

Supporting Information

Positive effects of concomitant heavy metals and their redoxates on hexavalent chromium removal in microbial fuel cells

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TEXT (1)

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Methods

1. Transmission electron microscopy (TEM)

The biogenic Au nanoparticles were prepared on carbon-coated copper grids and observed by using a TEM (JEM-2100, JEOL, Japan).

2. X-ray diffraction (XRD)

The biogenic Au nanoparticles were identified on X-ray diffractometer (Smartlab TM 9KW, Japan) with Cu K α radiation. The dried Bio-Au powder was scanned between 5° to 80° 2 θ .

3. Optimization of Cr(VI)/Cu(II) concentration ratio

As the initial concentration of Cr(VI) was set at 100 mg/L in the catholyte, different Cr(VI)/Cu(II) concentration ratios (2:1, 1:1, 1:2, 1:4) were investigated regarding of the Cr(VI) removal in MFCs. In this section, all experimental MFCs were connected to an external resistance of 1000 Ω .

4. Optimization of external resistance

Different external resistances (10, 510, 1000, 2000 Ω) were investigated regarding of the Cr(VI) removal in MFCs. In this section, the catholyte in all experimental MFCs contained Cr(VI) of 100 mg/L and Cu(II) of 400 mg/L (the Cr(VI)/Cu(II) concentration ratio in catholyte was set at 1:4).

5. Element analysis of electrode surface

The element contents of the BioAu/MWCNT electrode surface before operation were analyzed by scanning electron microscopy with coupled energy dispersive spectroscopy (SEM-EDS, Hitachi S-4800, Japan).

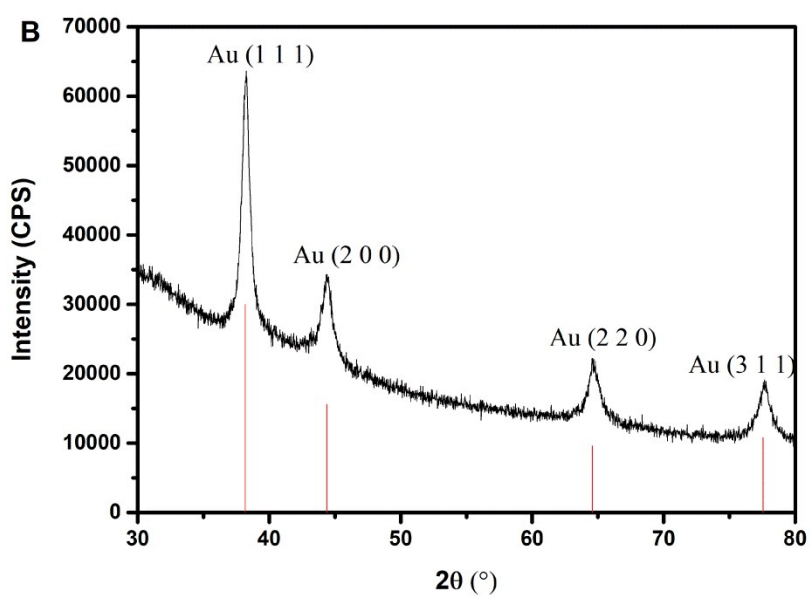
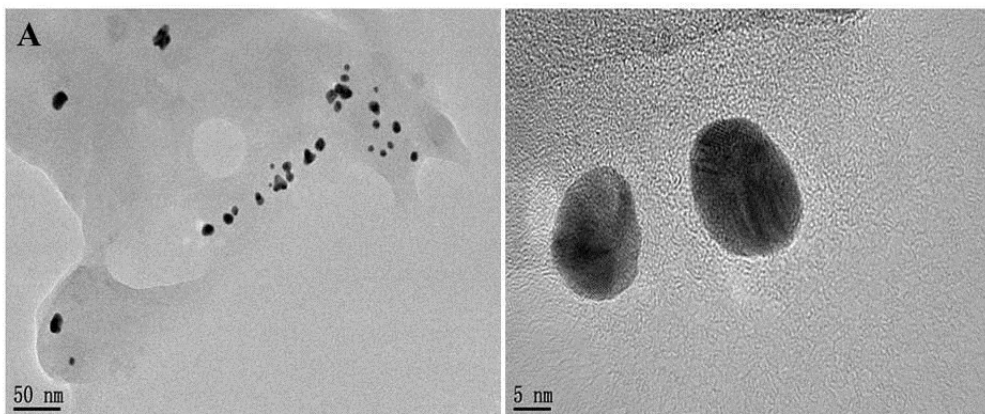


