Supplementary Information (SI) for Sustainable Energy & Fuels.

'Evaporating Potential'? Definitely not!

Why charges must be present for a hydrovoltaic device to work.

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Contents:

1. FG24 device setup

This section demonstrates FG24 devices complete with painted CNT electrodes in both CE and DE configurations.

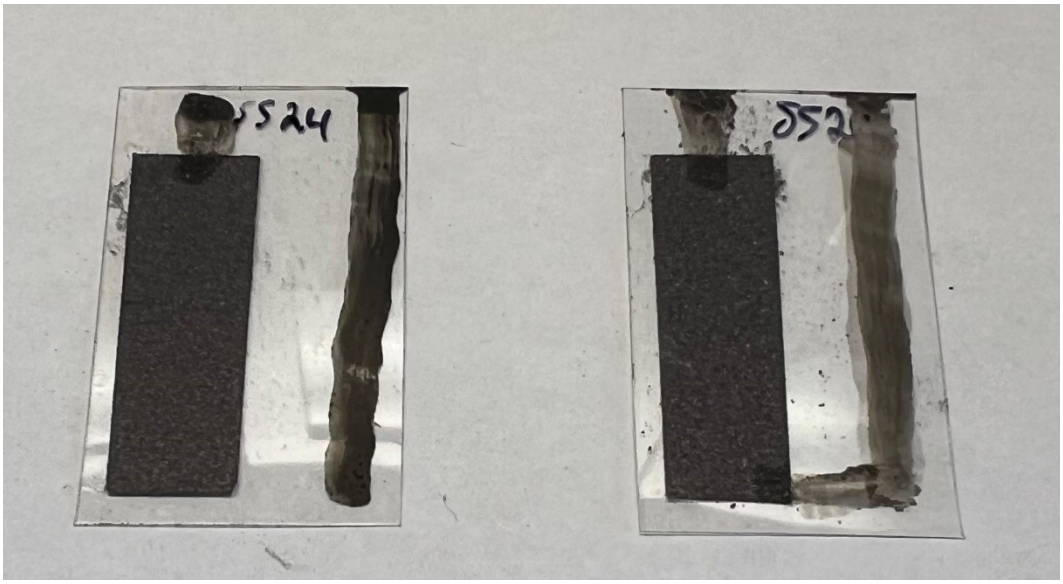

Figure S1. An image demonstrating a disconnected electrode (DE, left) FG24 device with CNT paint electrodes and a connected electrode (CE, right) FG24 device with CNT paint electrodes.

2. Performance of DE and CE FG24 devices in various solvents

This section provides the OCP and LSV plots associated with data presented in the bar graphs of **Figure 3**.

