Assessment Of Organic Acid-Rich Bio-Sap To Generate Electricity

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ABSTRACT

The study has focused on electricity generation from organic acid-rich bio-substrate like star fruit (Averrhoa carambola). The sap of star fruit was selected as an electrolyte due to the presence of significant amounts of organic acids such as citric acid and ascorbic acid. To preserve the sap, 2% phenol by volume was used to reduce the growth of microorganisms, and the addition of phenol did not affect the initial pH. It was observed that due to an increase in the electrode surface area, reaction rate and current generation had been amplified. Internal resistance also decreased rapidly because of the large electrode surface area. Furthermore, internal resistance was the significant barrier in electricity generation, which was also successfully controlled by the baffle flow agitation system. Moreover, the baffle flow agitation system reduces the formation of dead zones and increases the total dissolved solids inside the electrochemical cell compartments during operation.

KEYWORDS: bio-electrochemical cell, star fruit, bio-electricity, acid-rich sap, baffle agitation

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