

Sensitive determination of Tartrazine (E 102) based on Chitosan/Nanoparticles/MWCNTs Modified Gold Electrode in food and beverage products

Abstract

Food dyes can be categorized into natural and synthetic color. Tartrazine (E 102) which belong to the family of azo dyes and commonly used in food industry. Tartrazine imparts positive and negative benefits as well, by giving attractive physical appearance and consumer acceptance for over centuries. However, excessively intake of food Tartrazine can cause toxicity and pathogenicity to human. Due to arising of the health issues to mankind, researchers gave attentions for determination of Tartrazine by using analytical and advance methods. Currently, there are several analytical methods available, however, these methods are required skilled persons, time consuming and high cost. Herein, an electrochemical sensor was developed based on the combination of nanomaterials (chitosan, calcium nanoparticles and multiwall carbon nanotubes) for detection of Tartrazine. Electrochemical behavior of the modified gold electrode in the presence of Tartrazine was studied by using cyclic voltammetry and differential pulse voltammetry. Under optimal conditions, the DPV was detected with different concentrations of Tartrazine in the range of 0.1 to 10 ppm, with low detection limit (3.3s/s).