Facile Synthesis of Zinc Cobaltate Nano flakes: An enhanced Electrochemical detection of Organic Pollutant 4-Nitrotoluene

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The current work, we have demonstrate an electrochemical determination of 4-nitrotoluene (4-NT) based on zinc cobaltate nanoflakes (ZnCo₂O₄; ZnC Nfs) The ZnC Nfs was synthesized by simple Co-precipitation method and its physicochemical properties were systematically studied with various analytical and spectroscopic techniques such as XRD, FESEM and EDX. Moreover, the proposed ZnC Nfs modified with Screen-printed carbon electrode (SPCE) after that directly used for the electrochemical determination (4-NT). The ZnC/SPCE shows an excellent electrochemical activity for the (4-NT) detection. The as prepared ZnC Nfs provide a highly selective and sensitive electrocatalyst for the (4-NT) determination with good linear range response 0.05μM- 385.5μM and low detection limit 0.044μM. The ZnC/SPCE electrochemical sensor established the outstanding selectivity, well stability and reproducibility.

Keywords: Electrochemical sensor, Organic pollutant, Co-precipitation, ZnCo₂O₄ nanoflakes, 4-NT.

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