Supporting Information

Cellulose Derived Graphenic Fibers for Capacitive Desalination of Brackish Water

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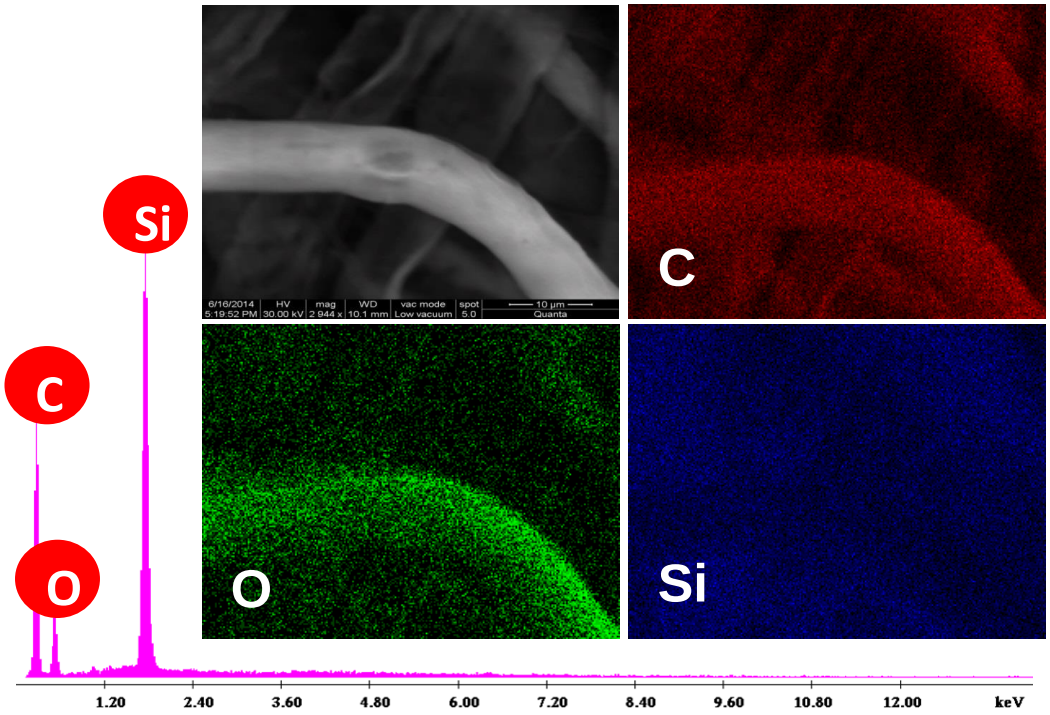

Figure S1. EDS spectrum of the layer-by-layer stacked carbon-graphite electrode before SiO_2 etching. Inset: Its corresponding SEM image and elemental mapping images.

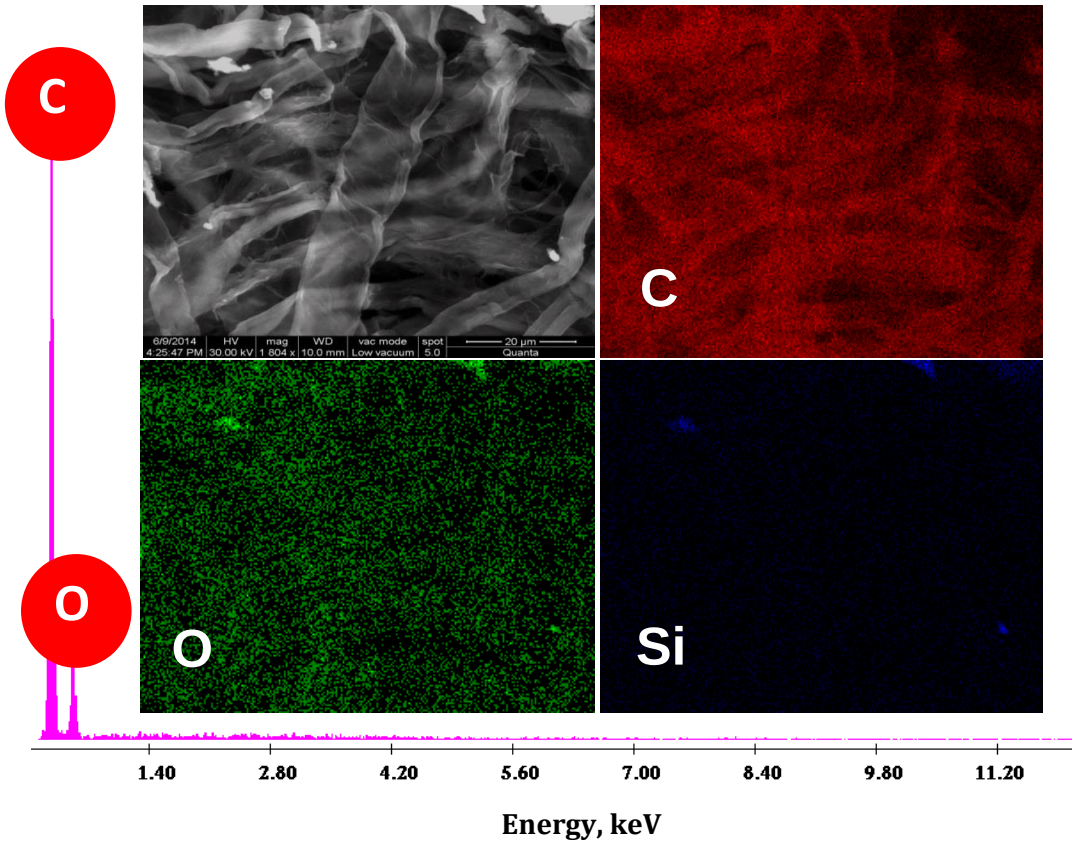

Figure S2. EDS spectrum of the layer-by-layer stacked carbon-graphite electrode after etching SiO_2. Inset: SEM and Elemental mapping images.