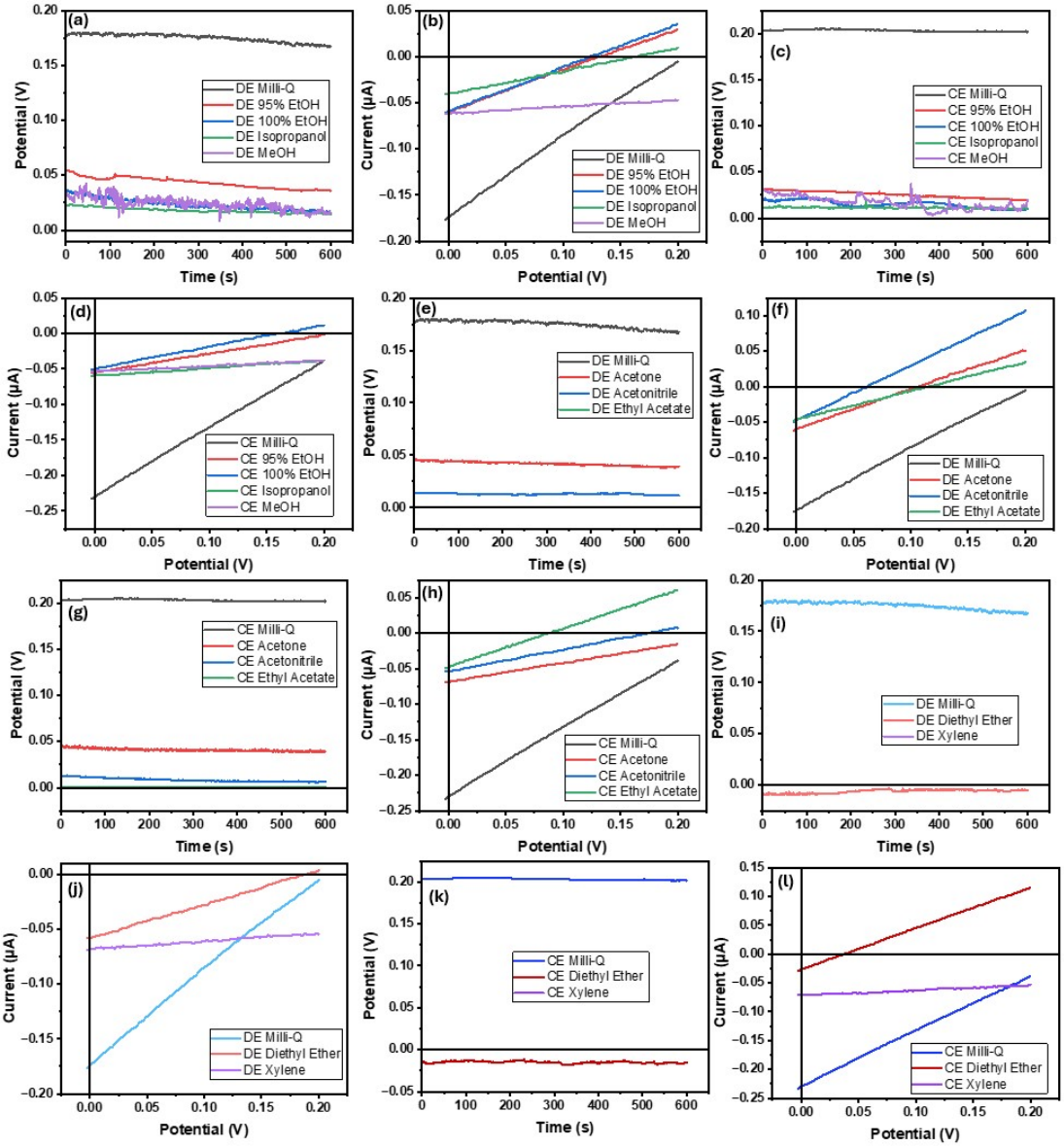

Figure S2. (a) The open-circuit potentials (OCP's) associated with DE FG24 devices measured in polar protic solvents, **(b)** the linear sweep voltammetry (LSV's) plots associated with DE FG24 devices measured in polar protic solvents, **(c)** the OCP's associated with CE FG24 devices measured in polar protic solvents, **(d)** the LSV's associated with CE FG24 devices measured in polar protic solvents, **(e)** the OCP's associated with DE FG24 devices measured in polar aprotic solvents, **(f)** the LSV's associated with DE FG24 devices measured in polar aprotic solvents, **(g)** the OCP's associated with CE FG24 devices measured in polar aprotic solvents, **(h)** the LSV's associated with CE FG24 devices measured in polar aprotic solvents, **(i)** the OCP's associated with DE FG24 devices measured in non-polar solvents, **(j)** the LSV's associated with DE FG24 devices measured in non-polar solvents, **(k)** the OCP's of CE FG24 devices measured in non-polar solvents, and **(l)** the LSV's of CE FG24 devices measured in non-polar solvents.

3. Performance of the same DE and CE devices in xylene and water

This section demonstrates that the same DE and CE devices which perform poorly in the non-polar solvent xylene exhibit power generation when returned to Milli-Q water.

