

- Supporting Information -

A Novel and High Performance Activated Carbon Air-cathode with Decreased Volume Density and Catalyst Layer Invasion for Microbial Fuel Cells

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Table S1 R_s , R_{ct} and capacitance at OCP with four different cathodes.

Element	G-D	G-S	C-D	C-S
Surface density of GDL /g·cm ⁻²	0.077	0.078	0.077	0.078
Surface density of CL/g·cm ⁻²	0.045	0.045	0.049	0.047
Volume density of GDL/g·cm ⁻³	1.46	1.04	1.57	1.06
Volume density of CL/g·cm ⁻³	0.76	0.65	0.77	0.65
R_s/Ω	10.7	10.6	10.8	10.7
R_{ct}/Ω	13.3	8.4	11.4	1.5
$Q_{dl}/10^{-5}\Omega^{-1}s^{1/2}cm^{-2}$	7.1	9.2	8.2	7.5
R_d/Ω	2.8	2.7	1.3	0.5

Table S2 Linear fit equations and exchange current densities calculated from the linear region of the Tafel plots.

Air-cathodes	Fit linear equation	R ²	j_0 (Am ⁻²)
G-D	y = 4.3963x-0.20471	0.99	0.624
G-S	y = 3.0164x+0.04487	0.99	1.109
C-D	y = 3.9846x-0.13802	0.99	0.728
C-S	y = 2.7518x+0.09972	0.99	1.258

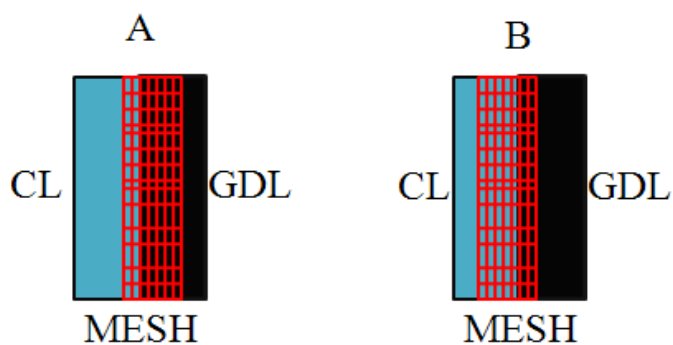


Fig.S1 GDL invaded cathodes with GDL rolling onto SSM firstly (A) and CL invaded cathodes with CL rolling onto SSM firstly (B).

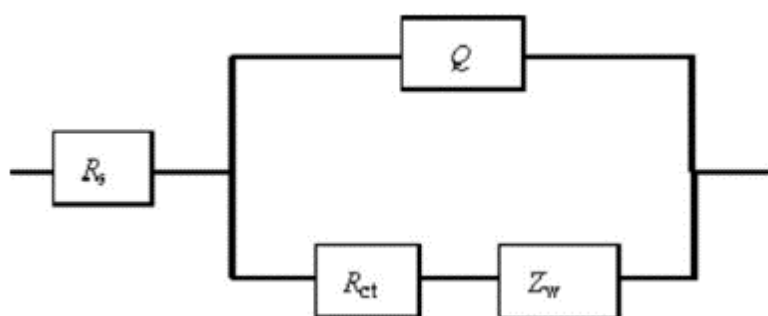


Fig.S2 Equivalent circuits for modeling the EIS of air-cathodes.

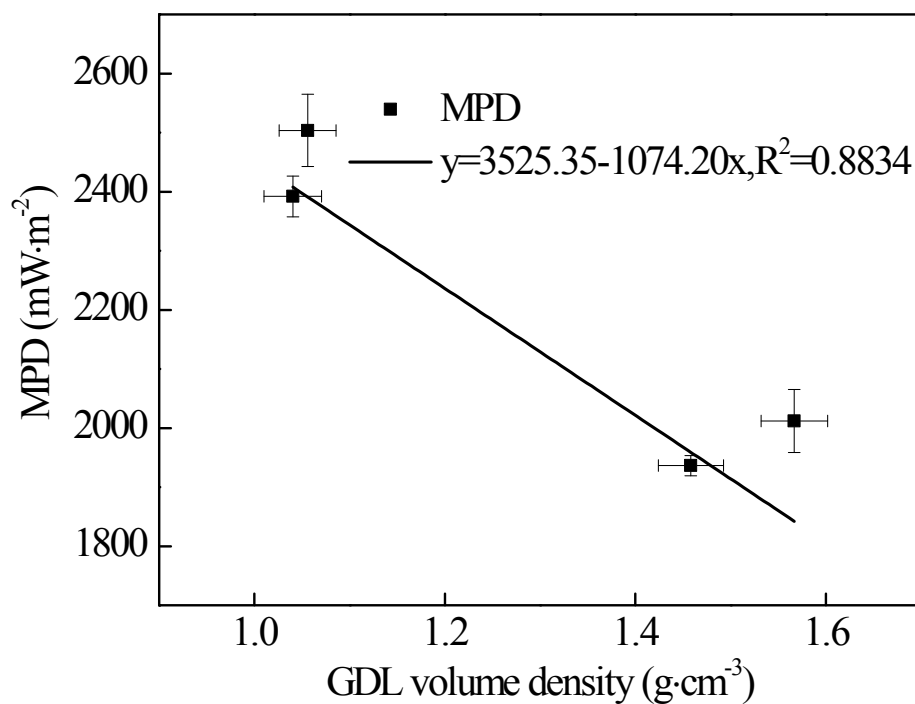


Fig.S3 Fitting relationship between the volume density of GDL and the MPD of MFCs.

