

Supporting Information

Decolorization of Azo Dyes in Bioelectrochemical Systems

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TABLE S1. Experimental Setup for Cathode^a

series	purpose	conditions
1	effect of influent AO7 concentration	influent AO7: 0.19, 0.40, 0.59, 0.70 mM HRT: 1.44 h external resistance: 8.5 Ω pH: 7.0
2	effect of external resistance	external resistance: 3.2, 8.5, 20, 50, 100 Ω influent AO7: 0.19 mM HRT: 1.44 h pH: 7.0
3	effect of cathodic HRT	HRT: 3.79, 2.17, 1.44, 0.48, 0.31 h influent AO7: 0.19 mM external resistance: 8.5 Ω pH: 7.0
4	effect of cathodic pH	influent pH of cathode: 5.5, 7.0, 9.4 influent AO7: 0.19 mM HRT: 1.44 h external resistance: 8.5 Ω
5	effect of cathode electrode potential	cathodic potential: -350, -400, -450, -500, -550 mV vs SHE influent AO7: 0.89 mM HRT: 1.44 h pH: 7.0

^aThe anode operation conditions were the same as those used during BES startup.

TABLE S2. Comparison of AO7 Decolorization with Anaerobic Biological Methods

reactor	conditions			decolorization rate	reductant usage ratio (mol COD mol ⁻¹ AO7)	reference
	HRT (h)	substrate	T (°C)			
BES ^a	1.44	acetate	25	1.32±0.01 ^e	2.5±0.2	this study
BES ^b	1.44	acetate	25	6.58±0.03 ^e	3.5±0.2	this study
UASB ^c	6	acetate:propionate: butyrate = 1:1:1	30	1.10±0.03 ^f	144	(1)
UASB	9.6	glucose	37	1.416 ^f	196	(2)
RDBR ^d	1.6	acetate	28	2.016 ^f	54	(3)

^aexternal resistance 3.2 Ω. ^bcathodic potential controlled at -400 mV vs SHE (power consumption 0.012±0.001 kWh mol⁻¹ AO7).
^cupflow anaerobic sludge blanket. ^drotating drum bioreactor. ^eunit is mol m⁻³ total working BES volume d⁻¹. ^funit is mol m⁻³ working reactor volume d⁻¹.

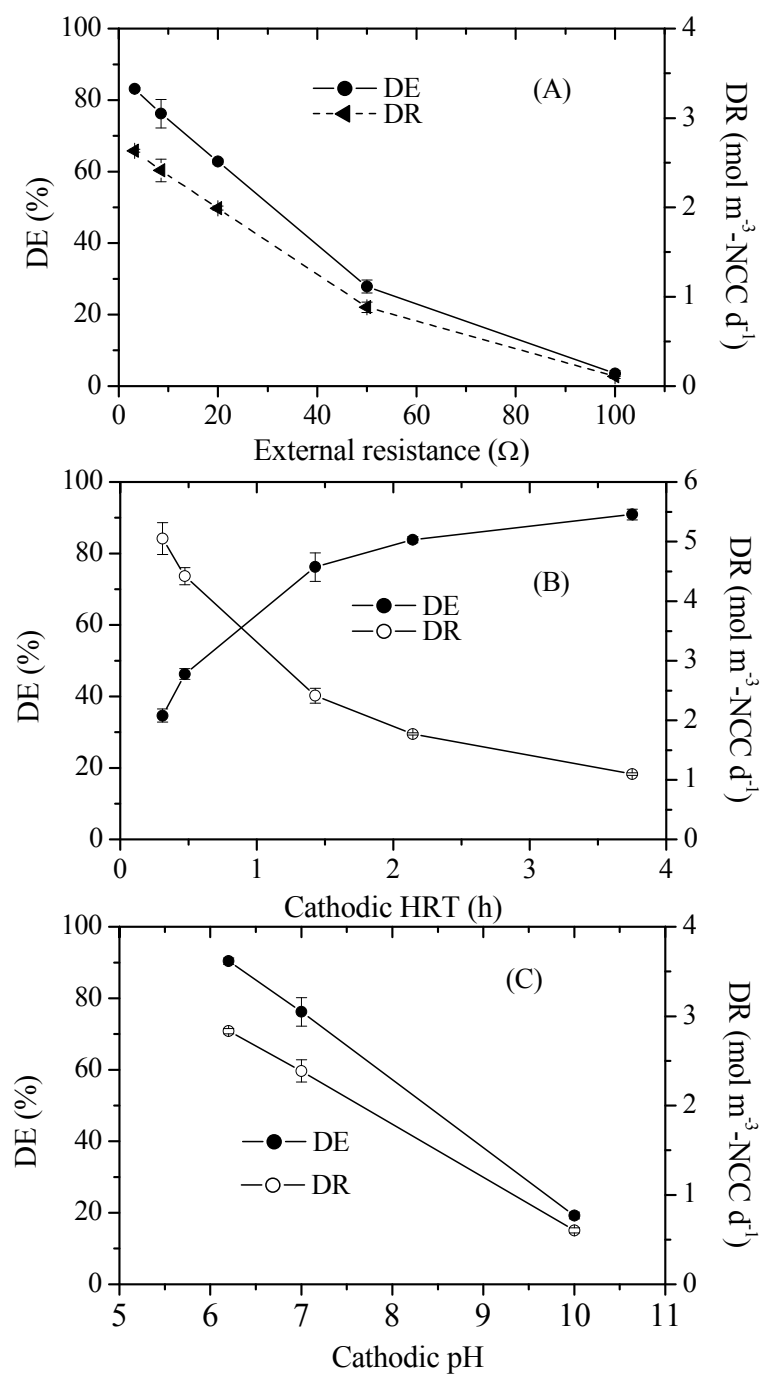


FIGURE S1. Effect of (A) external resistance, (B) cathodic HRT, and (C) cathodic pH on AO7 decolorization efficiency (DE) and rate (DR) in BES (A: influent AO7 0.19 mM, HRT 1.44 h, pH 7.0; B: influent AO7 0.19 mM, external resistance 8.5 Ω , pH 7.0; C: influent AO7 0.19 mM, external resistance 8.5 Ω , HRT 1.44 h).

