

## Fluorescence Effect of Carbon Dots Modified with Silver Nanoparticles

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**Abstract :** Carbon dots (CDs) have great potential for application in many fields of science. They are characterized by fluorescent properties that can be manipulated. The nanomaterial has many advantages in addition to its unique properties. CDs may be obtained easily, and they undergo surface functionalization in a simple way. In addition, there is a wide range of raw materials that can be used for their synthesis. An interesting possibility is the use of numerous waste materials of natural origin. In the research presented here, the synthesis of CDs was carried out according to the principles of Green chemistry. Beet molasses was used as a natural raw material. It has a high sugar content. This makes it an excellent high-carbon precursor for obtaining CDs. To increase the fluorescence effect, we modified the surface of CDs with silver (Ag-CDs) nanoparticles. The process of obtaining CQD was based on the hydrothermal method by applying microwave radiation. Silver nanoparticles were formed via the chemical reduction method. The synthesis plans were performed on the Design of the Experimental method (DoE). Variable process parameters such as concentration of beet molasses, temperature and concentration of nanosilver were used in these syntheses. They affected the obtained properties and particle parameters. The Ag-CDs were analyzed by UV-vis spectroscopy. The fluorescence properties and selection of the appropriate excitation light wavelength were performed by spectrofluorimetry. Particle sizes were checked using the DLS method. The influence of the input parameters on the obtained results was also studied.

**Keywords :** fluorescence, modification, nanosilver, molasses, Green chemistry, carbon dots

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