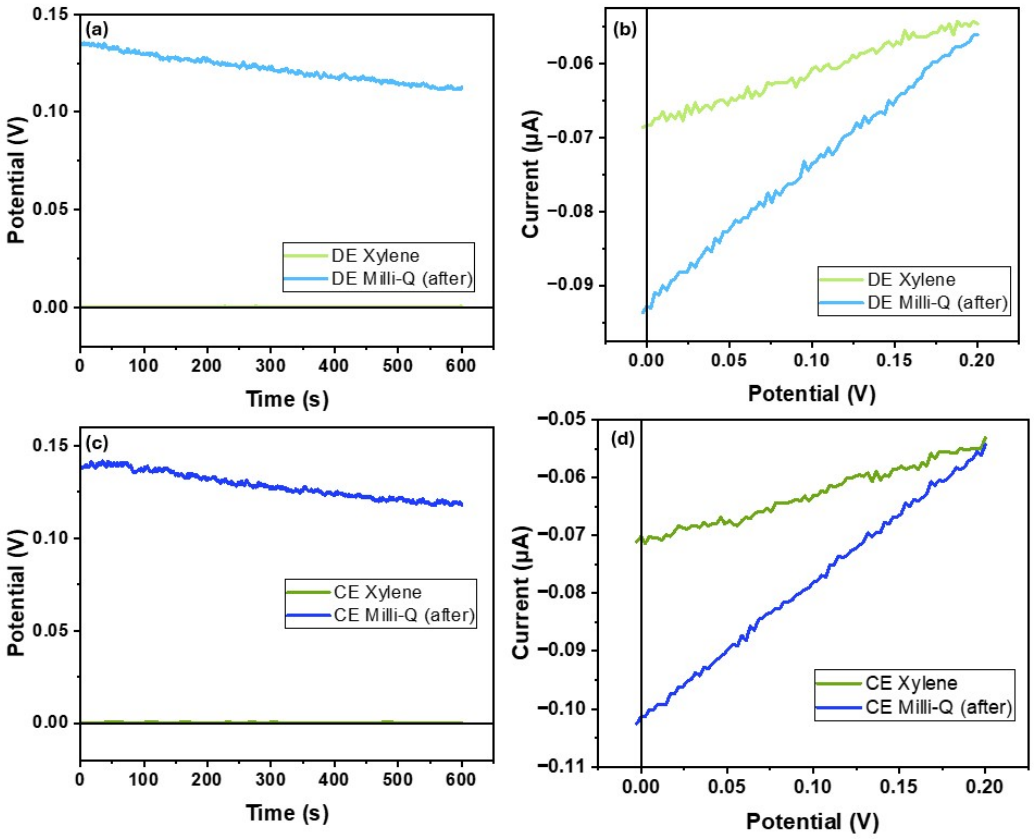

Figure S3. (a) The V_{OC}'s generated by the same DE FG24 device when sequentially measured in xylene and Milli-Q water, **(b)** the LSV curves associated with the same DE FG24 device in each solvent, **(c)** the V_{OC}'s associated with the same CE FG24 device when sequentially measured in xylene and Milli-Q water, and **(d)** the LSV curves associated with the same CE FG24 device in each solvent.

4. Performance of devices in methanol with the addition of salts

This section provides the OCP and LSV plots associated with data presented in the bar graphs of **Figure 4**.

