

FABRICATION OF COMPOSITE MATERIAL BASED ON MULTIWALL CARBON NANOTUBES OBTAINED ON DIATOMITE SUBSTRATE

**Nazhipkyzy M^{1,2,*}, Nurgain A.^{1,2}, Temirgaliyeva T.S.^{1,2}, Zhalgasbaikyzy A.¹,
Zhaparova A.A.^{1,2}, Lesbayev B.T.^{1,2}, Prikhodko N.^{1,3}, Mansurov Z.A.^{1,2}**

¹Institute of Combustion Problems, The laboratory “Synthesis of carbon nanomaterials in flame”,
Bogenbai Batyr str., 172, 050012, Almaty, the Republic of Kazakhstan

²Al-Farabi Kazakh National University, Faculty of chemistry and chemical technology,
Department of chemical physics and material science, Al-Farabi avenue 71, 050038, Almaty,
the Republic of Kazakhstan

³Almaty University of Power Engineering and Telecommunications, st. Baitursunov 126,
Almaty, the Republic of Kazakhstan

e-mail: meruert82@mail.ru

Diatomite is a silicon dioxide mineral containing fossilized skeletal remnants of one-cell water plants called diatom algae. Due to a number of significant advantages as high specific surface area, easy regeneration, the price, availability, it can be used in various industries.

At the presented work, diatomite mineral was used as a matrix for growth of multiwalled carbon nanotubes. For synthesis of carbon nanotubes, there is used the method of chemical catalytic vapor deposition (CCVD) from the gas phase. The propane-butane gas mixture was used as a gaseous carbon source. Argon gas was used as an inert carrier gas. Nickel nitrate was selected as an accelerator in order to obtain carbon nanotubes. To optimize the catalyst particles, diatomite was heated with nickel nitrate at 400-500°C.

The synthesized multiwall carbon nanotubes were characterized using Scanning Electron Microscopy and Raman spectroscopy of the obtained samples in various temperature from 650°C up to 800°C. The experiments at different temperatures were performed three times to ensure repeatability of the results. The correlation between quality of CNTs and synthesis temperature is shown. The effect of defect density on the features of Raman spectra of carbon nanotubes is discussed. Multiwall carbon nanotubes obtained on diatomite substrate in future can be used as a composite material for fabrication of water purification sorbent.