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Carbon nanotubes are exceptionally interesting from a fundamental research point of view. Many concepts of one-dimensional physics have been verified experimentally such as electron and phonon confinement or the one-dimensional singularities in the density of states; other 1D signatures are still under debate, such as Luttinger-liquid behavior. Carbon nanotubes are chemically stable, mechanically very strong, and conduct electricity.

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The ratio of these two gives the number q of graphene hexagons in the nanotube unit cell. Since the graphene unit cell contains two carbon atoms, there are $2q$ carbon atoms in the unit cell of the nanotube. In achiral tubes, $q = 2n$. The structural parameters given above are summarized in Table 2.1.

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General description. Carbon nanotubes are considered to have some exceptional characteristics. They are chemically very stable, mechanically very strong and conduct electricity. They open up new perspectives for various applications, such as nanotransistors in circuits, for hydrogen storage in fuel cells, as artificial muscles, or as an added reinforcement in alloys.

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Carbon Nanotubes: Theoretical Concepts and Research ...

Carbon Nanotubes Research on the science and applications of carbon nanotubes (CNTs) will soon enter into its third decade. The initial flood of papers describing the extraordinary properties of CNTs has generated great excitement, promising technological breakthroughs in fields as diverse as nanoelectronics, bio-medicine and aerospace.

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Carbon Nanotubes: Basic Concepts and Physical Properties S Reich, C Thomen & 1. Maultzsch 0 2004 WILEY-VCH Verlag GmbH & Co. 2 Structure and Symmetry Carbon nanotubes are hollow cylinders of graphite sheets. They can be looked at as single molecules, regarding their small size (- nm in diameter and - pm length), or as quasi-one

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Carbon nanotubes are single sheets of graphite (called graphene) rolled into cylinders. The diameter of the tubes are typically of nanometer dimensions, while the lengths are typically micrometers. This huge aspect ratio leads to unusual electrical transport. Notably some tubes behaving as metals and others as semiconductors.

Carbon nanotubes - University of Oxford

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