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Microbial fuel cell - generating electricity from waste

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Microbial fuel cells (MFCs) are devices that use microorganisms as catalysts to oxidize organic and inorganic matter to generate electricity. They have the potential for sustainable energy production, waste disposal and reducing CO_2 emissions. It is known that electron transfer between the bacterial catalysts and the anode is low, leading to a high internal resistance that reduces the power generated in MFCs. A laboratory-scale H-shaped *Pseudomonas* catalyzed microbial fuel cell (MFC) was investigated for its performance in decolourizing synthetic wastewater containing azo dyes. The azo-dyes investigated in this study were methyl orange (MO), Congo red, reactive blue 172 (RB), reactive yellow 145, and reactive red 2. Among the azo dyes in anode chamber MO resulted in the highest power density (4100 $\mu W/m^2$) with graphite electrodes and a decolourization efficiency of 94%. The azo bonds were cleaved in all the dyes tested, and their metabolites in the anolytes were characterized by UV-visible spectral and HPLC analyses. To reduce the internal resistance of MFC and maximize the power density, different metal salt doped graphite epoxy composites were tested. In the case of azo dyes MO and RB, the power output increased substantially (almost 1.2 fold) when using Mn^{2+}.

Biography:

Dr J Jayapriya is currently working as Associate professor in Department of Applied science and Technology, AC Tech, Anna University, Chennai, India. She has a B. Tech and M. Tech in Chemical Engineering and completed PhD in the arena of Microbial fuel Cells. She has around 15 years of research and teaching experience. She has more than 20 research papers and research interest is in fuel cells, Air dispersion Modeling, Water treatment and Microbial Corrosion.