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Graphene: A promising electrode for microbial fuel cells

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Microbial fuel cells (MFCs) are promising sustainable technology for electricity production from waste organic matter. The anode employed for this purpose plays a major role in the performance of the MFC system. The coating of graphene on stainless steel has been investigated in this study for improving the performance of an anode in a MFC system. The use of graphene coating on a stainless steel (SS-316) plate produced a maximum power density of 201 mWm⁻², while a bare stainless steel plate only gave a maximum power density of 100 mWm⁻². The use of graphene coating on copper foil gave even higher maximum power density of 262 mW/m². The maximum open circuit potentials observed were 0.95 V, 1.0 V and 1.12 V for SS anode, SS anode with graphene and copper foil with graphene, respectively. The system internal resistance of pristine stainless steel, graphene-stainless steel and copper-graphene anodes were 43±4 Ω, 42±1 Ω and 36±5 Ω, respectively.

Biography

Jayesh M Sonawane is Research Scholar from Indian Institute of Technology, Bombay, India and Monash University, Melbourne, Australia. He is working on bio-electrochemical system viz, power generation from microbial fuel cells, hydrogen generation from waste organic matter. He has filed patent on Air Conditioning Technology and Advanced Water Purification. Recently, he was awarded Gandhian Young Technological Innovation Award. He is also working for modernization of Indian Railways.

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