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**Enhanced Electricity Generation Performance and Dye Wastewater
Degradation of Microbial Fuel Cell by Using a Petaline NiO@
Polyaniline-Carbon Felt Anode**

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Abstract: A new electrode which embedded polyaniline (PANI) in petaline NiO (NiO@PANI-CF) was prepared through in-situ growth and in-situ polymerization. The NiO@PANI-CF integrated the high capacitive character of NiO and the high conductivity of PANI, which effectively increased electricity generation capacity of NiO@PANI-MFC. The maximum output power density and the charge transfer resistance of NiO@PANI-MFC were $1078.8 \text{ mW}\cdot\text{m}^{-2}$ and 10.4Ω respectively, which were 6.6 times and 68 % lower than that of CF-MFC respectively. Moreover, NiO@PANI-MFC could effectively biodegrade dye wastewater due to high biocompatibility of NiO@PANI-CF. The color and COD removal efficiencies of Reactive Brilliant Red X-3B reached 95.94 % and 64.24 % at 48 h respectively. The results demonstrate that the NiO@PANI-CF has the advantage of high conductivity, high capacitance, high specific surface area, super hydrophilicity, low polarization performance, low charge transfer resistance, high biocompatibility and high stability.

Keywords: Microbial fuel cell, NiO, Polyaniline, Anode, Electricity generation, Dye wastewater

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