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# Fabrication of Magnetite-Functionalized-Graphene Oxide and Hexadecyltrimethyl Ammonium Bromide Nanocomposite for Efficient Nanosorption of Sunset Yellow

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## Abstract

A novel magnetic nanocomposite based on magnetite nanoparticles-functionalized-graphene oxide and hexadecyltrimethyl ammonium bromide has been synthesized (MAGO-CTAB) by a facile route for efficient, fast and sensitive binding with Sunset Yellow (SY). The MAGO-CTAB (27±3 nm) has been successfully characterized by transmission electron microscopy, X-ray diffraction, Fourier transform infrared spectroscopy and vibrating sample magnetization techniques. The influences of different experimental parameters on the % SY removal efficiency were fully investigated. The adsorption rates of SY by the MAGO-CTAB were conducted by fitting the experimental data to four kinetic models. Langmuir, Freundlich, Temkin, Dubinin-Radushkevich (D-R) adsorption isotherms were applied to study SY removal. The adsorption-desorption stability performance of the novel magnetic nanosorbent was evaluated and confirmed after five cycles. The designed MAGO-CTAB was successfully utilized for the removal of SY from different food and soft drink samples with excellent recoveries values (98–103%).

**Keywords:** Magnetic nanosorption; Sunset Yellow; Graphene Oxide; CTAB; Kinetic study; Isotherm modeling

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