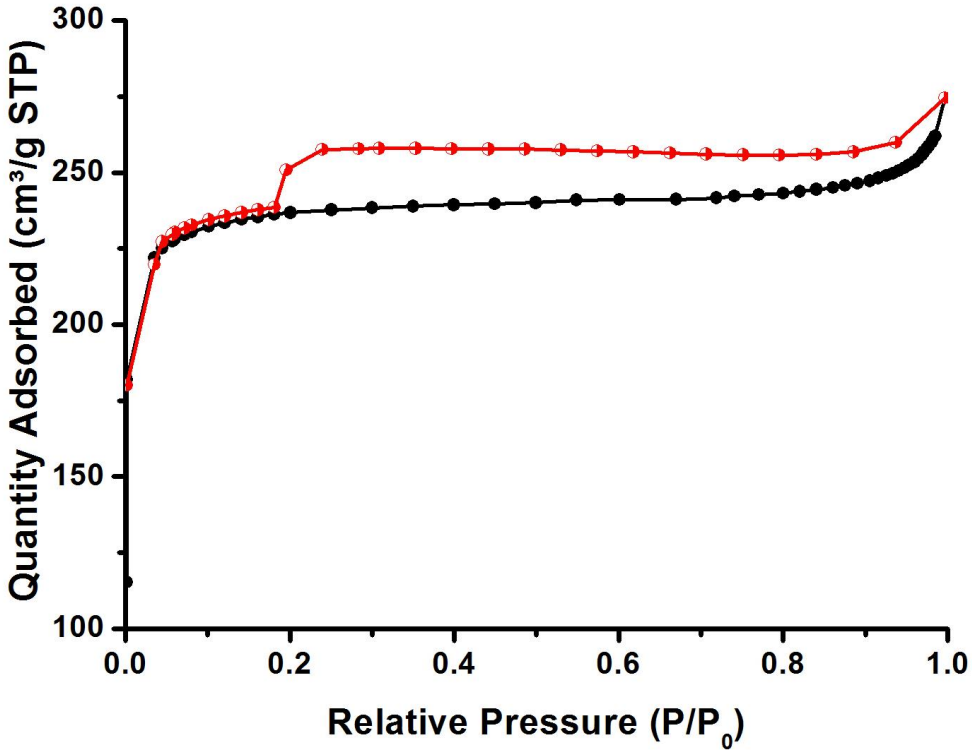

Figure S3. N_2 adsorption–desorption isotherms of graphite-reinforced carbon fiber electrode.

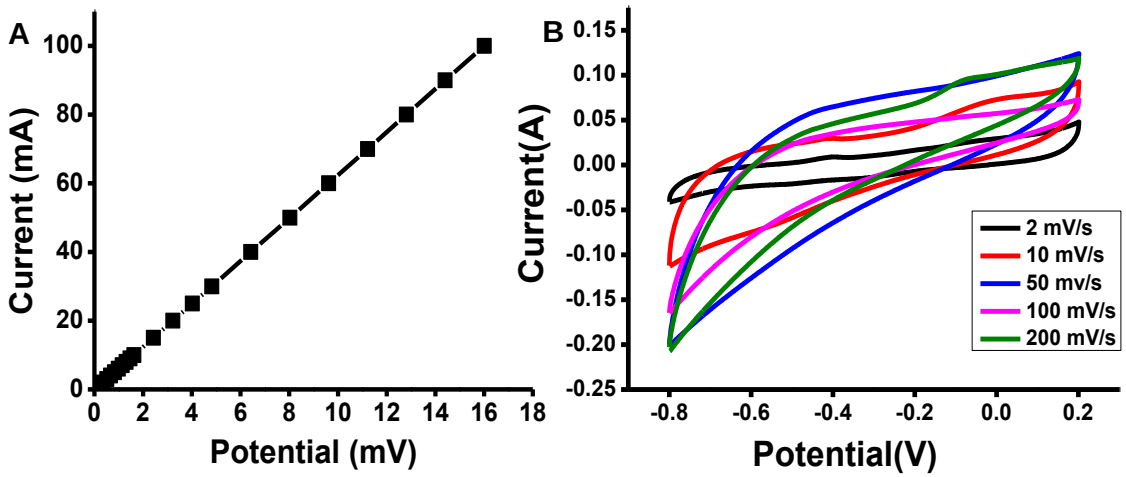

Figure S4:A) I-V curve and B) CV curves of the GrC electrode at varying scan rates

