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#### **ACCEPTED MANUSCRIPT**

# Quick Start-up and Performance of Microbial Fuel Cell Enhanced with a Polydiallyldimethylammonium Chloride Modified Carbon Felt Anode

Dengjie Zhong<sup>a</sup>, Xinrong Liao<sup>a</sup>, Yaqi Liu<sup>a</sup>, Nianbing Zhong<sup>b</sup>, YunlanXu<sup>a</sup>\*

<sup>a</sup>School of Chemical Engineering, Chongqing University of Technology, Chongqing 400054, China

<sup>b</sup>School of Electrical and Electronic Engineering, Chongqing University of

Technology, Chongqing 400054, China

#### Abstract:

It is of significant importance to simultaneously shorten the start-up time and enhance the electricity generation performance for practical application of microbial fuel cell (MFC). In this paper, the polydiallyldimethylammonium chloride (PDDA) modified carbon felt (PDDA-CF) electrode was prepared and used as the anode of PDDA-MFC. The anode significantly enhanced the start-up speed and electricity generation and dye wastewater degradation performances of the PDDA-MFC. The start-up time of PDDA-MFC is only 9 h, which is only 7.5 % that of the unmodified carbon felt anode MFC (CF-MFC). The charge transfer resistance, the maximum output voltage and the maximum output power density of PDDA-MFC were 9.7  $\Omega$ , 741 mV and 537.8 mW·m<sup>-2</sup> respectively, which were 70.3% lower than, 1.7 times and 3.3 times greater than those of CF-MFC respectively. In addition, the color and chemical oxygen demand (COD) removal rates of Reactive Brilliant Red X-3B for PDDA-MFC reached 95.94 % and 64.24 % at 24 h respectively, which were 41.5 % and 51.2 % Download English Version:

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