

# **Nanocomposites and nanomaterials**

## **Study of carbon nanotubes production from products of natural gas conversion**

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The analysis of existing methods of carbon nanotubes (CNTs) production demonstrates the advantages of the method of catalytic synthesis. This method is characterized by relatively low energy intensity of the process, the use of cheap raw material which contains carbon, the possibility of creating a high-performance industrial production, simplicity of equipment and lack of thorough cleaning of the obtained product. Methods of catalytic synthesis differ one from another by the raw material from which carbon is evolved, type of catalysts on which carbon is deposited, temperature regimes.

In the present work there were studied new approaches which would give the possibility to continuously receive CNTs. As the basic technology it was used process at moderate temperatures (in the range of a kinetic-thermodynamic maximum of passing of Bell-Boudoir reaction). Products of air conversion of natural gas with strictly controllable hydrogen, carbon and oxygen potentials were used in a role of reactionary gas.

Experiments proved the positive influence of hydrogen for CNTs forming. Hydrogen always presents in great quantity in the converted gas. The research of various catalysts for low-temperature CNTs synthesis shown the good results of fresh-reduced iron ore concentrates. The proposed technology allows an obtaining of so-called "large" CNTs, which are one of the most promising carbon nanomaterials for medicine, electronics, and even ultra-light body armour.