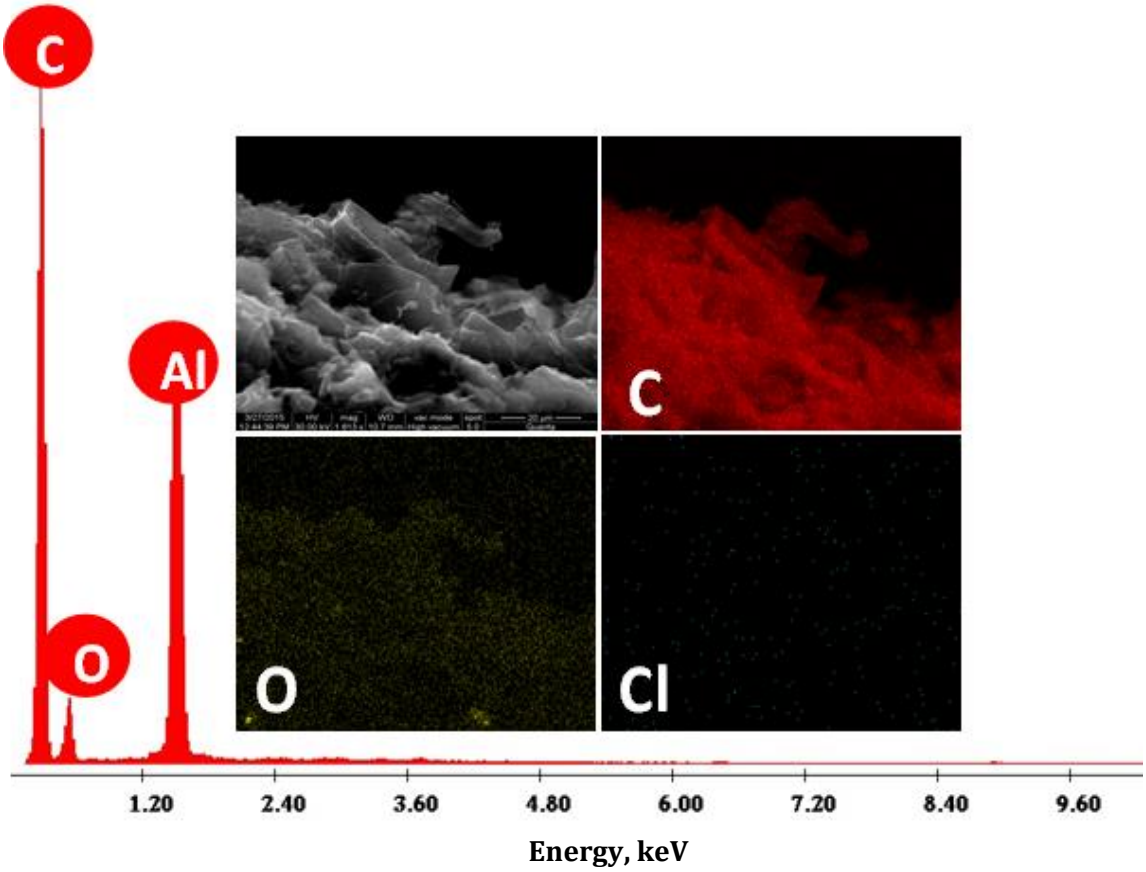

Figure S5. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in NaCl solution. EDS spectrum and their elemental mapping images of the regenerated positive terminal carbon-graphite electrode (after first cycle). *Note: Aluminum comes from the SEM sample stubs.*

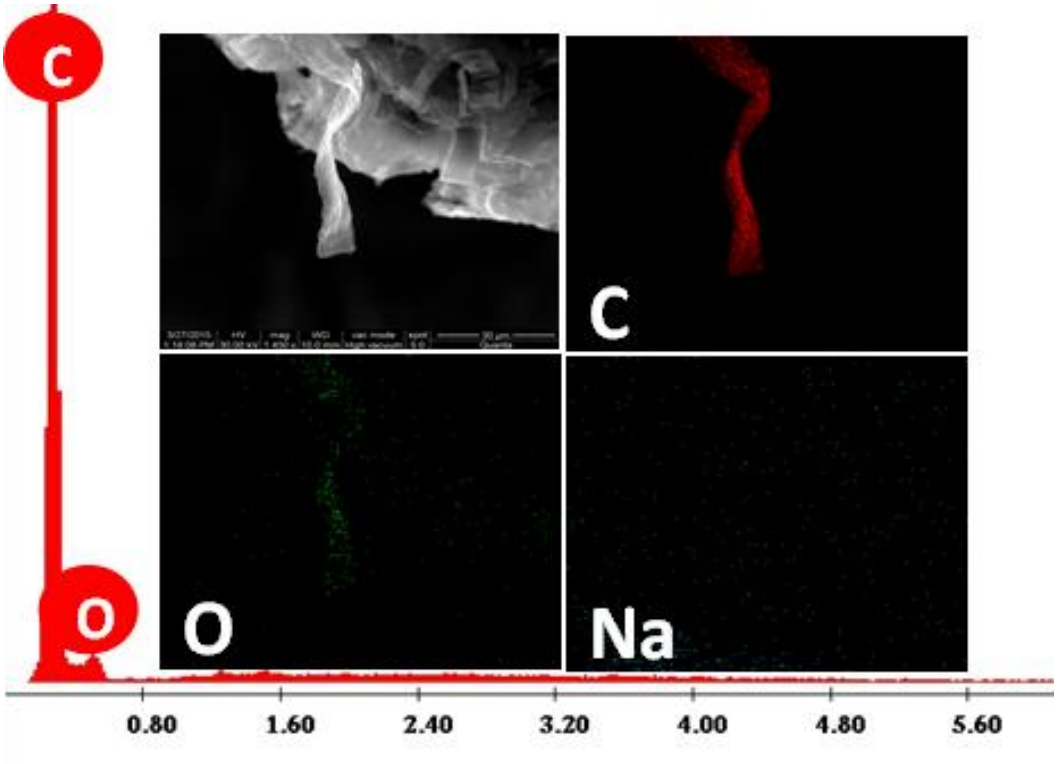

Figure S6. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in NaCl solution. EDS spectrum and their elemental mapping images of the regenerated negative terminal carbon-graphite electrode (after first cycle).