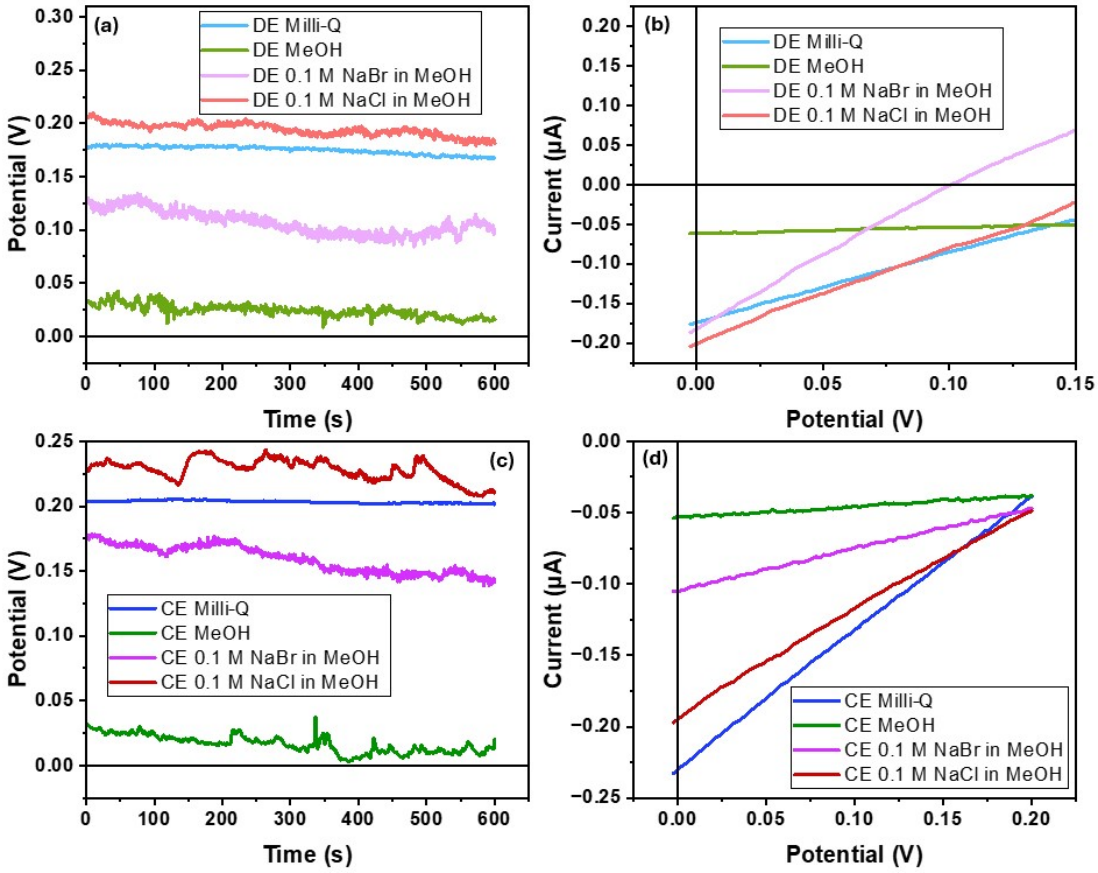

Figure S4. (a) The OCP's associated with DE FG24 devices measured in Milli-Q, methanol (MeOH), 0.1 M NaBr solution in MeOH, and 0.1 M NaCl solution in MeOH, **(b)** the LSV plots of the same DE FG24 devices in the same solutions, **(c)** the OCP's associated with CE FG24 devices measured in Milli-Q, MeOH, 0.1 M NaBr solution in MeOH, and 0.1 M NaCl solution in MeOH, **(d)** the LSV plots of the same CE FG24 devices in the same solutions.

5. Preparation of functionalized graphite

This section provides detail regarding the functionalization of graphite for the production of FG24.

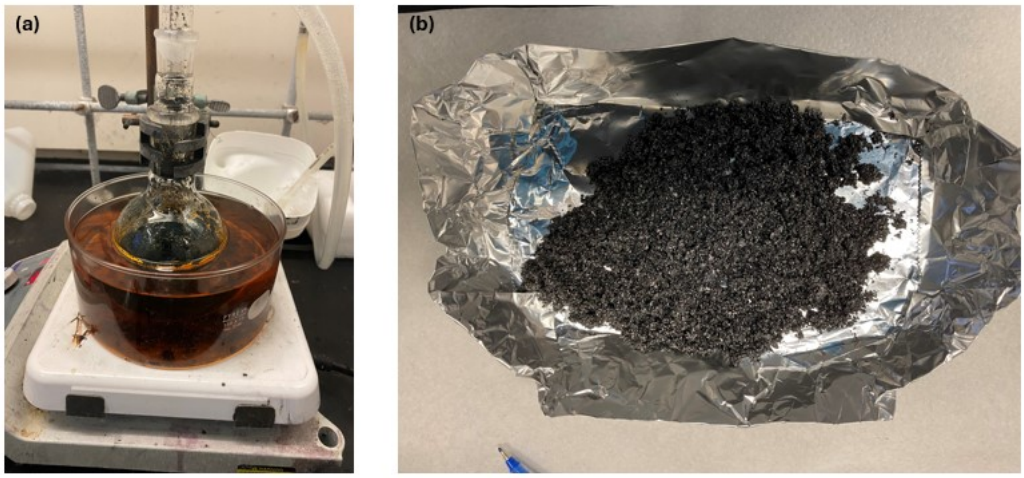

Figure S5. (a) An image of the functionalization of graphite in H_2SO_4 and HNO_3 at 90 ^{0}C under reflux, and **(b)** an image of FG24 material after washing and drying.

6. Measurement setup

This section demonstrates how FG24 devices were set-up for measurement.

Figure S6. A DE FG24 device with CNT electrodes connected to a potentiostat for measurement.