Electrochemical Study and Determination of Thiophene by Cobalt Oxide Nanoparticle Modified Glassy Carbon Electrode

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Thiophene is one of the most important sulfur-containing compounds in crude oil as pollutants. The sulfur-containing compounds in crude oil include sulfides, thiols, thiophenes, dibenzothiophenes (DBT) and many considerably more complex molecules [1]. Many research effort have been put into the investigation of ways for desulfurization and also determination of sulfur-containing compounds in various media [2,3,4]. In this research, the electrochemical behaviour of thiophene on bare and modified GC electrode were used as working electrode in electrochemical determination of thiophene by Cyclic Voltametry (CV) and amperometry techniques were investigated. The kinetics of the electrooxidation of bare and modified GC electrode was investigated by CV and chrono amperometry methods. It was shown that by using the modified electrode, thiophene can be determined by Chrono Amperometry.

The results showed that in the presence of nanoparticles of cobalt oxide, anodic current of thiophene increased. Increasing of anodic current of thiophene caused to decrease in detection limit.

In this work, the experimental conditions such as scan rate, concentration, polishing the electrode and etc. has been optimized.

**Figure 1.** CVs recorded in solution of Thiophene 0.01 M with TBABF₄ as supported electrolyte in scan rate 100 mv/s upon GC electrode before and after modification in first cycles.

**References**


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