

Abstract

The present research aims to investigate the production of a newly developed adsorbent, composed of magnetically modified graphene oxide (GO/Fe₃O₄) nanocomposite and explore the possible use for the extraction of chlorogenic acid. This study creates new opportunities for the environmentally friendly extraction and recovery of chlorogenic acid, which may be used in the food industry, the purification of medicines, and environmental monitoring. The magnetic characteristics of nanocomposites, which facilitate separation and recovery of various analytical samples, have attracted significant interest. To synthesize (GO/Fe₃O₄) nanocomposite, the graphene oxide was prepared by Hummer's method and then modified with Fe₃O₄ nanoparticles, which were synthesized by the solvothermal method. The produced nanocomposite underwent characterization using FTIR, photoluminescence, and UV-visible spectroscopy techniques, which confirmed the successful production of magnetically modified graphene oxide. After characterization, the newly synthesized adsorbent was used in the extraction of chlorogenic acid by the utilization of the solid phase extraction method. This study emphasizes how crucial interdisciplinary research in materials, advanced analytical chemistry, and technology is for the purification of essential chemicals. The HPLC results showed that concentration of Chlorogenic acid obtained from guava leaves, green coffee beans, and tobacco leaves extract is 2.1%, 4.2%, and 3.7%.