A Facile Nanocomposite of Graphene Oxide Reinforced Chitosan/Poly-Nitroaniline Polymer as a Highly Efficient Adsorbent for Extracting Polycyclic Aromatic Hydrocarbons from Tea Samples

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Abstract : Tea is a popular beverage drunk by millions of people throughout the globe. Tea has considerable health advantages, in-cluding antioxidant, antibacterial, antiviral, chemopreventive, and anticarcinogenic properties. As a result of environmental pollution (atmospheric deposition) and the production process, tealeaves may also include a variety of dangerous substances, such as polycyclic aromatic hydrocarbons (PAHs). In this study, graphene oxide reinforced chitosan/poly-nitroaniline polymer was prepared to develop a sensitive and reliable solid phase extraction method (SPE) for extraction of PAH7 in tea samples, followed by high-performance liquid chromatography- fluorescence detection. The prepared adsorbent was validated in terms of linearity, the limit of detection, the limit of quantification, recovery (%), accuracy (%), and precision (%) for the determination of the PAH7 (benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, chrysene, benzo[b]fluoranthene, Dibenzo[a,h]anthracene and Benzo[g,h,i]perylene) in tea samples. The concentration was determined in two types of tea commercially available in Saudi Arabia, including black tea and green tea. The maximum mean of Σ7PAHs in black tea samples was 68.23 ± 0.02 ug kg-1 and 26.68 ± 0.01 ug kg-1 in green tea samples. The minimum mean of Σ7PAHs in black tea samples was 37.93 ± 0.01 ug kg-1 and 15.26 ± 0.01 ug kg-1 in green tea samples. The mean value of benzo[a]pyrene in black tea samples ranged from 6.85 to 12.17 ug kg-1, where two samples exceeded the standard level (10 ug kg-1) established by the European Union (UE), while in green tea ranged from 1.78 to 2.81 ug kg-1. Low levels of Σ7PAHs in green tea samples were detected in comparison with black tea samples.