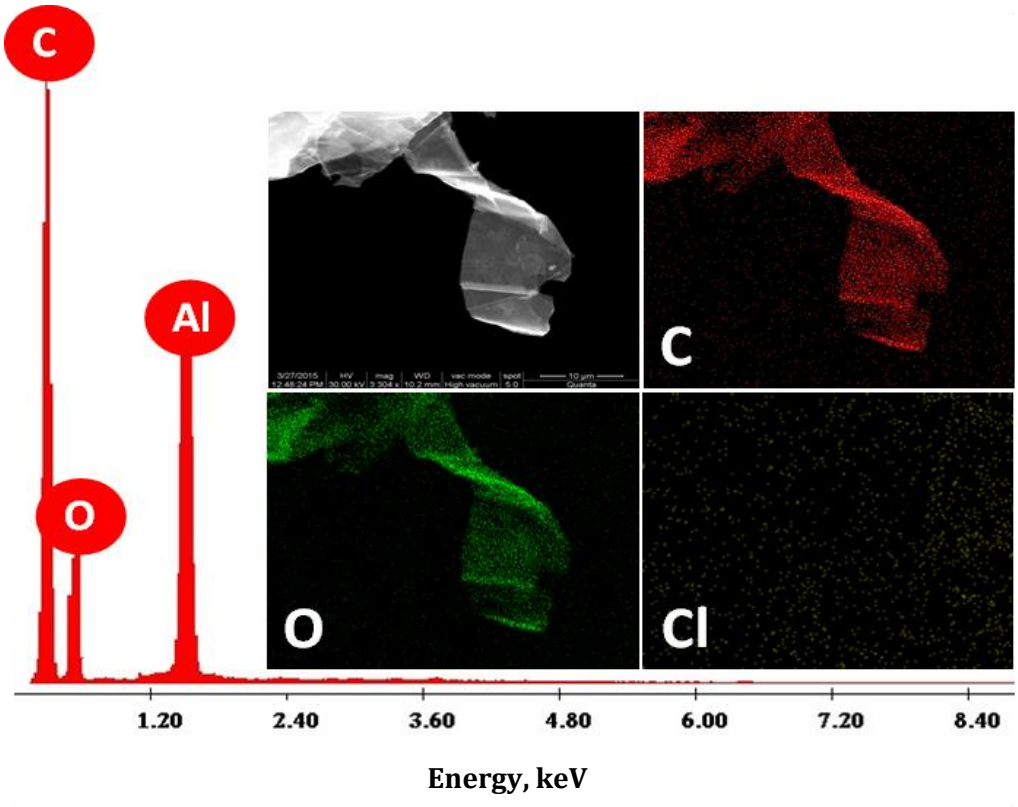

Figure S7. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in NaCl solution. EDS spectrum and their elemental mapping images of the regenerated positive terminal carbon-graphite electrode (after ten consecutive cycle). *Note: Aluminum comes from the SEM sample stubs.*

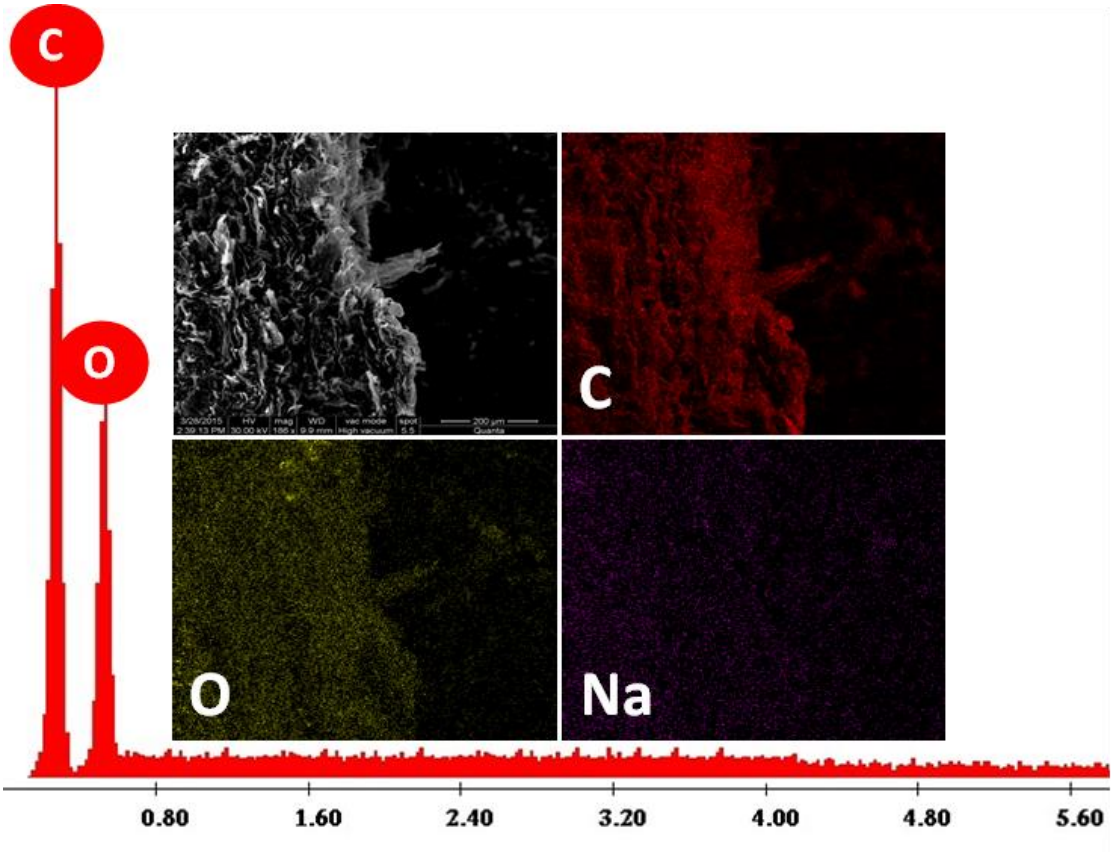

Figure S8. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in NaCl solution. EDS spectrum and their elemental mapping images of the regenerated negative terminal carbon-graphite electrode (after ten consecutive cycle).

