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Supplemental information

**Electrocatalytic fuel cell desalination
for continuous energy and freshwater generation**

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1. Supplemental Experimental Procedures

Scanning electron microscopy and Raman spectroscopy

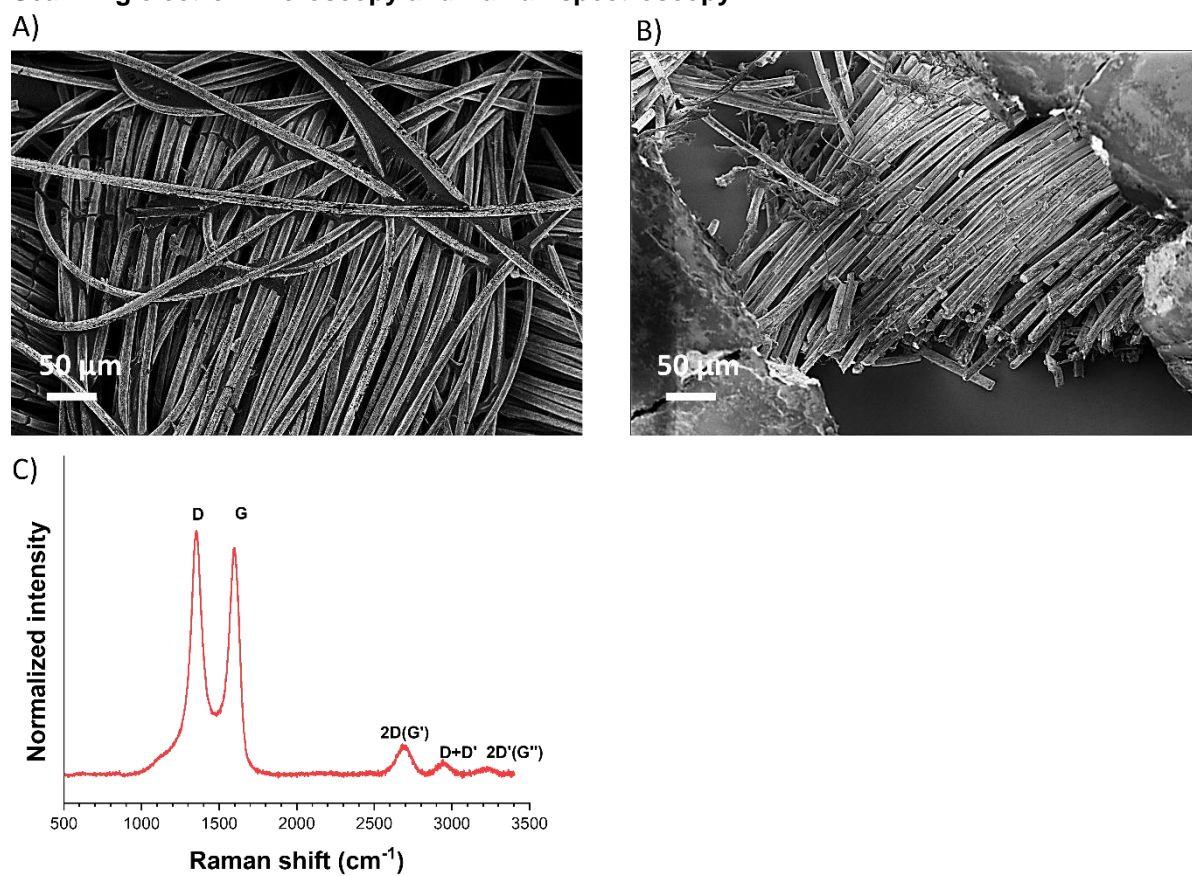


Figure S1: Electrode characterizations. A) Scanning electron micrograph of the gas diffusion layer (GDL). B) the crack point of the microporous carbon with platinum-coated layer after the desalination experiment in 600 mM NaCl solution. C) Raman spectrum of the Pt-C electrode before desalination experiments.

