

Anthocyanin Modified Carbon Paste Electrode for  
Determination of Copper Ions at Trace Levels

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Copper is an essential element not only for life in mammals but also for plants and lower forms of organisms. In natural water and biological samples its level is low, therefore effective procedures for determining trace copper in such samples are highly desired. Electrochemical determination of metal ions is relatively inexpensive and is one of the most sensitive and selective techniques in the determination of trace amount of metal at natural levels. Plants may be the source of a cost effective technology for the determination of environmental contamination due to their natural capacity to accumulate heavy metals. Anthocyanin extracted from black rice was used as modifier for carbon paste electrode for voltammetric determination of copper ions in aqueous samples. Different parameters like electrode composition, different electrolytes, electrolyte concentration, pH value, deposition time and deposition potential were optimized. Best results were obtained using 15  $\mu\text{L}$  of modifier, hydrochloric as supporting electrolyte, -0.6 V deposition potential, and 10 min deposition time. Linearity was observed in the range 250  $\mu\text{g/L}$  to 1000  $\mu\text{g/L}$ . The limit of detection was found to be 125.32  $\mu\text{g/L}$  and limit of quantification, 417.7  $\mu\text{g/L}$ . Enhancement in sensitivity was observed for the fabricated sensor as compared to the unmodified carbon paste electrode.

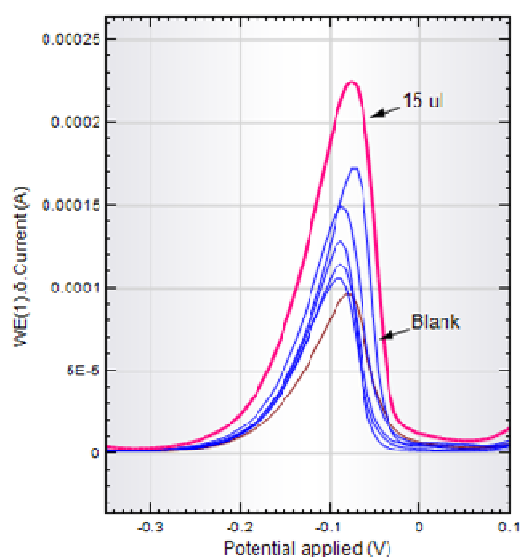


Figure: Enhancement in sensitivity with Anthocyanin modified carbon paste electrode as compared to unmodified carbon paste electrode

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