

There are a huge number of water pollutants; one of them is dyes. The method of removing the carcinogenic dyes is based on the adsorption-desorption equilibrium mechanism. Graphene oxide (GO) has pulled in the multidisciplinary examination in the most recent decade credited to its uncommon physicochemical properties. It is used for preparing five different polymeric adsorbents. These adsorbents were characterized by using various techniques, like Fourier transform infrared spectroscopy FTIR, Field emission scanning electron microscopy FESEM, and X-ray diffraction spectroscopy XRD, as well as analysis of the surface area, pore size, and specific pore volume by Brunauer Emmett Teller and Barrett Joyner Halenda (BET & BJH Analysis). Batch experiments were performed for studying adsorption systems of GO and its prepared composites towards Congo Red CR and Bismarck Brown BB toxic dyes, and they have appeared good response to adsorb from their aqueous solutions. Adsorption isotherms were determined using the Langmuir, Freundlich, Temkin, and Dubinin–Radushkevich models. The kinetic models, namely Pseudo-First-Order, Pseudo-Second-Order, and Intra-Particle Diffusion were employed to understand the mechanism of the adsorption process. Thermodynamic parameters were calculated and used to interpret the results and revealed that the adsorption systems were a spontaneous and endothermic process for GO and its composites. A study of the desorption process was applying for using prepared adsorbents several times while retaining its good adsorption capacity and observed that the desorption efficiency (S%) of GO is higher than that of GO-modified adsorbents.



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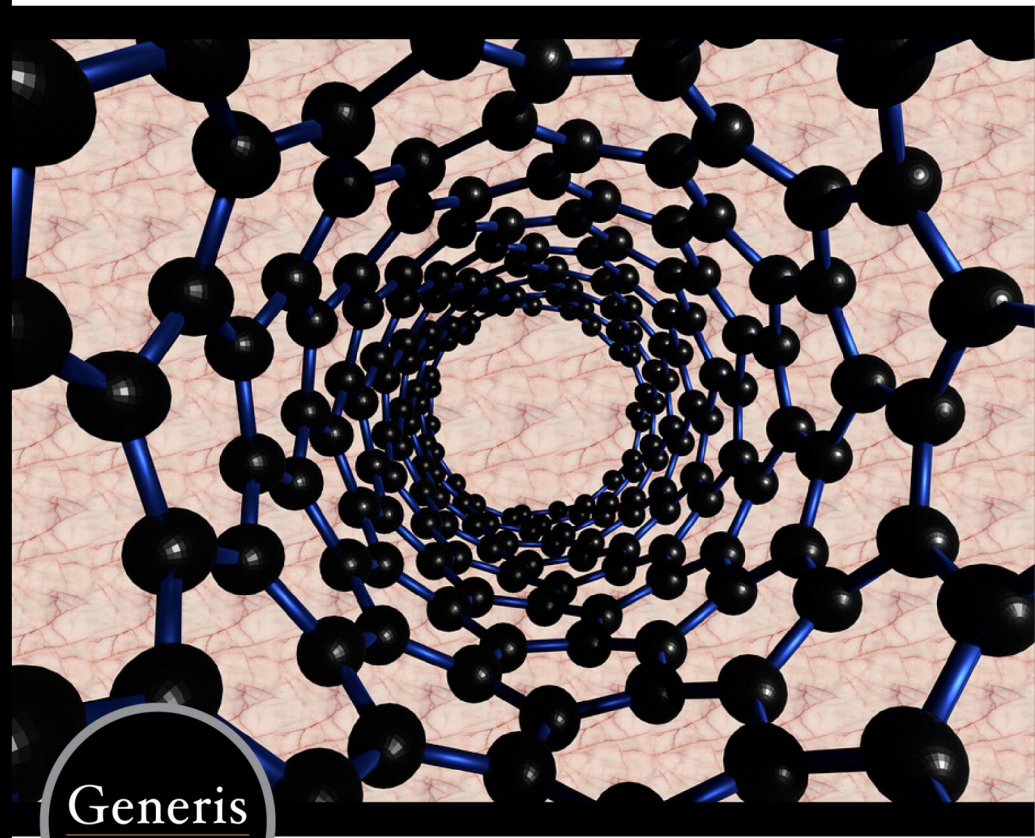
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