

## Electrochemical Determination of Caffeine Content in Ethiopian Coffee Samples Using Lignin Modified Glassy Carbon Electrode

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**Abstract :** Lignin film was deposited at the surface of the glassy carbon electrode potential-statically. In contrast to the unmodified glassy carbon electrode, an oxidative peak with an improved current and overpotential for caffeine at the modified electrode showed catalytic activity of the modifier towards oxidation of caffeine. Linear dependence of peak current on caffeine concentration in the range  $6 \times 10^{-6}$  to  $100 \times 10^{-6}$  mol L<sup>-1</sup> with determination coefficient and method detection limit (LoD = 3 s/slope) of 0.99925 and  $8.37 \times 10^{-7}$  mol L<sup>-1</sup>, respectively, supplemented by recovery results of 93.79-102.17%, validated the developed method. An attempt was made to determine the caffeine content of aqueous coffee extracts of Ethiopian coffees grown in four coffee cultivating localities (Wonbera, Wolega, Finoteselam, and Zegie) and hence to evaluate the correlation between users preference and caffeine content. In agreement with reported works, caffeine contents (w/w%) of 0.164 in Wonbera coffee; 0.134 in Wolega coffee; 0.097 in Finoteselam coffee; and 0.089 in Zegie coffee were detected, confirming the applicability of the developed method for determination of caffeine in a complex matrix environment. The result indicated that users' highest preference for Wonbera and least preference for Zegie cultivated coffees are in agreement with the caffeine content.

**Keywords :** electrochemical, lignin, caffeine, electrode

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