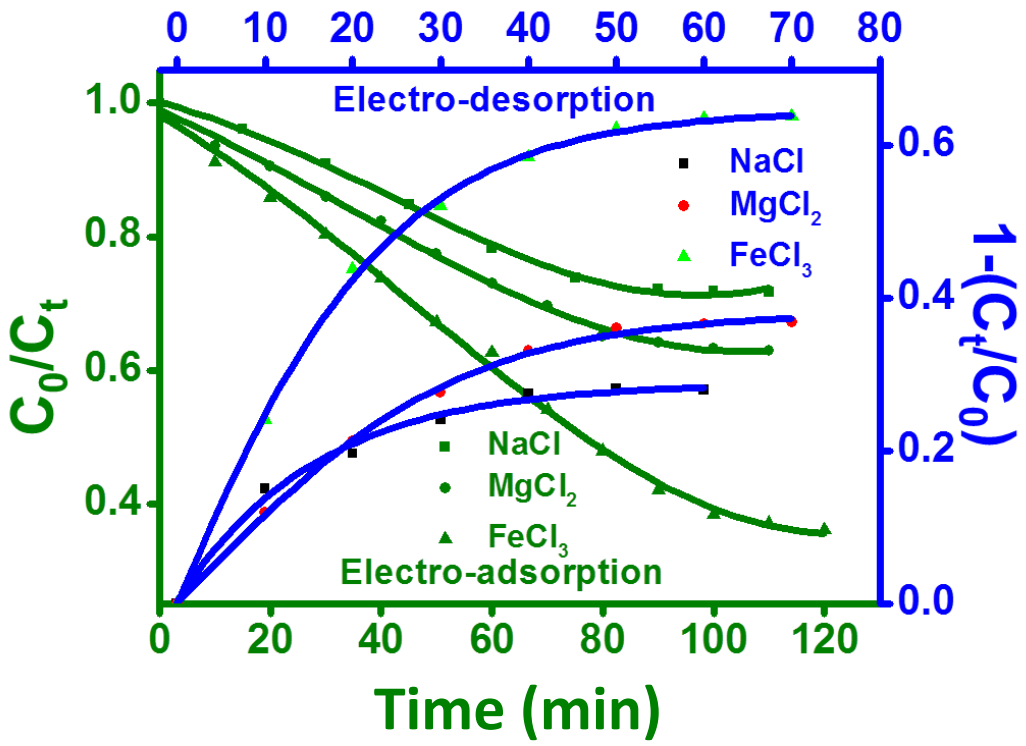

Figure S9. Plot of CDI results of electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in different charged species ie., Na^{+}, Mg^{2+} and Fe^{3+}.

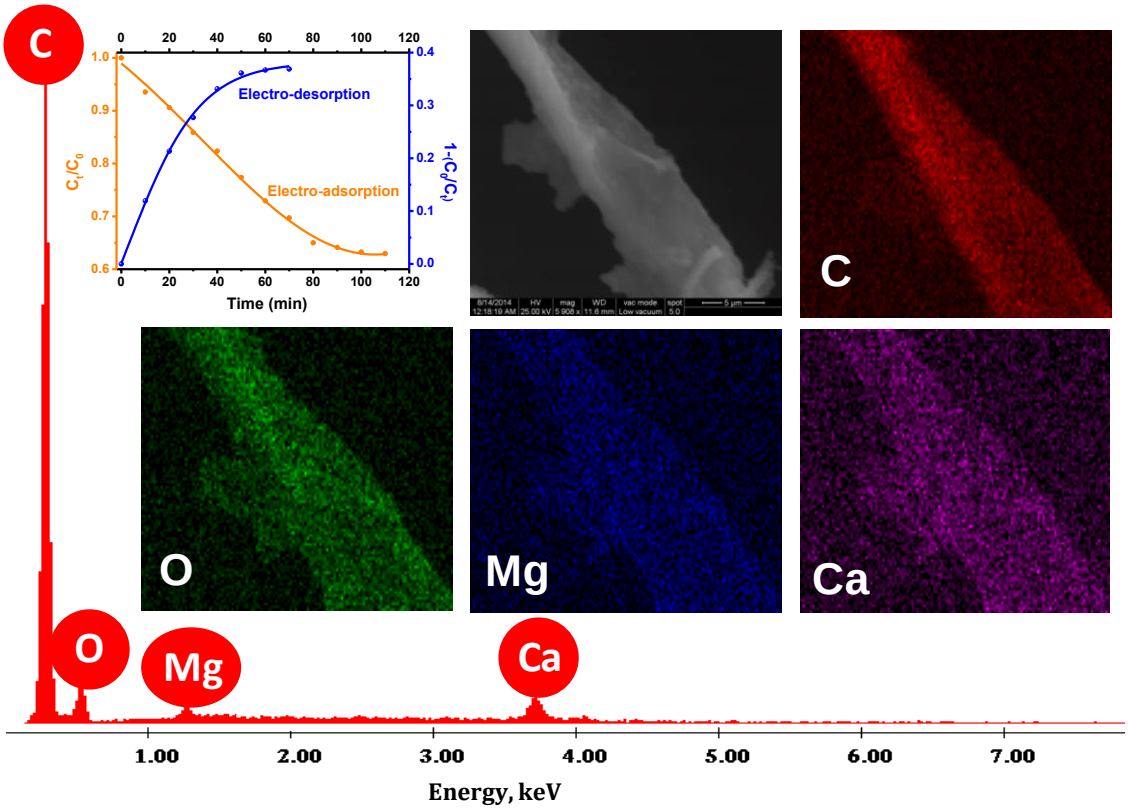

Figure S10. Electro-adsorption and electro-desorption performance of the graphite-reinforced carbon fiber electrode in $MgCl_2$ solution. EDS spectrum and their elemental mapping images of the negative terminal after electro-adsorption of the carbon-graphite electrode. *Note: Calcium is from the water used.*

