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Patent Search

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Abstract:

The proposed invention presents a microbial fuel cell (MFC) system integrated with bio batteries to enhance performance. The MFC system enables direct electron transfer from microorganisms to bio battery electrodes, increasing power output and efficiency. Microorganisms, either individually or in engineered consortia, oxidize organic matter at the anode compartment, generating electrons. These electrons flow through an external circuit to the cathode, creating an electric current. The integration of MFCs into bio batteries offers improved charge and discharge rates, utilizing enzymatic mediators and nanostructured catalysts. Furthermore, the system promotes waste treatment and resource recycling, utilizing organic waste materials as fuel sources. The invention also introduces a hybrid energy storage system combining MFCs with lithium-ion batteries for efficient energy storage.

Complete Specification

Description:The proposed invention introduces a novel system called the Microbial Fuel Cell (MFC) for enhancing the performance of bio batteries. By harnessing the activity of microorganisms, this innovative technology aims to revolutionize the field of renewable energy and biotechnology. The MFC employs microbial metabolism to convert organic matter directly into electricity, thereby offering a sustainable and efficient solution for powering various applications.

Background of the invention:

The quest for sustainable and eco-friendly energy sources has become increasingly crucial in recent years. As traditional fossil fuel reserves dwindle and concerns about climate change and environmental degradation escalate, researchers and scientists have turned their attention towards alternative energy solutions. Among these alternatives, bio batteries have emerged as promising options due to their ability to generate electricity from organic materials.

Bio batteries utilize the enzymatic activity of microorganisms to convert organic compounds into electrical energy. However, one of the major challenges faced by bio batteries is their limited power output and efficiency. To overcome these limitations, the proposed invention, the Microbial Fuel Cell (MFC) for Enhanced Bio Battery Performance, seeks to enhance the efficiency and power generation capabilities of bio batteries by incorporating microbial fuel cells.

Microbial fuel cells are bioelectrochemical devices that employ the metabolic activities of microorganisms to convert chemical energy present in organic matter into electrical energy. They consist of an anode and a cathode separated by a proton exchange membrane. In the anode compartment, microorganisms, such as bacteria, oxidize organic compounds and release electrons and protons. The electrons travel through an external circuit towards the cathode, creating an electric current.

Meanwhile, the protons migrate across the membrane to the cathode, where they combine with the electrons and a final electron acceptor (e.g., oxygen) to complete the circuit.

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