

Supporting information

Substantial Humic Acid Adsorption to Activated Carbon Air Cathodes Produces a Small Reduction in Catalytic Activity

Wulin Yang^a, Valerie J. Watson^a, Bruce E. Logan^{*a}

^aDepartment of Civil and Environmental Engineering, The Pennsylvania State University,
University Park, Pennsylvania 16802, United States

*Corresponding Author. Telephone: +1 814 863 7908. Fax: +1 814 863 7304. E-mail:
blogan@psu.edu.

number of pages: 5

number of figures: 4

number of tables: 2

Table S1. HA concentrations before and after AC adsorption

Sample	Before (mg-C L ⁻¹)	After (mg-C L ⁻¹)	Adsorption mass (mg-C)
100 mg L ⁻¹	33 ± 2	20 ± 1	1.4 ± 0.1
1000 mg L ⁻¹	330 ± 20	190 ± 1	14 ± 2

Table S2. HA concentration and loading of back wash effluent

Effluent volume (mL)	Concentration (mg-C L ⁻¹)	Mass (mg-C)
30	12 ± 1	0.36 ± 0.04

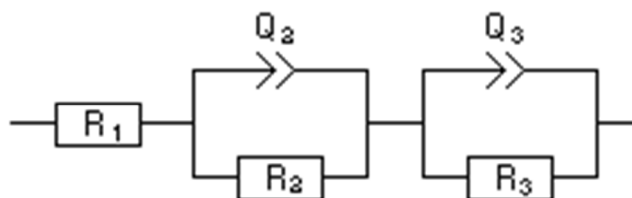


Figure S1. Equivalent circuit for EIS spectra (R_1 : solution resistance; R_2 : charge transfer resistance; R_3 : diffusion resistance; Q_2 , Q_3 : constant phase elements).

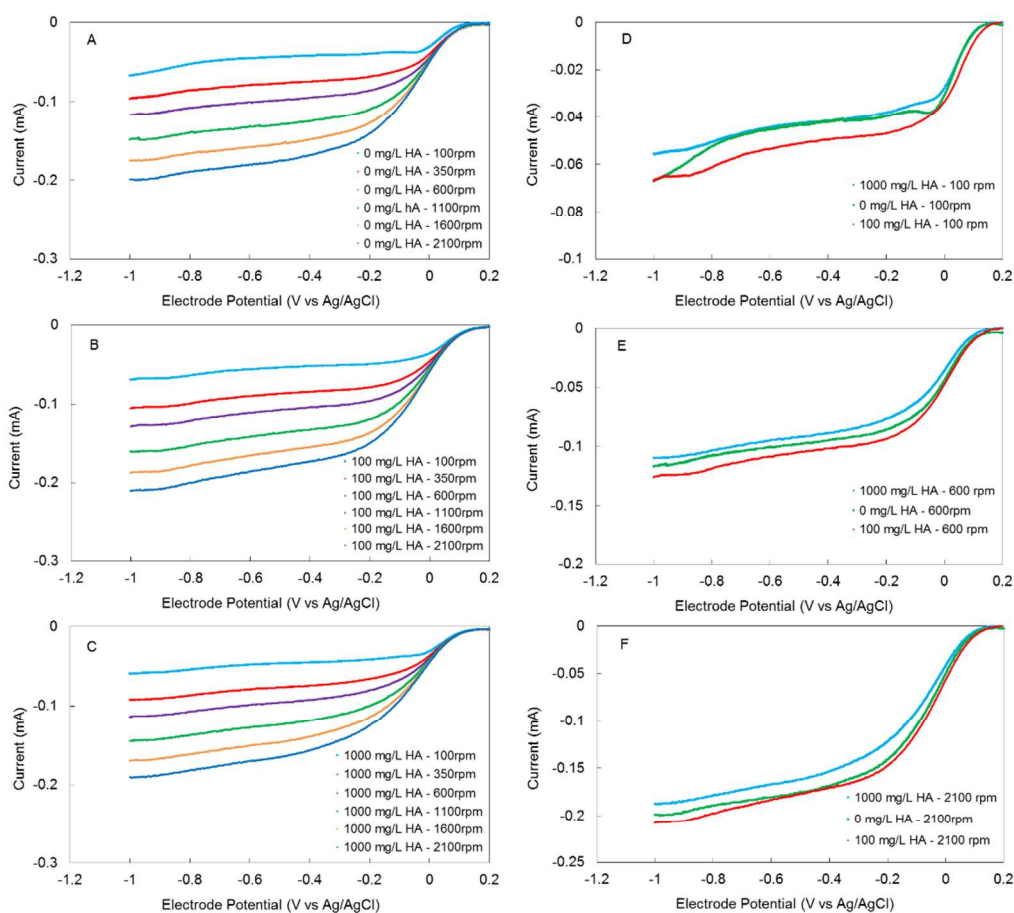


Figure S2. (A-C) Current-potential curves at different rotation rates for AC adsorbed with 0, 100 and 1000 mg L⁻¹ HA solutions. (D-E) Current-potential curves at 100, 600 and 2100 rpm for AC adsorbed with 0, 100 and 1000 mg L⁻¹ HA solutions.

