

DESCRIPTION OF CNTS INTERCALATED STRUCTURES OBTAINED BY CVD

Eric Jover, Burak Caglar, Toygan Mutlu, Enric Bertran
FEMAN group, IN2UB, Dep. de Física Aplicada i Òptica, Universitat de Barcelona, Martí i Franqués 1, E-08028 Barcelona, Spain
ebertran@ub.edu

From their discovery in 1991, carbon nanotubes (CNTs) have been an attractive research topic due to their original properties. Although much has been said on CNTs, new applications and new research perspectives are discovered everyday. In this way, publications on all the fundamental areas related to this topic continue to increase.

Growing CNTs is normally carried out on metallic catalyst such as Fe, Ni, Co, ... From a catalyst layer, after an annealing step, a CNT is grown from each resulting particle being different growing mechanisms possible. Catalyst thickness layer and the diameter of the Fe particles, after annealing, have been correlated with the diameter of the obtained CNTs.

In this work, we reported the growing of CNTs on SiO₂ substrate following a Chemical Vapour Deposition (CVD) and showing a non normal configuration. In our working conditions CNTs grow intercalated between the substrate and a non-homogeneous catalyst layer (Fe) (Figure 1). Annealing step was carried out in a H₂ reductive atmosphere. CNTs growing take place under an ammonia/C₂H₂ atmosphere.

The correlation between the appearance of this phenomenon, the catalyst layer thickness and the CVD deposition temperature has been assessed using a box-Wilson experimental design. The obtained samples have been characterized by means of SEM and SEM-EDX.

Figures:

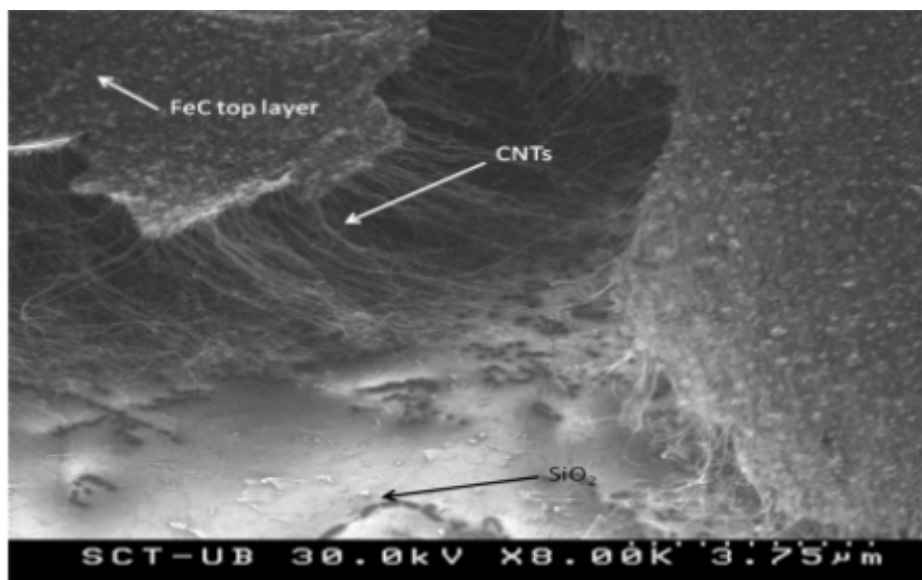


Figure 1. SEM image of a CVD sample where the intercalated CNTs structure could be observed.