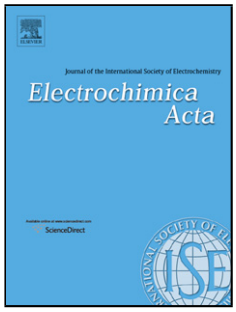

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Titanium dioxide nanoparticles modified three dimensional ordered macroporous carbon for improved energy output in microbial fuel cells

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Highlight

- The nanocrystal TiO_2/3DOM-C hybrid anode was fabricated for MFC anode.
- The biocompatible TiO_2 and the 3D macroporous structure promoted the growth of the microbes.
- The TiO_2/3DOM-C modified CC anode delivered 2.3-folds power density comparison to CC anode.

Abstract

Pore structure and surface biocompatibility are crucial factors for microbial fuel cell (MFC) anode performance. In this study, we demonstrated a templating strategy for design of three dimensional ordered porous carbon (3DOM-C) well-patterned macrospores (*ca*, 400 nm) decorated carbon cloth as anode for high power density MFC. Titanium dioxide nanoparticles (TiO_2) were synthesized to modify the 3DOM-C for increasing biocompatibility. The results of SEM, X-ray diffraction, and nitrogen adsorption-desorption studies demonstrated the hybrid composite had a honeycomb structure with uniform macroporous distribution and high specific surface area. In