

# Carbon Nanotubes (CNT)

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Figure 1: © Image by Dean Simone from Pixabay.

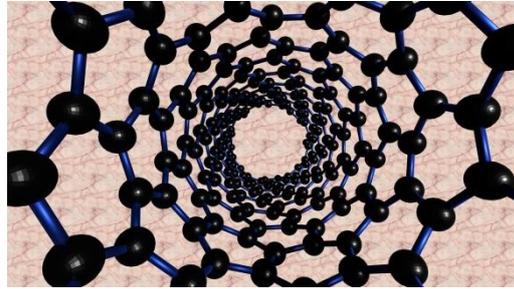


Figure 2: © Image by Dean Simone from Pixabay.

## 1. What is a Carbon Nanotube?

Carbon nanotubes are small tubes made of carbon, whose walls consist only of a carbon framework. They represent a further modification of the element carbon in addition to graphite, diamond, fullerenes and graphene. A distinction is also made between single-walled and multi-walled carbon nanotubes.

Carbon nanotubes are mainly obtained by three different techniques: arc discharge between carbon electrodes, laser ablation of graphite or chemical vapour deposition (CVD), which is a catalytic driven decomposition reaction. <sup>[1]</sup>

## 2. (Commercial) Use of the Material and its Applications

By varying the structure, diameter, number of walls or filling of the carbon nanotubes, their physical and mechanical properties can be tailored. This makes carbon nanotubes attractive for many different fields of application. However, no applications on an industrial scale are known so far.

Despite no current industrial use is existing, a variety of applications is under development such as carbon nanotube transistors, the environmental monitoring, the improvement of the mechanical properties of plastics by incorporating carbon nanotube, carbon nanotube storage units, and much more.

## 3. How can I come into contact with this material?

In everyday life, people rarely come into contact with carbon nanotubes, as they are not yet used on an industrial scale, besides the application in form of composite materials e.g. in fishing. This will naturally change once an increasing number of products are brought onto the market containing carbon nanotubes.

## 4. Relevance for risk governance

Due to their fibre-like structure and the resulting similarity to asbestos, carbon nanotubes are already under discussion with regard to their risk assessment. In this context, a main focus lies on the

uptake of carbon nanotubes into the lung. However, there are not enough toxicological studies for a risk assessment at this stage.

## **5. References**

[1] <https://www.nanopartikel.info/en/nanoinfo/materials/carbon-nanotubes/overview>