SUPPLEMENTARY DATA

Addition of Acetate Improves Stability of Power Generation Using Microbial Fuel Cells Treating Domestic Wastewater

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Reactor setup and information

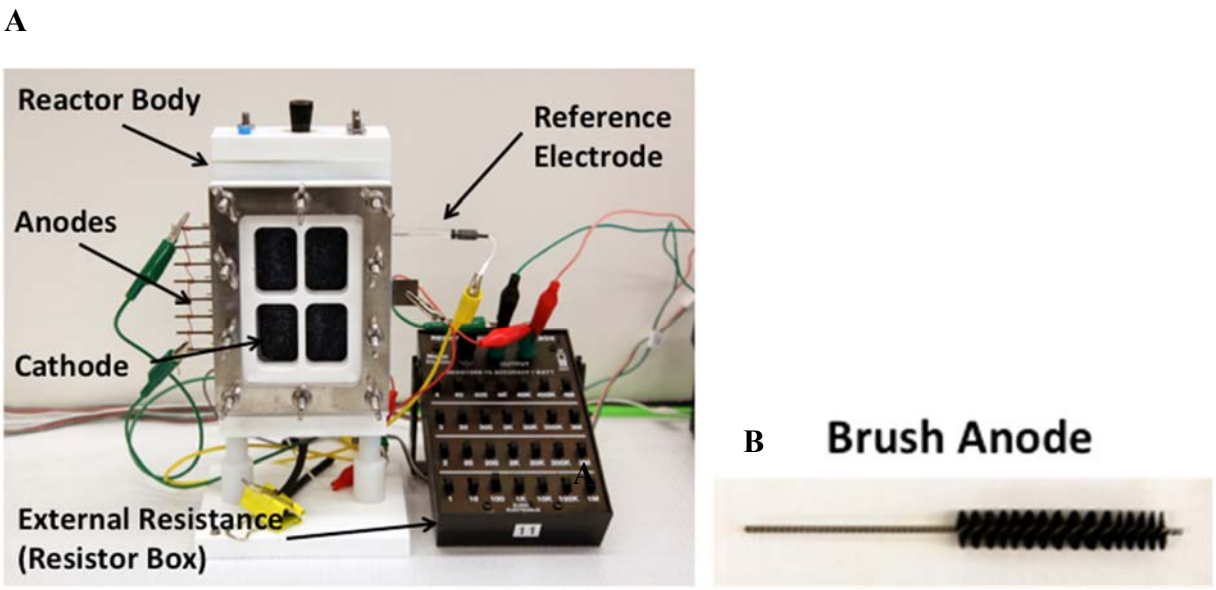

Fig. S1 (A) MFC reactor body (B) graphite fiber brush anode

Fig. S2 Photograph of the anodes, taken after operation of the MFC for more than one year.

Conductivity Experiments Using Pt-NS Cathodes

Wastewater was amended with 3.35 g/L of sodium chloride to increase solution conductivity to 6.2 mS/cm, similar to that of a 50 mM phosphate buffer solution (PBS) used in many MFC tests, in order to try to avoid power overshoot. While the extent of power overshoot was reduced (Fig. S3) compared to that obtained prior to the addition of the sodium chloride (Fig. 1), overshoot was still observed. Other tests conditions for Fig. S3 are the same as those indicated for Fig. 1.

