

# Electrodeposition of Cu<sub>2</sub>O thin film on titanium substrat and its application in the oxidation of ascorbic acid

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## Abstract:

Cuprous oxide (Cu<sub>2</sub>O) thin film is fabricated by means of electrochemical deposition on titanium substrat from an acetate solution and is introduced for the efficient oxidation of ascorbic acid (AA).

Surface morphology and composition of the resulted electrode (Cu<sub>2</sub>O/Ti) were studied by means of SEM, EDX and DRX. The Electrochemical study was realised by cyclic voltammetry and chronoamperometry and shows that Cu<sub>2</sub>O/Ti electrode exhibited a high catalytic activity towards AA oxidation with good sensitivity and selectivity. The proposed electrode has wider linear range, low detection limit, good reproducibility and stability. When compared with bare titanium electrode, a large decrease in AA oxidation overpotential is observed at the Cu<sub>2</sub>O/Ti modified electrode surface. The catalytic oxidation peak current showed a linear dependence on the ascorbic acid concentration and a linear calibration curve was obtained in the range 0.01 - 5 mM of ascorbic acid with a correlation coefficient of 0.9953 and good sensitivity. The detection limit (2σ) was determined and found to be equal to (5.48 10<sup>-5</sup> M).

**Keywords:** Electrodeposition; Cu<sub>2</sub>O; Titanium; Ascorbic acid; oxidation; Electrocatalysis