properties are needed at commercially viable prices, but current production methods do not fulfill those requirements.

Recently, we showed that control over structure, diameter distribution, defect density and oxidation resistance of the nanotubes can be indeed be achieved if dopant atoms are carefully selected and/or combined and if their incorporation is well controlled. We used complementary characterisation techniques in conjunction with *in-situ* transmission electron microscopy studies in order to identify general trends of the structure properties relationships resulting from the incorporation of foreign atoms within the carbon network. In addition to identifying general trends in the structure properties relationship found in nanostructured materials, developing standardised characterisation protocols, defining growth systematics, and establishing standardised nomenclature is of vital importance for developing new nanostructured materials suitable to address society's future needs.