

NANO YOU How is "nano" special?

Nanoscience is not just the science of the small, is the study of materials that exhibit remarkable properties, functionality and phenomena because of their small dimensions.

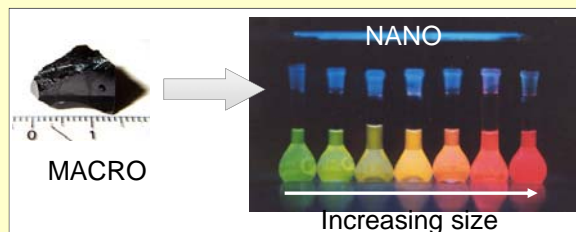
Optical Properties

Changing the size of a material can change its colour

Gold



Cadmium Telluride



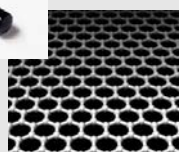
Nanoparticles of CdTe.
A. Eychmüller, Technische Universität Dresden

The same material at the nanoscale can have properties which are very different (even opposite!) to the properties the material has when it is "macro".

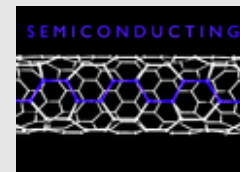
Mechanical and Electrical Properties



Graphene is brittle and non conductive



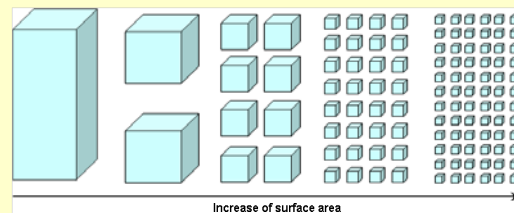
Carbon nanotubes are like rolled up graphene sheets...however they have totally different properties.



Did you know? Carbon nanotubes are much stronger than steel yet much lighter, and they can be conductive.

Reactivity

If you take a bulk material and subdivide it into many individual nanoparticles, the total volume remains the same, but the **collective surface area is much, much bigger!**



More surface means....

Change in catalytic activity

Change in boiling point

Change in solubility

Change in reactivity