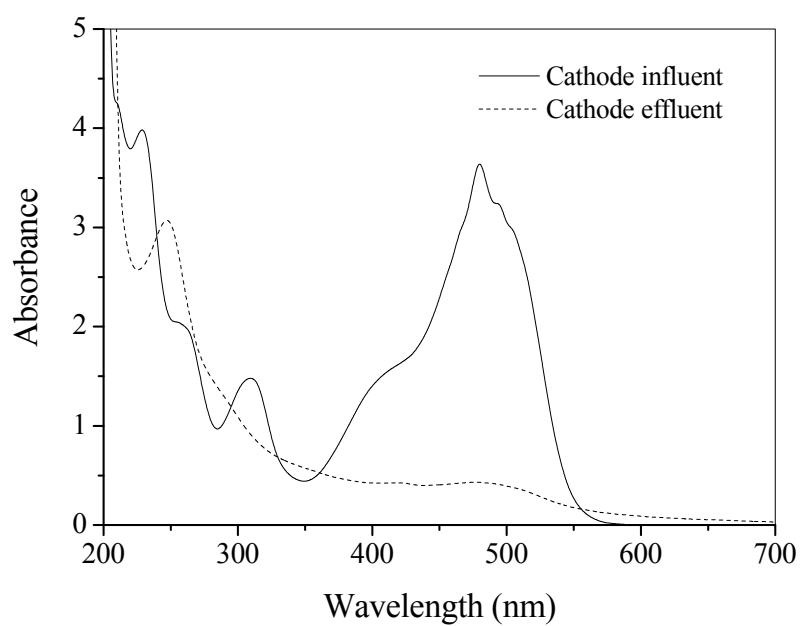


FIGURE S2. Evolution of UV-vis spectra for AO7 decolorization (AO7 concentration 0.19 mM, external resistance 8.5 Ω , HRT 1.44 h, pH 7.0).

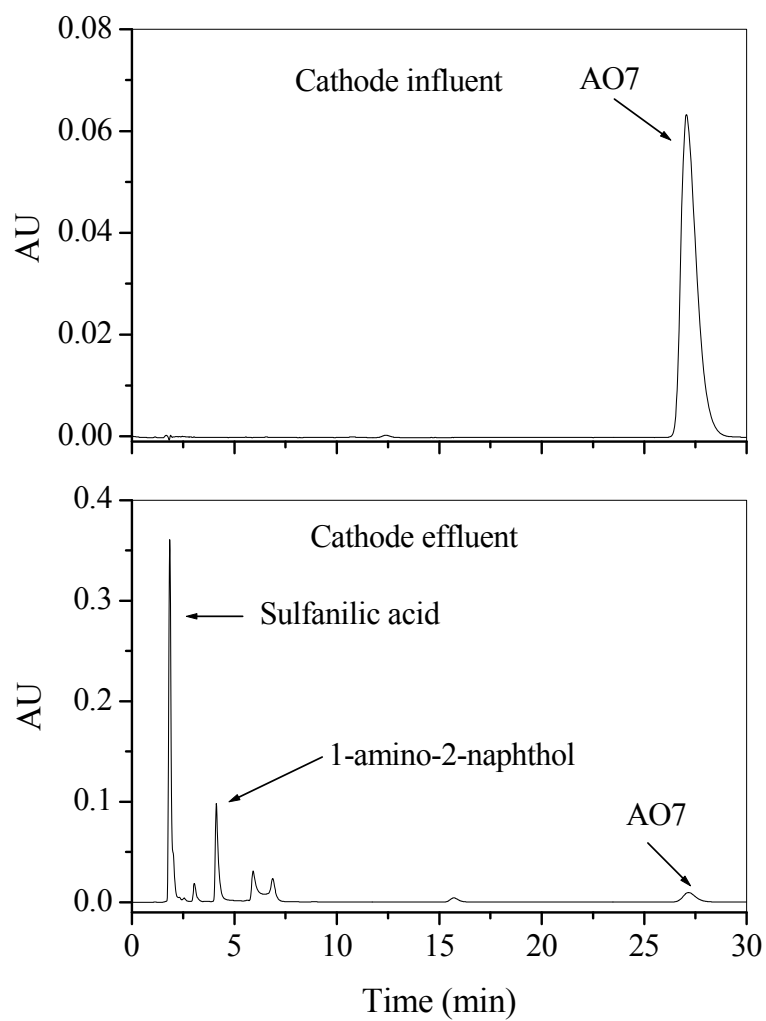


FIGURE S3. HPLC chromatogram of influent and effluent samples of the cathode in BESs (AO7 concentration 0.19 mM, external resistance 8.5 Ω , HRT 1.44 h, pH).

Literature Cited

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