Garbage Fermentation Fuel Cell: Participant of Electricity Generation and Soil Pollution Control

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ABSTRACT: Human are facing an alarming situation in terms of energy crisis and the continuous destruction of the natural environment due to pollution. According to World Bank solid waste management report, (2016) 2.01 billion tons of solid waste generated worldwide yearly which will increase by 70% in 2050. To address this issue, it will leads an idea of designing a garbage fermentation fuel cell in which the solid organic waste material including decayed fruits, vegetables, Household garbage, dead leaves and Bagasses were used after fermentation through traditional means followed by transference of fermented products to single chambered Microbial Fuel Cell in order to assess the charge or electron emission during oxidation of organic matter by soil bacteria. To check the efficient metallic electrode, comparative analysis of copper with graphite were assessed separately and found that graphite showed maximum current generation using the nursery soil i.e., 6.714 ×10-4 as compared to the copper. As 1kg of decayed fermented fruits generated 5480mVolt and current 7.82×10-4 ampere and it increased with the passage of time. It means that more the fermented products more charged or electrons will be produced by exposing microbes to organic matter in an isolated system. On the basis of these findings, it was recommended that the organic solid waste dumping area can be replaced by Garbage fermenter fuel cell by digging deep down pit to promote fermentation followed by a compartment in which electrodes and capacitors for charge storage will be placed for generating electricity and byproducts will be utilized as organic fertilizer and biogas.

Awards Won:
University of Arizona: Renewal Tuition Scholarship
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