

Abstract

Graphene quantum dots (GQDs) are the rising stars in the race of invention of carbon-based nanomaterials and, owing to their unique structural and other captivating properties, they have attracted appreciable interest in different fields. Graphene quantum dots synthesized using simple bottom-up method showed low toxicity, bio-compatibility, excellent photo-stability, high fluorescence, outstanding photoluminescence, and photon-induced electron transfer ability. The citric acid was used as base chemical for the synthesis of GQDs using the simple bottom-up method. The citric acid was carbonized at 400 °C by keeping pH at 7 to prepare GQDs which were then co-precipitated with cobalt ferrite nanoparticles. The morphological, structural, optical, and magnetic properties were studied using FTIR, SEM, PL, UV-visible spectroscopy, and Fluorescence spectroscopy. The synthesized GQDs showed effective fluorescent properties at 317 nm to 391 nm, for the detection of different illicit drugs such as Heroin, cannabis resin, Diazepam, nicotine, and benzodiazepines.