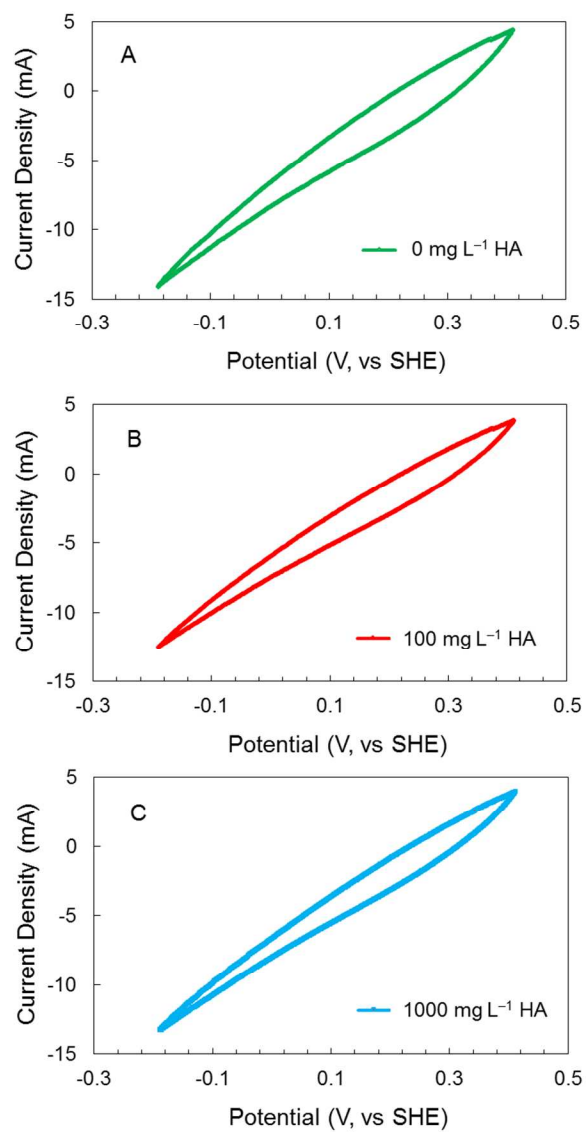


Figure S3. (A-C) Cyclic voltammetry curves of activated carbon cathode in 0, 100 and 1000 mg L⁻¹ HA solution buffered with 50 mM PBS.

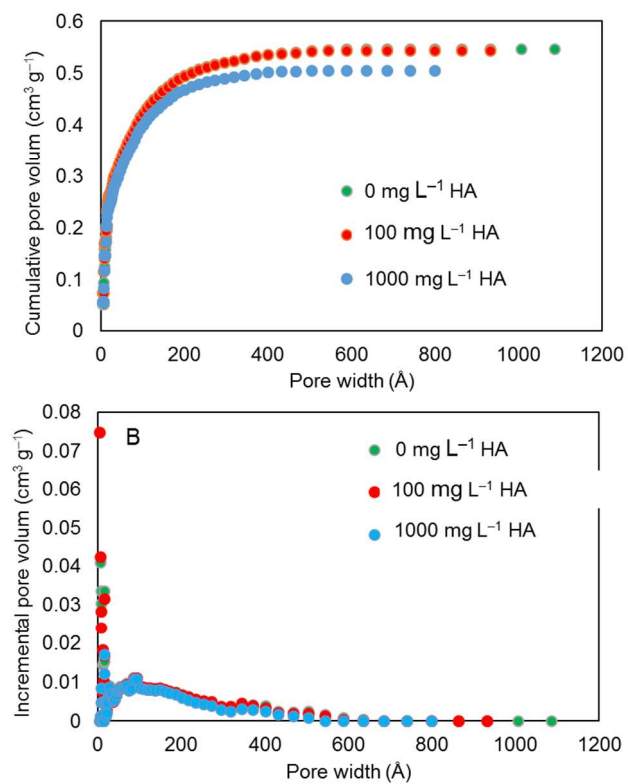


Figure S4. (A) Cumulative pore volume (B) pore size distributions of ACs treated with 0, 100, 1000 mg/L HA solutions.