

## Amalgam of first class silver nanoparticles on bio functionalized graphene oxide for successful antibacterial activity – Bolghar Rasoul, shahid Madani university

Bolghar Rasoul<sup>1</sup>

<sup>1</sup> shahid Madani university, Azarbaijan

Graphene-upheld metal nanoparticle composites as a half breed material have animated broad interest because of their synergistic and novel properties. A few systems have been created for the amalgamation of metal particles on graphene. In this work, Ag NPs was upheld onto GO sheets by means of joined cysteine. The antibacterial capability of silver nanoparticles in the graphene oxide nanocomposites with an altered surface by cysteine (rMGO-Ag) as an amino corrosive is the topic of conversation for this examination. Tests were set up with various union strategy that caused to the more modest size of Ag NPs onto the GO and caused to build proficiency and improve antibacterial property of nanocomposite. Graphene oxide (GO) is a potential material that gets intriguing with numerous applications, one of them is antibacterial treatment. The Procedures of antibacterial may occur GO traps bacteria while Ag destroys bacteria. Hence, the combination of GO and Ag NPs is an efficient material due to biocompatibility and antibacterial properties. Cysteine by having functional groups can act as modifier and reducing agent in the preparation of metal and graphene oxide nanocomposites. As well as its three kinds of functional group (-SH, -NH<sub>2</sub> and -COO-) can be a site for supporting heavy metal nanoparticles by non-covalent bonding. Cysteine can have two roles in rMGO-Ag nanocomposite: i) has ability to nucleophilic attack on rGO sheets with Amin functional group, ii) via thiol functional group, it has reducing potential to GO and moreover ability to establish Ag nanoparticles by noncovalent bond.

The antibacterial behavior of silver nanoparticles in the graphene oxide with a modified surface by Cysteine (rMGO-Ag) as an amino acid is the subject of discussion for this research. The resulted nanocomposite was fully characterized by different techniques, physical properties were confirmed by X-ray diffraction (XRD), zeta potential, dynamic light scattering (DLS), Fourier transform infrared (FTIR) spectra, transmission electron microscopy (TEM) and scanning electron microscopy (SEM).

Silver has a lot of present day modern uses and is viewed as a store of riches. Be that as it may, the narrative of this amazing valuable metal starts with its utilization by antiquated developments. Silver has numerous properties that made it so significant to early people groups. It is pliable, bendable, shiny, versatile, conductive, antibacterial, and uncommon. Additionally, it was utilized as a valuable product in monetary forms, adornments, gems, electrical contacts and photography, among others. In spite of the fact that mass silver is broadly known for their splendid surfaces and hues, there is an

extraordinary shading distinction when the metal decreases in measurements. Despite the fact that the skilled workers didn't know nanoparticles in that period, the blending of the metal chlorides with liquid glass prompted the development of metallic nanoparticles of various shape and size, in this manner the physical configurations of the metal nanoparticles had fascinating associations with light and delivered noticeably delightful hues. The metal chlorides emerged and framed nanoparticles in the liquid glass before cooling, making craftsmanship, one of the primary uses for nanotechnology. These days, the nanoparticles are a significant field of the advanced research managing plan, amalgamation, and control of molecule structures extending from around 1 to 100 nm. Nanoparticle investigate is as of now a territory of extraordinary logical research, because of a wide assortment of likely applications in fields, for example, human services, beautifiers, food and feed, ecological wellbeing, mechanics, optics, biomedical sciences, concoction ventures, hardware, space businesses, medicate quality conveyance, vitality science, optoelectronics, catalysis, single electron transistors, light producers, nonlinear optical gadgets, and photograph electrochemical region. The silver nanoparticles have been by and large used in the fields of science and related branches on account of their high surface to volume extent and grand coordinating limit. From electrical switches, daylight based sheets to compound making forces and antimicrobial activity, the silver nanoparticle is a principal fragment in various endeavors. Its unique properties make it about hard to substitute and its uses contain a wide extent of employments. At the same time, countless the customer things that assurance to contain nanomaterials contain nanosilver. Cases of the buyer things that fuse nanosilver including PCs, PDAs, vehicle machines, food packaging materials, food supplements, materials, equipment, nuclear family mechanical assemblies, excellence care items, clinical devices, imaging techniques, and water and condition disinfectants. Most of these nanosilver-containing things are created in North America, the Far East, especially in China, South Korea, Taiwan, Vietnam and India, the Russian Federation, and the Western Europe.