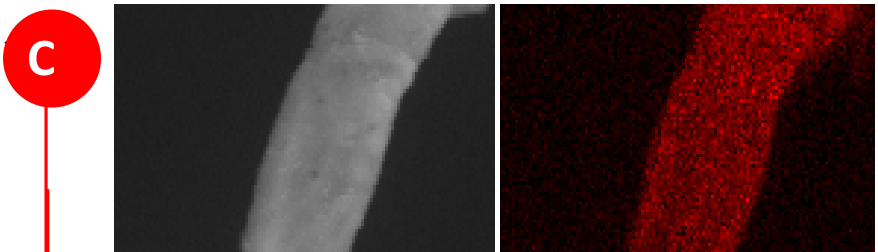

Figure S11. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in $MgCl_2$ solution. EDS spectrum and their elemental mapping images of the positive terminal after electro-adsorption of the carbon-graphite electrode.

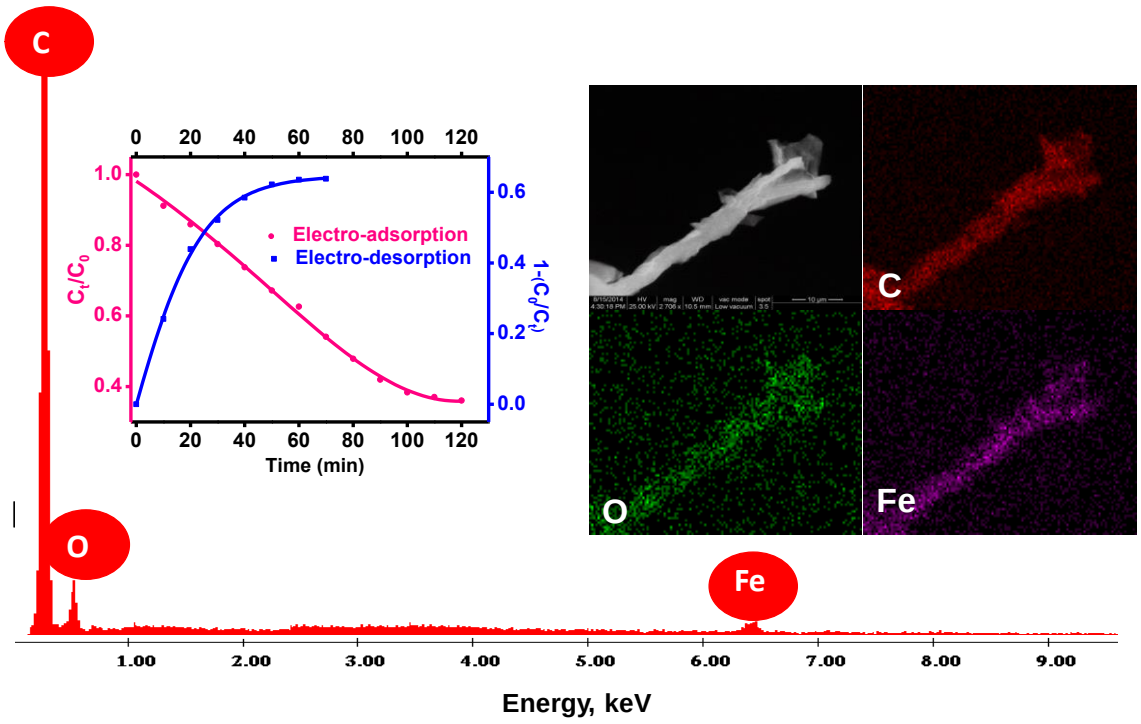

Figure S12. Electro-adsorption and desorption performance of the graphite-reinforced carbon fiber electrode in $FeCl_3$ solution. EDS spectrum and their elemental mapping images of the negative terminal after electro-adsorption on the carbon-graphite electrode.