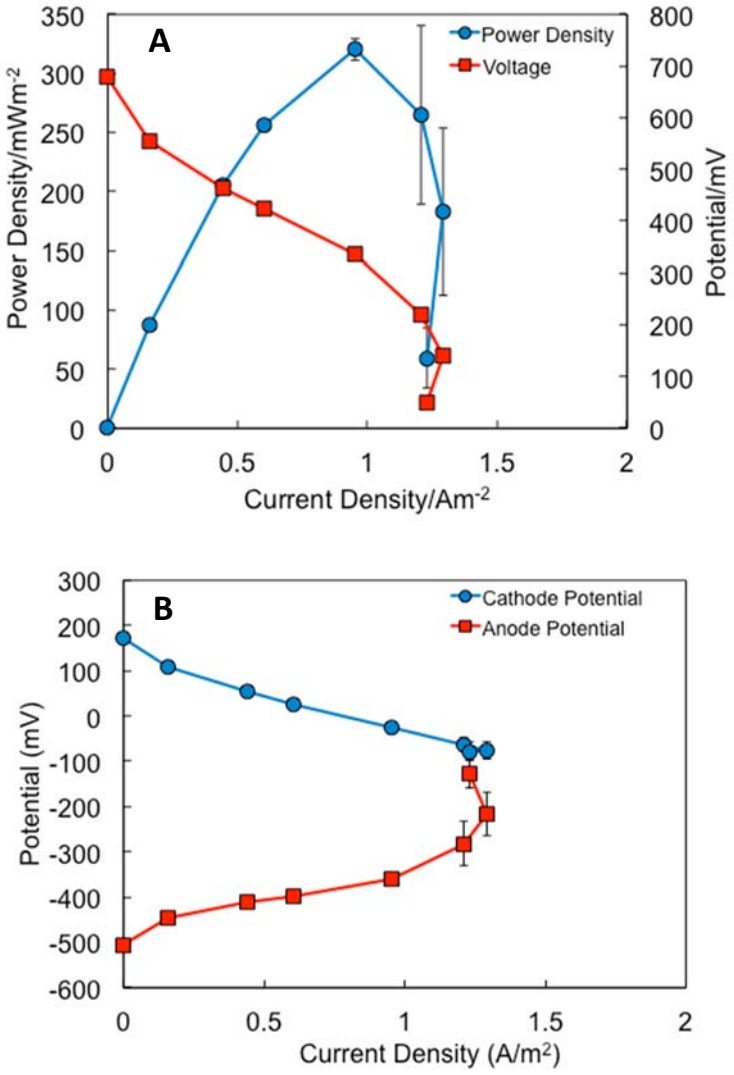

Fig. S3. (A) Power density and cell voltage after adding sodium chloride to increase solution conductivity (B) Cathode and anode potentials after adding sodium chloride to increase solution conductivity

Performance of reactors R1 and R2 over time (Pt-NS Cathodes)

The performance of the two reactors (R1 and R2) can be seen over time in Fig. S4A in terms of voltages and electrode potentials. As seen in Fig. S4B (selected times from data shown in Fig. 4A, from day 35 and later, R1 was a producing a voltage ~100 to 300 mV less than R2, and the voltage was more erratic than that of R2.

