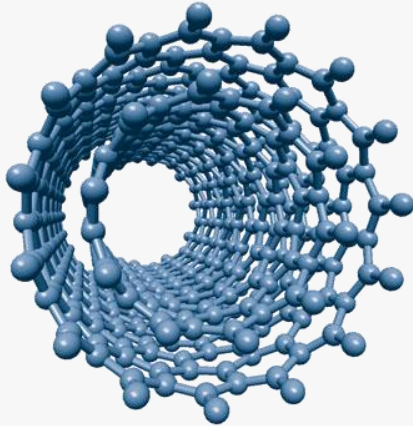




TÉCNICO
LISBOA

IN+
CENTER for
INNOVATION,
TECHNOLOGY
and POLICY
RESEARCH

Synthesis of Carbon Nanotubes



Luísa Maria Leal da Silva Marques

Laboratory of Thermofluids, Combustion and Energy Systems
Center for Innovation, Technology and Policy Research IN+

IN+ GET TOGETHER

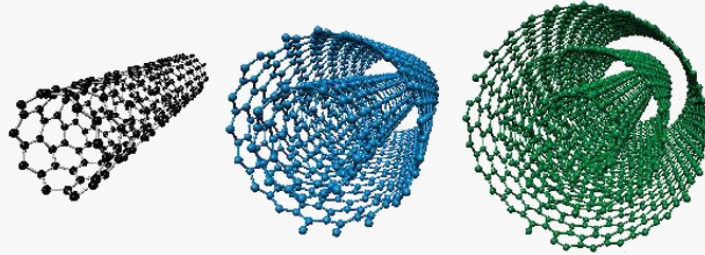
Prof. Edgar Caetano Fernandes

20th September, 2019

Motivation and Context

Carbon nanotubes (CNTs) take part in our daily life:

CNTs are tubes made of carbon with diameters in the range of a nanometer. These cylindrical carbon molecules **have interesting properties** that make them potentially useful in many applications in nanotechnology, electronics, electrochemical devices or gas sensors.



High cost of production to CNTs synthesis!

The challenge - Make it:



Produce CNTs from sustainable and scalable synthesis with
alternative and sustainable fuel (biogas)



Objective

Design and produce CNTs in a sustainable way which can be used in advanced **NH₃ gas micro-sensor** for environmental monitoring at room temperature.

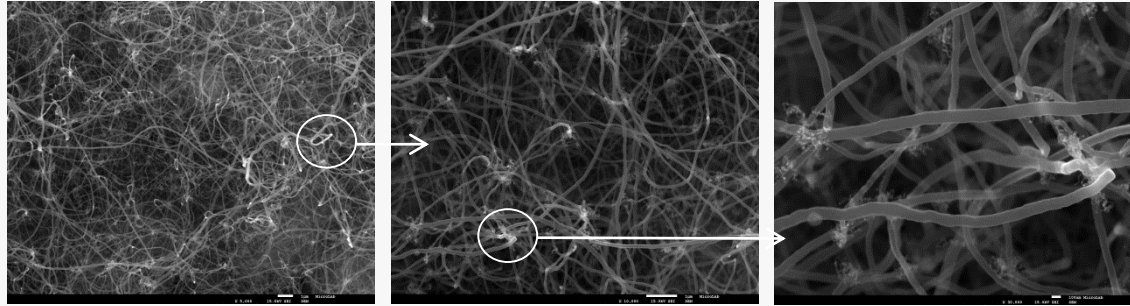
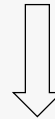


Figure 1: Scanning electron microscopy micrographs for first CNTs morphology obtained by **flame synthesis** in Laboratory of Thermofluids, Combustion and Energy Systems.



Why?

NH₃ has now accepted as the possible **fuel of the future** [1].