

POTENTIAL OF BANANA (*Musa sp.*) PEELS AS SOURCE OF ELECTROLYTES IN VOLTAMMETRIC EXPERIMENTS

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Banana (*Musa sp.*) is an electrolyte-rich fruit due to its high potassium content. Even though banana peel is considered a waste material, many studies have shown that it can be converted into value-added products. The ability of banana peels to function as electrolytes has not been extensively studied. This study aimed to explore the potential of banana peel extract as an alternative for expensive electrolytes utilised in electrochemical experiments. Extractions of three banana varieties: *Ambun*, *Embul*, and *Seeni* were prepared by blending and filtering the fresh peels. The electrical conductivity (EC) and total dissolved solids (TDS) in three extracts were determined using an electrical conductivity meter. *Ambun* peel extracts showed both the highest EC and highest TDS results. The mineral ion concentrations (Mg^{+2} , Ca^{+2} , Na^+ , K^+) of three types of banana peel extracts were also determined with the flame atomic absorption spectrophotometer using a diluted extract series to confirm the presence of major electrolytes. In cyclic voltammetry (CV) experiments, baseline response of the banana peel extract was first investigated, and then cyclic voltammograms were recorded for $0.001 \text{ mol dm}^{-3}$ ferrocene in dimethylformamide using banana peel extract as the supporting electrolyte with glassy carbon electrode as the working electrode; Pt wire as the counter electrode and calomel electrode as the reference electrode under N_2 blanket. The results have exhibited the characteristic redox peaks of ferrocene with cathodic peak potential (E_{pc}) at 0.23 V and anodic peak potential (E_{pa}) at 0.38 V for at 0.050 V s^{-1} scan rate. Anodic and cathodic current ratio (i_{pa}/i_{pc}), was 2.36 and peak separation (ΔE_p) was 0.15, which was higher than the results in a solution of a standard supporting electrolyte. None of these redox peaks of ferrocene was observed in the absence of banana peels extract. The results reveal that banana peels can be used as a source of electrolytes in CV experiments. Attempts were made to convert the extraction of the peel into a solid because solid electrolytes are more appropriate in electrochemical experiments. Further research on the development of solid electrolytes is underway.

Keywords: *Ambun* banana, Banana peel extract, Cyclic voltammetry, Electrolytes, Ferrocene