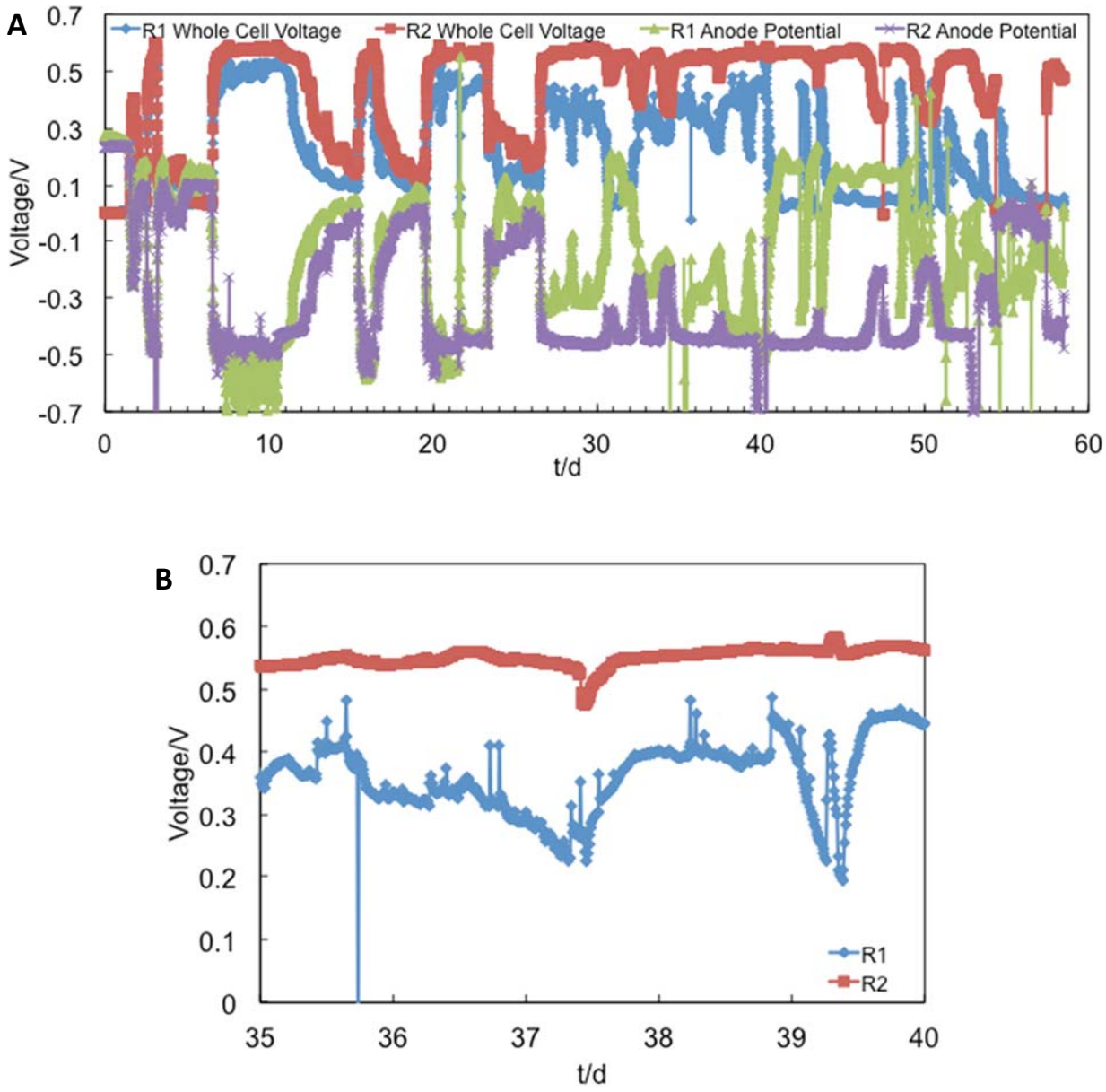

Fig. S4. (A) Whole cell voltages and anode potentials for the two reactors, R1 and R2, containing Pt-NS cathodes. The reactors were operated in fed batch mode until 25, and then switched to continuous flow mode (HRT=8 h). (B) Voltage data from R1 and R2 from days 35 to 40 to better show the differences in reactor performance.

$HBOD_3$ Data

The biochemical oxygen demand was compared to the chemical oxygen demand using the $HBOD_3$ test. The summarized data are shown in Table S1, with the individual results given in Table S2 below.

Table S1 COD:$HBOD_3$ ratios for influent and effluent wastewater

Sample	COD:$HBOD_3$ Ratios		Average COD:$HBOD_3$ Ratio
Wastewater (Influent)	2.30	2.04	2.2 ± 0.2
Pt-NS (Effluent)	1.55	2.13	1.8 ± 0.4
AC-CS (Effluent)	1.86	1.54	1.7 ± 0.2

Table S2 Comparison of COD measurements to $HBOD_3$ measurements using selected samples

Wastewater	COD (mg/L)	$HBOD_3$ (mg/L)	$HBOD_3$/COD (%)
Influent	408	199	49
Influent	399	173	43
Influent	330	206	62
Effluent- Pt-NC cathode, R1	52	34	64
Effluent- Pt-NC cathode, R2	37	17	47
Effluent- AC-CS cathode, R1	142	76	54
Effluent- AC-CS cathode, R2	129	83	65