СЕКЦІЯ XIII.
ЕЛЕКТРОНІКА ТА ТЕЛЕКОМУНІКАЦІЇ

PHOTOCONDUCTIVITY ANALYSIS OF CARBON NANOTUBES FUNCTIONALIZED WITH A CARBOXYL GROUP

Abaszade Rashad Gabil oglu
PhD, docent, Department of Electronics and Automations
Azerbaijan National Oil and Industry University, Azerbaijan

In recent years, quantum systems have been investigated as a new scientific direction in the world [10-11]. Getting graphene-based samples is even more interesting. Graphene oxide sample was obtained by Hummer method. Then, the physical and chemical properties of the obtained samples were investigated, as well as mathematical modeling of the obtained graphs was performed [1-9].

X-ray diffraction, Raman, and luminescence analyzes of gadolinium-doped carbon nanotubes are comprehensively investigated and the effect of doping on sample properties as well as their possible applications are shown [12-15].

The acquisition of these new smart materials is focused on intensive study of their physical and chemical as well as other properties. Therefore, the properties of nanosystems doped with different groups and characterized by new properties are more interesting. Of these functionalized groups, carboxyl is the most interesting. The photosensitivity spectrum of the carbon nanotube synthesized by electric arc method and functionalized with carboxyl group was studied in the range of 1-9V voltage and wavelength λ=400-900nm. The photoconductivity spectra of the samples measured at different voltages were constructed and a weaker photosensitivity was observed at 1V-voltage.

References:

1. A.Singh, A. Sharma, A. Ahmed, A.K. Sundramoorthy, H.Furukawa, S.Arya, A.Khosla, 2021. Recent Advances in Electrochemical Biosensors: Applications, Challenges, and Future Scope, Biosensors, 11, P.336. https://doi.org/10.3390/bios11090336.
2. V.M. Boychuk, R.I. Zapukhlyak, R.G. Abaszade, V.O. Kotsyubynsky, M.A. Hodlevsky, B.I. Rachiy, L.V. Turovska, A.M. Dmytriv S.V. Fedorchenko, 2022. Solution combustion synthesized NiFe2O4/reduced graphene oxide composite nanomaterials: morphology and electrical conductivity, Physics and Chemistry of Solid State, 23, No.4, P.815-824. https://doi.org/ 10.15330/pcss.23.4.815-824.
3. R.G. Abaszade, 2022. Synthesis and analysis of flakes graphene oxide, Journal of Optoelectronic and Biomedical Materials, 14, No.3, P.107–114. https://doi.org/10.15251/JOBM.2022.143.107.
4. R.G. Abaszade, S.A. Mamedova, F.H. Agayev, S.I. Budzulyak, O.A. Kapush, M.A. Mamedova, A.M. Nabiyev, V.O. Kotsyubynsky, 2021. Synthesis and Characterization of Graphene Oxide Flakes for Transparent Thin Films, Physics and Chemistry of Solid State, 22, No.3, P.595-601. https://doi.org/10.15330/pcss.22.3.595-601.
5. R.G. Abaszade, A.G. Mammadov, I.Y.Bayramov, E.A.Khanmamadova, V.O. Kotsyubynsky, O.A. Kapush, V.M. Boychuk, E.Y. Gur, 2022. Structural and Electrical Properties of the Sulfur-

Doped Graphene Oxide/Graphite Oxide Nanocomposite, Physics and Chemistry of Solid State, 23, No.2, P.256-260. https://doi.org/10.15330/pcss.23.2.256-260.
6. S.R. Figarova, E.M. Aliyev, R.G. Abaszade, R.I. Alekberov, V.R. Figarov, 2021. Negative Differential Resistance of Graphene Oxide/Sulphur Compound, Journal of Nano Research Submitted, 67, P.25-31. https://www.scientific.net/JNanoR.67.25.
7. R.G. Abaszade, A.G. Mammadov, V.O. Kotsyubynsky, E.Y. Gür, I.Y. Bayramov, E.A. Khanmamadova, O.A. Kapush, 2022. Modeling of voltage-ampere characteristic structures on the basis of grapheme oxide/sulfur compounds, International Journal on Technical and Physical Problems of Engineering, 14, No.2, P.302-306. http://www.iotpe.com/IJTPE/IJTPE-JournalIssues.html.
8. A.Singh, A. Ahmed, A. Sharma, S. Arya, 2022. Graphene and its derivatives: synthesis and application in the electrochemical detection of analytes in sweat, Biosensors, 12, P.910. https://doi.org/10.3390/bios12100910.
9. O.O. Voitsihovska, R.M. Rudenko, V.Y. Povarchuk, A.A. Abakumov, I.B. Bychko, M.O. Stetsenki, M.P. Rudenko, 2019. The effect of electron irradiation on the electrical properties of reduced graphene oxide paper, Materials letters, 236, pp.334-336, 2019. https://doi.org/10.1016/j.matlet.2018.10.119.
10. R.A. Namazov, R.G. Abaszade, "Properties of graphene based solar panels (review)", Ecoenergetics, No.1, pp.3-8, 2022. http://ieeacademy.org/wp-content/uploads/2022/05/ECOENERGETS-JOURNAL.
11. Kh.M. Popal, R.G. Abaszade, "Research and modeling of hybrid energy systems (review)", Ecoenergetics, No.1, pp.65-69, 2022. http://ieeacademy.org/wp-content/ uploads/2022/05/ECOENERGETS-JOURNAL.
12. R.G. Abaszade, O.A. Kapush, A.M. Nabiyev, 2020. Properties of carbon nanotubes doped with gadolinium", Journal of Optoelectronic and Biomedical Materials, 12, No.3, P.61–65. https://chalcogen.ro/107_AbaszadeRG.pdf.
13. R.G. Abaszade, O.A. Kapush, S.A. Mamedova, A.M. Nabiyev, S.Z. Melikova, S.I. Budzulyak, 2020. Gadolinium doping influence on the properties of carbon nanotubes, Physics and Chemistry of Solid State, 21, No.3, P.404-408.
14. A.G. Mammadov, R.G. Abaszade, V.O. Kotsyubynsky, E.Y. Gür, I.Y. Bayramov, E.A. Khanmamadova, O.A. Kapush, 2022. Photoconductivity of carbon nanotubes, International Journal on Technical and Physical Problems of Engineering, Issue 51, 14, No.3, P.155-160. http://www.iotpe.com/IJTPE/IJTPE-JournalIssues.html.
15. J.Wang, J. Han, X. Chen, X. Wang, 2019. Design strategies for two-dimensional material photodetectors to enhance device performance, InfoMat, 33, No.1, P.1-21.