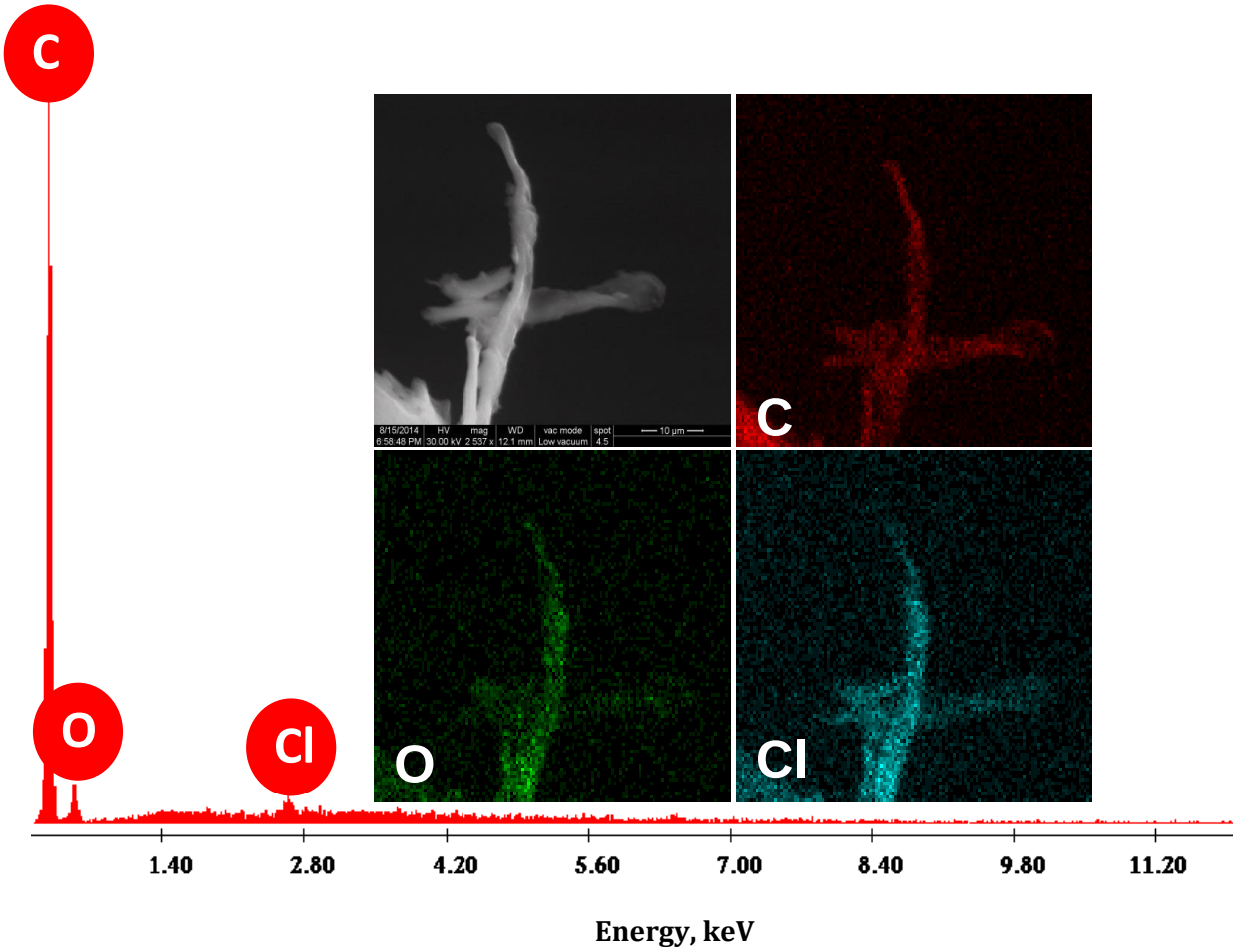

Figure S13. Electro-adsorption and desorption performance of graphite reinforced carbon fiber electrode in $FeCl_3$ solution. EDS spectrum and their elemental mapping images of the positive terminal after electro-adsorption on the carbon-graphite electrode.

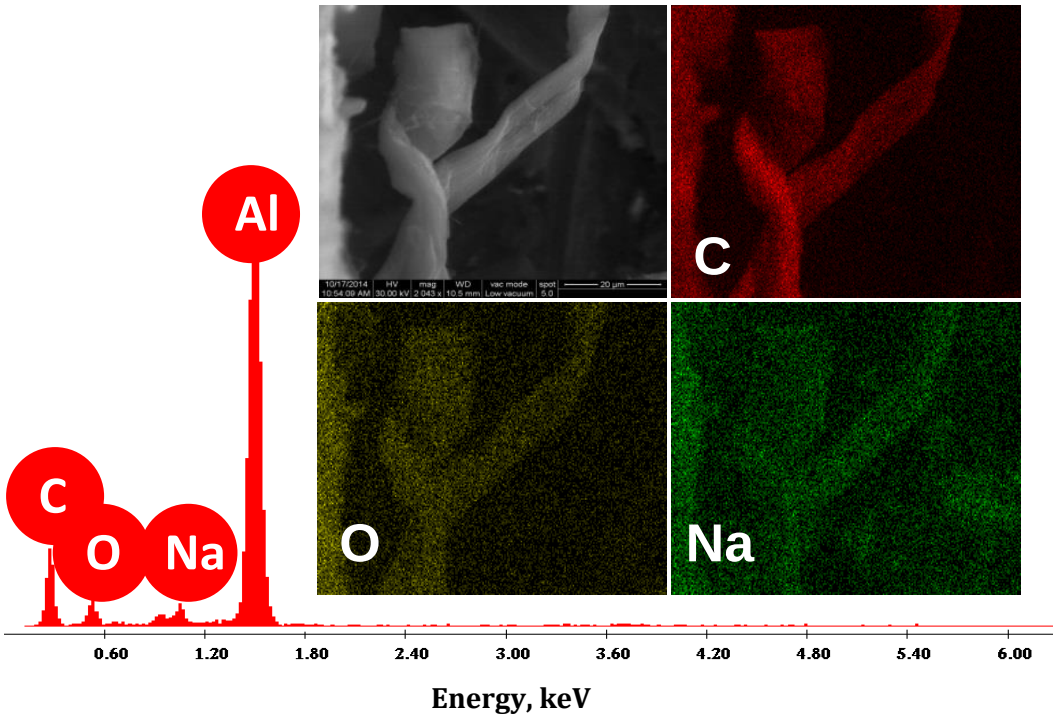

Figure S14. CDI performance of graphite reinforced carbon fiber electrode in the mixed negative ions (Cl^-, F^-, NO_3^-, SO_4^{2-}) system. EDS spectrum and their elemental mapping images of the negative terminal after electro-adsorption on the porous carbon-graphite electrode. *Note: Aluminum comes from the SEM sample stubs.*