Fig. S1. TEM images (A) and powder XRD patterns (B) of the biogenic Au nanoparticles.

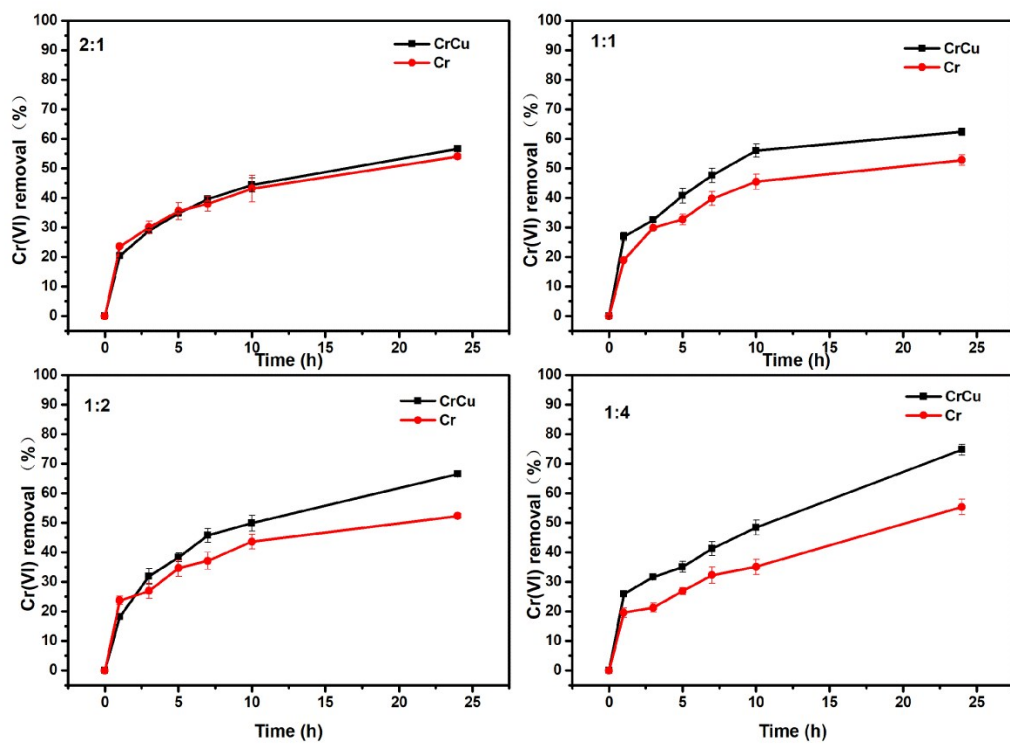


Fig. S2. The Cr(VI) removal of MFCs with different Cr(VI)/Cu(II) concentration ratios.

