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## Synthesis of carbon nanotubes onto Al<sub>2</sub>O<sub>3</sub>-spheres with Ni-nanoparticles coating

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The beginning of XXI century was marked by the revolutionary development of nanotechnologies and nanomaterials. In a practical sense carbon nanotubes are the most discussed and promising objects of the nanoworld. For practical, using it is essential to prepare high-quality CNTs with various constructions in large scale. Since 2006, worldwide CNT production capacity has increased tenfold. The annual number of scientific publications on CNT and issued patents continues to grow. Due to their unique physicochemical properties carbon nanotubes are believed to be materials of the future what caused an exceptional splash during investigation of the carbon nanomaterials. The most common approach of synthesis of carbon nanotubes is the chemical vapor deposition method. Number of parameters, such as choice of initial carbon containing raw materials (gas or liquid), transport gas, catalyst, temperature and processing time, plays a major role in the synthesis of carbon nanotubes. As a rule, catalyst is a matrix which surface is covered with a layer of active component. In our work, the synthesis was carried out in a vertical CVD reactor using acetylene and nitrogen as initial gases with a volume ratio of 1:9 respectively. Al<sub>2</sub>O<sub>3</sub> spheres with a diameter of 0.5-1 mm and purity of 99.5% were used as the catalyst. Nickel coating was applied on the spheres surface by solution combustion method. Firstly, initial spheres were impregnated with an aqueous solution of nickel nitrate and fuel, followed by drying and heat treatment. Citric acid and ascorbic acid were used as fuels. After heat treatment, nickel nanoparticles coating was formed on the surface of the spheres. Obtained carbon nanotubes were studied by scanning electron microscopy and Raman spectroscopy.

## **Biography**

Smagulova Gaukhar has completed her PhD in Nanotechnology and Nanomaterials, Head of the laboratory Functional Nanomaterials, Institute of Combustion Problems and Senior Lecturer of the School of Chemistry and Chemical Technology at Al-Farabi Kazakh National University, Kazakhstan. She is author of two patents and has 18 papers in the rating journals of Kazakhstan and foreign countries. She has completed scientific Internships in the University Texas at Dallas and Waseda University.

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