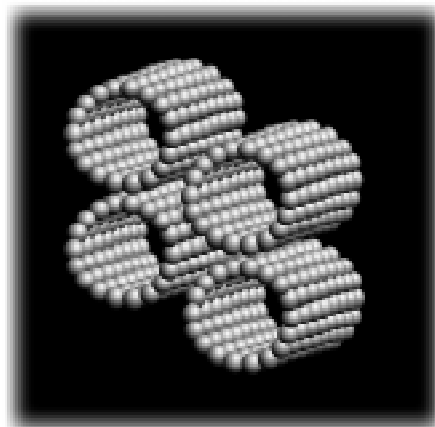


Carbon Nanotubes

Carbon nanotubes are long, cylindrical molecules consisting of a circular array of sp^2 hybridized carbon atoms. They are capped at both ends and can be thought of as elongated fullerenes. Two types of nanotubes have been discovered: single-walled nanotubes¹ and multi-walled nanotubes.² Single-walled nanotubes are single tubes that are approximately 1 nm in diameter and 1–100 microns in length. In multi-walled nanotubes, each tube is embedded within a larger tube. Single-walled nanotubes are of interest as building blocks for nanoscale materials.³ More interesting is their potential as quantum wires in nanoscale electronic devices!⁴

Recent advances in technology have allowed for the production of commercial quantities of single-walled nanotubes. Aldrich is proud to offer single-walled carbon nanotubes from CarboLex, Inc. of Lexington, Kentucky. Research quantities are available in two grades, an AP grade and a higher-purity SE grade.

The AP-grade product consists of prepared bundles of single-walled carbon nanotubes, with 10–200 individual nanotubes per bundle. The average diameter of the nanotubes is 13 Å, with almost all tubes falling within the diameter range of 12–15 Å. The purity of the AP-grade products ranges from 50% to 70% by volume. Major impurities are carbon nanospheres and carbon-encapsulated catalyst nanoparticles.



The SE grade also consists of prepared bundles of single-walled carbon nanotubes. However, they are manufactured by a proprietary process which produces nanotubes with a purity of 85–95% by volume. They are not chemically post treated: Thus, the physical properties are similar to those of the AP grade, but the SE-grade nanotubes are significantly more pure.

For more information, please contact us at **1-800-231-8327** (USA) or look for us on the Web at **www.sigma-aldrich.com**. Technical information and links to other nanotube sites are also available on the Web from CarboLex, Inc. at **www.carbolex.com**.

Carbolex, Inc. listings (Single-walled nanotubes)

51,931-6	Carbon nanotubes , single-walled, CarboLex SE-grade, 12–15 angstrom diameter	100mg; 500mg
51,930-8	Carbon nanotubes , single-walled, CarboLex AP-grade, 12–15 angstrom diameter	250mg; 1g

Other products (Multi-walled nanotubes)

40,607-4	Bucky tubes , powdered cylinder cores	25mg; 100mg; 500mg
41,300-3	Bucky tubes , cylinder cores, shell removed	100mg; 500mg
41,299-6	Bucky tubes , powdered as-produced cylinders	100mg; 500mg
41,298-8	Bucky tubes , as-produced cylinders	100mg; 500mg

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