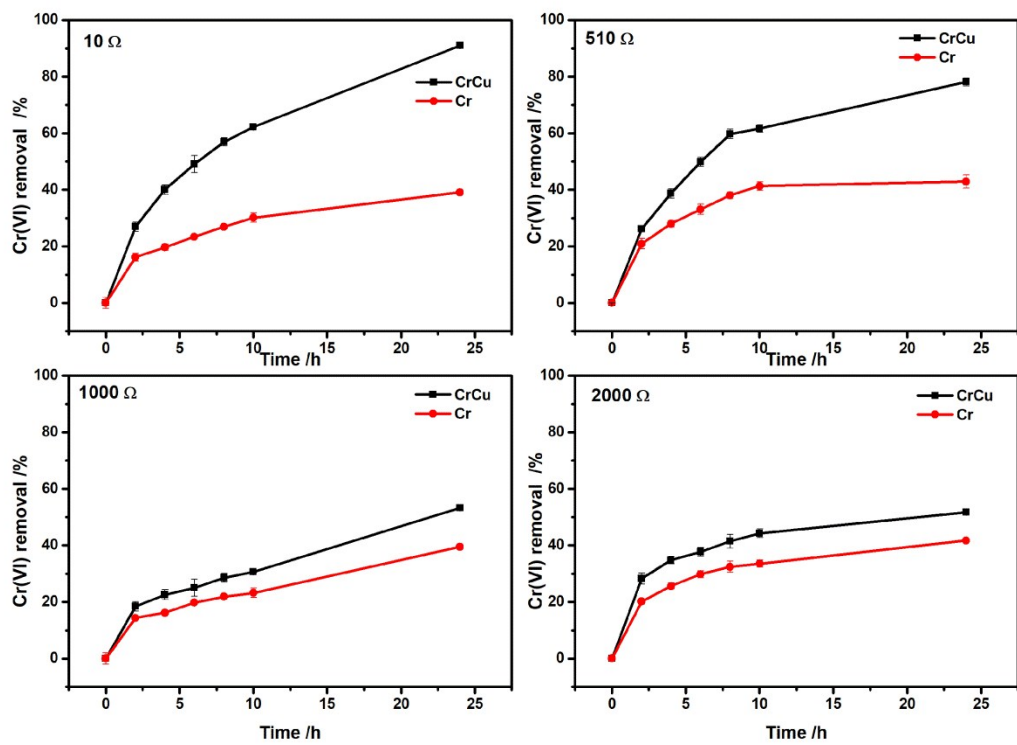


Fig. S3. The Cr(VI) removal of MFCs with different external resistances.

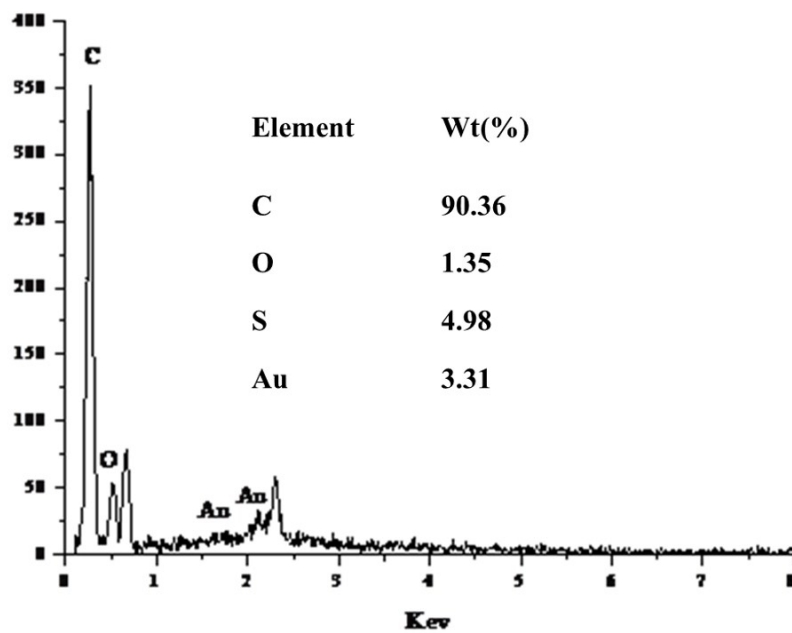


Fig. S4. The analysis of element contents by EDS on the BioAu/MWCNT electrode surface before operation.