

Comparative analysis of sensory activity of carbon nanotubes with boundary modification

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Abstract - The high sensitivity of the electronic properties of nanotubes to molecules adsorbed on their surface and the unparalleled unit surface providing for this high sensitivity make CNT a promising starting material for the development of superminiaturized chemical and biological sensors. Sorption gas sensors are the largest group of gas sensors. Their main operation principle is adsorption during which an adsorbed gas molecule transfers an electron to or takes it from a nanotube. In this paper we represent the investigation of sensor selectivity for alkali metals and their ions for boundary modified with carboxyl, amino or nitro group carbon nanotube. It has been found that sensors fabricated on their basis will have high selectivity and response to the presence of ultralow quantities of materials, e.g. metals included in salts and alkali, and this shows good promise for their use in chemistry, biology, medicine etc.

Keywords: Carbon nanotubes, nanosensors, adsorption, quantum-chemical calculations, density functional theory, boundary modification, carboxyl group.