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ELECTROCHEMICAL SYNTHESIS OF POLY(3,4-ETHYLEDIOXYTHIOPHENE) ON TERBIUM HEXACYANOFERRATE FOR SENSITIVE DETERMINATION OF TARTRAZINE IN VARIOUS FOOD SAMPLES

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Tartrazine (Tz) ($C_{16}H_{9}N_4Na_3O_9S_2$) is a kind of bright yellow azo food coloring dye and this synthetic food dye is the derivative of coal-tar and nitrous. It is widely used in many foods, medications, personal care and cosmetics products etc. Hence, it is considered as an important coloring dye and also many countries listed the Tz as a permitted food dye. Though it was permitted worldwide, the usage must be limited due to the serious side effects such as asthma, thyroid cancer, permanent DNA damage, and itching etc. Therefore, the effective techniques are required in food safety department for evolving the determination of Tz to avoid serious allergies. Abundant methods have been followed for the detection of Tz including, HPLC, stopped-flow analysis, spectrophotometry method, and fluorescence method. Among these all, the electrochemical technique is more significant and substantial attractive technique owing to its inexpensive diagnostic tools, easy sample preparation, high sensitivity, long-term stability, reproducibility and high selectivity in sensing of

analytes. Hence, we prepared an electrochemically deposited poly(3,4-ethylenedioxythiophene@Terbium hexacyanoferrate (PEDOT@TbHCF) on glassy carbon electrode (GCE) matrix for electrochemical determination of Tz. Fortunately, the prepared PEDOT@TbHCF/GCE was found as an efficient electrode for electrochemical oxidation of Tz. The calculated linear ranges (0.1 μM to 206 μM), the low detection limit and sensitivity were calculated to be 0.032 $\mu M L^{-1}$ and 1.24 $\mu A \mu M^{-1} cm^2$, respectively. Finally, PEDOT@TbHCF/GCE modified electrode determine the Tz from real samples (soft drink, chips, candy and jelly) also. As the result, the recovery values was found as 98% to 101%, it is suggesting that PEDOT@TbHCF/GCE modified electrode is more suitable to detect Tz in real samples also. We concluded that the reported PEDOT@TbHCF/GCE is a promising sensor for selective, sensitive electrochemical determination of Tz with low detection limit.

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