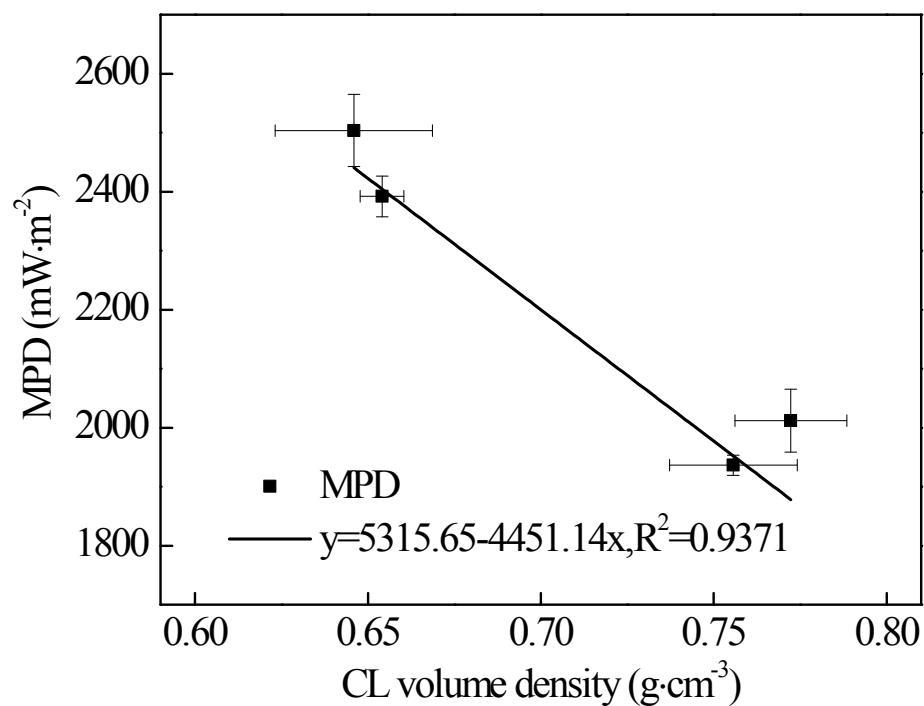


Fig. S4 Fitting relationship between the volume density of CL and the MPD of MFCs.

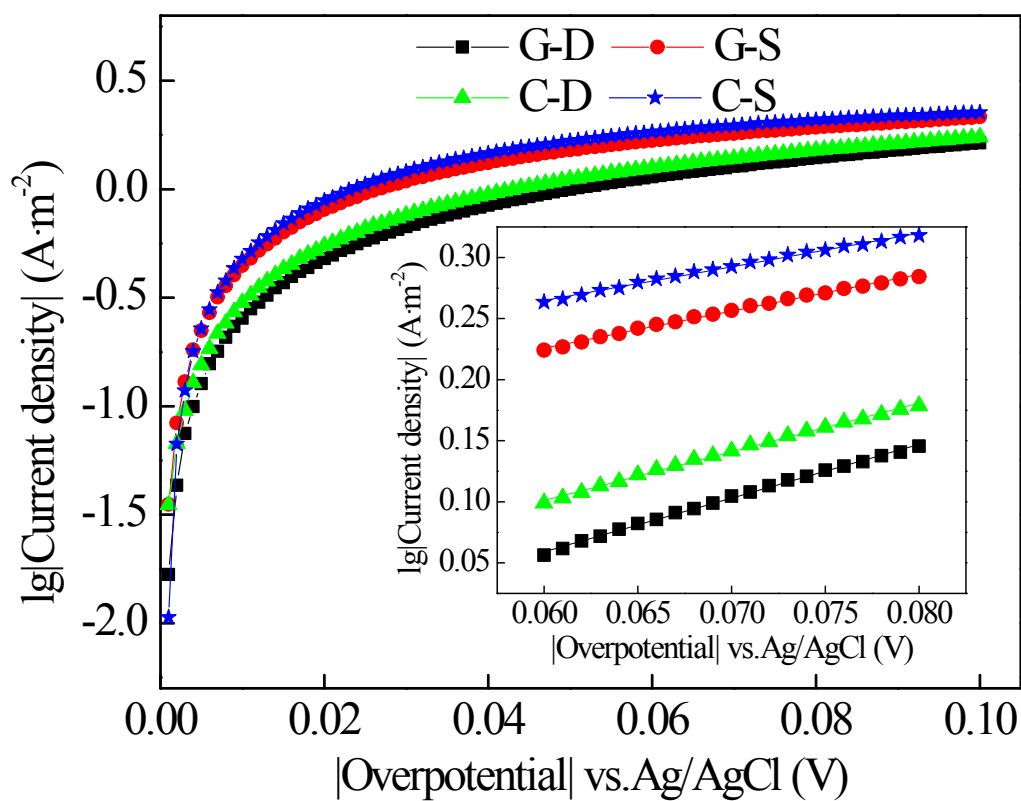


Fig.S5 Tafel plots of the four different air-cathodes. The inserted figure is the linear fit for the Tafel plots over the overpotential from 60 mV to 80 mV.