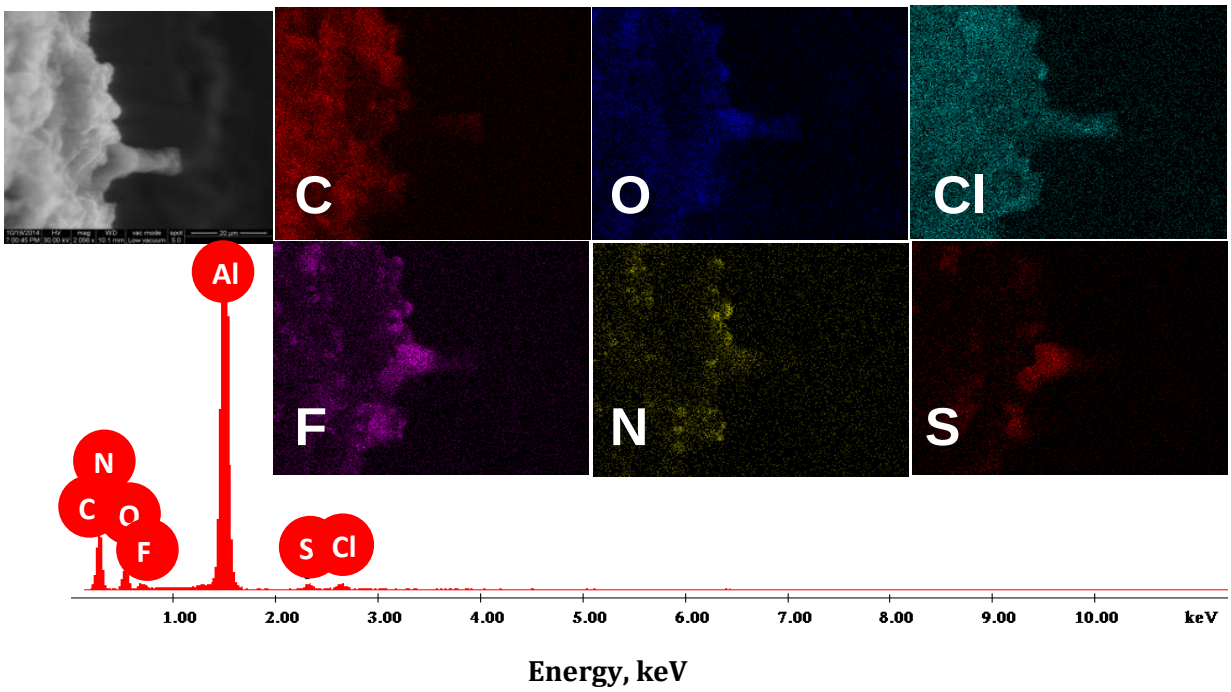

Figure S15. CDI performance of graphite reinforced carbon fiber electrode in the mixed negative ions (Cl^-, F^-, NO_3^-, SO_4^{2-}) system. EDS spectrum and their elemental mapping images of the positive terminal after electro-adsorption on the porous carbon-graphite electrode which shows the presence of O, Cl, F, N and S. *Note: Aluminum comes from the SEM sample stubs.*

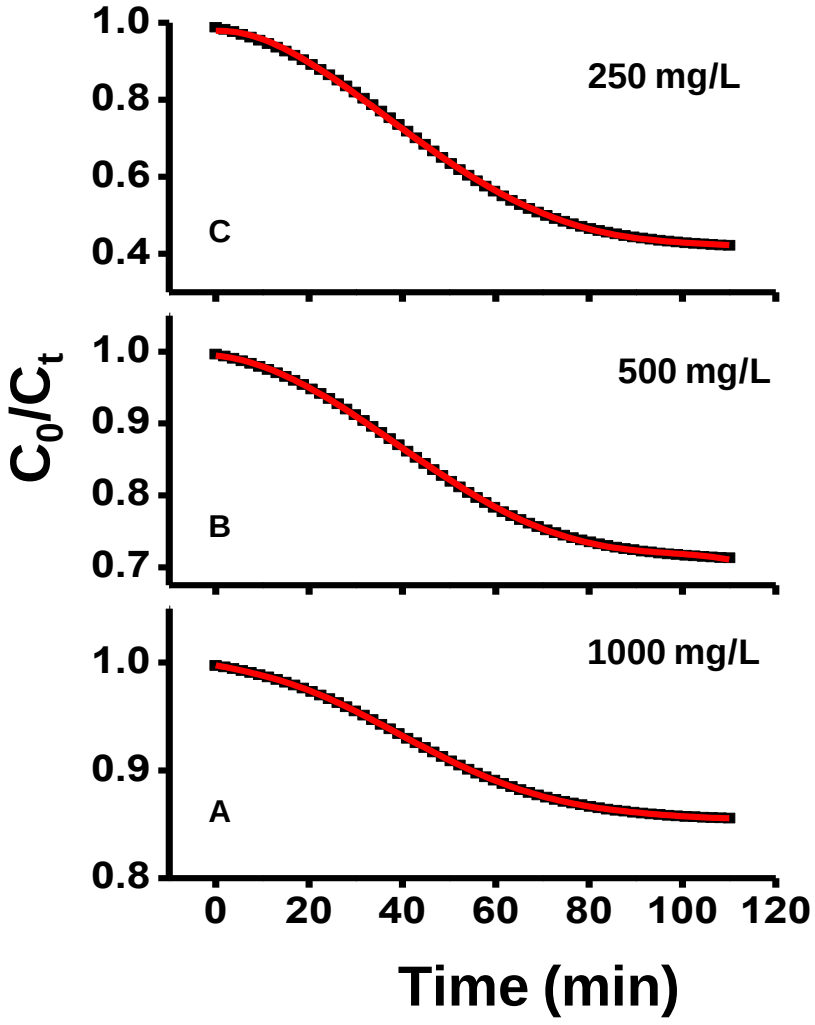

Figure S16. CDI performance of the GrC electrode at different NaCl concentration A) 1000, B) 500 and C) 250 mg/L. All other parameters are kept constant. This measurement was performed as it is known that the salt concentrations used to measure the electrosorption performance influence the observed capacities.