Experimental setup

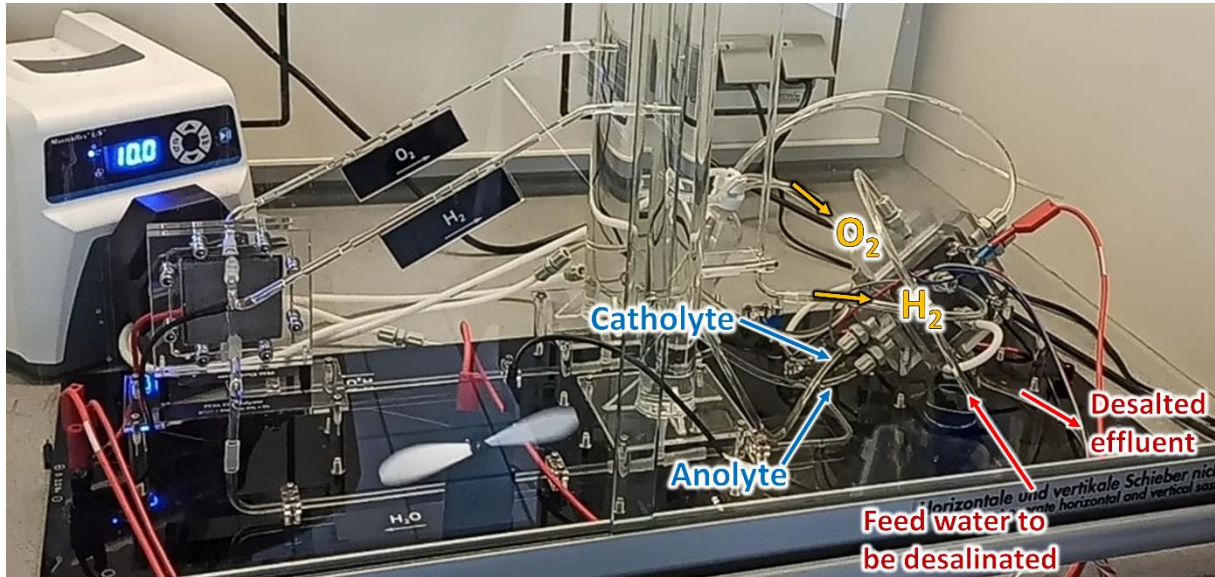


Figure S2: Photograph of the setup during continuous desalination operation. The desalination fuel cell has 5 channels, one for the feedwater, one pair for anolyte and catholyte, and one pair for H₂ and O₂.

X-ray diffraction

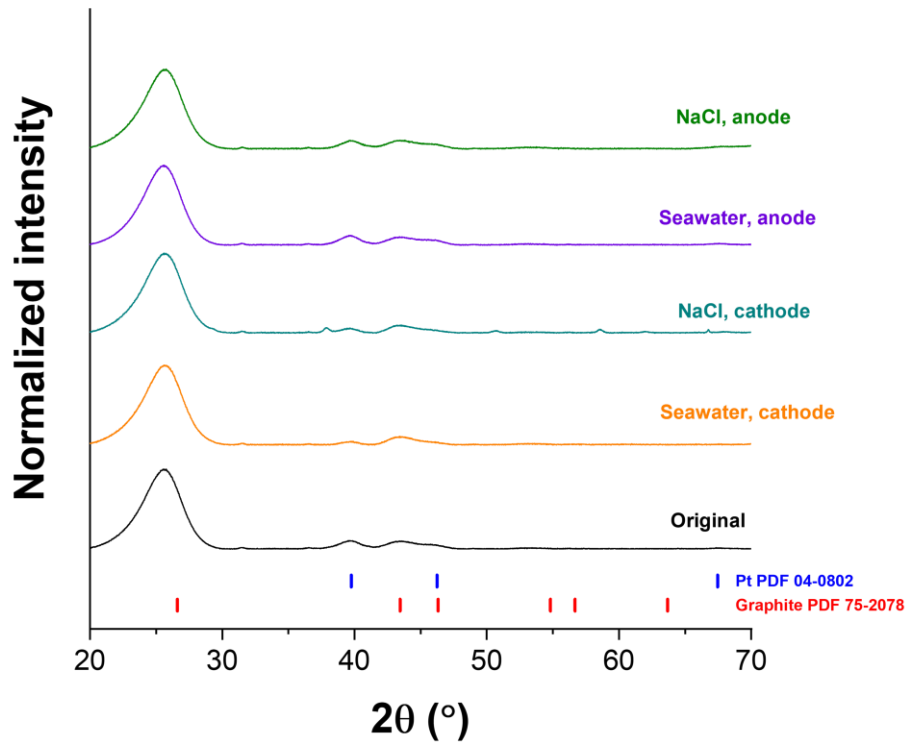


Figure S3: X-ray diffractograms of the PtC electrodes. XRD characterizations are conducted before and after desalination experiments in 600 mM NaCl and substitute ocean water.

Chemical composition

Table S1: The components of artificial sea water used in this study.

Ion	Concentration (mmol/L)
Na ⁺	477.5
K ⁺	9.322
Mg ²⁺	54.6
Ca ²⁺	10.45
Sr ²⁺	0.16
Cl ⁻	139.74
Br ⁻	0.85
F ⁻	0.071
SO ₄ ²⁻	28.79
BO ₃ ⁻	0.44
HCO ₃ ⁻	2.39
pH	~8