

Supplemental Information

Platinum-decorated Carbon Nanotubes for Hydrogen Oxidation and Proton Reduction in Solid Acid Electrochemical Cells

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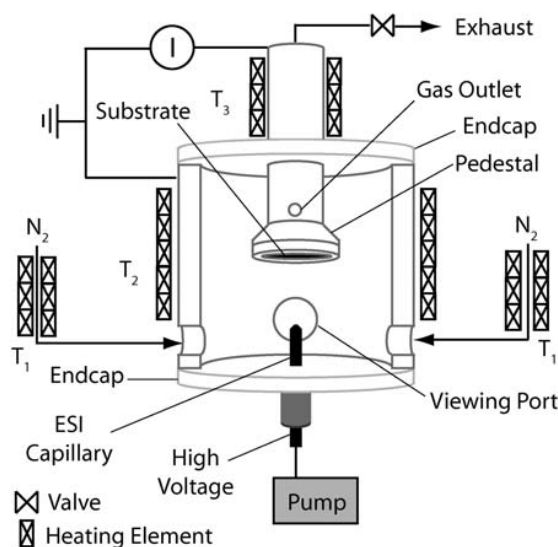


Figure S1. Schematic of the electro spray apparatus.¹

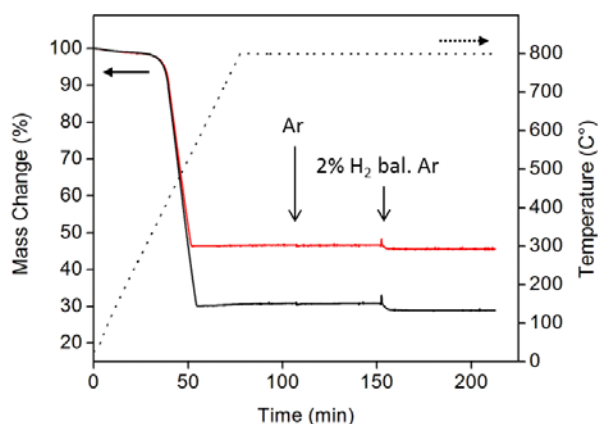


Figure S2. TGA profiles of 30 (red) and 46 wt% (black) Pt-CNTs under a flow of air, Ar, and 2.04% H₂ bal at 200 mL min⁻¹ and a heating rate of 10 °C min⁻¹. The negligible mass change (< 1%) upon switched from oxidizing to reducing atmosphere indicates there is negligible formation of PtO_x.

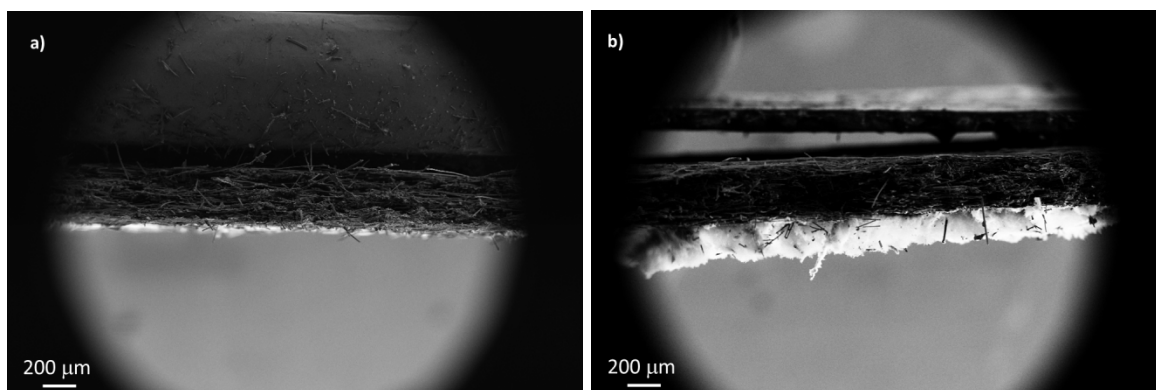


Figure S3. Cross-sectional SEM analysis of a) layered-composite and b) co-sprayed composite of 30 wt% Pt-CNT- CsH_2PO_4 from Strategies 1 and 2, respectively, illustrated in Scheme 2 in the main text. The straw-like layer is the carbon paper electrode and the thin white layer is the CsH_2PO_4 -based electrode.

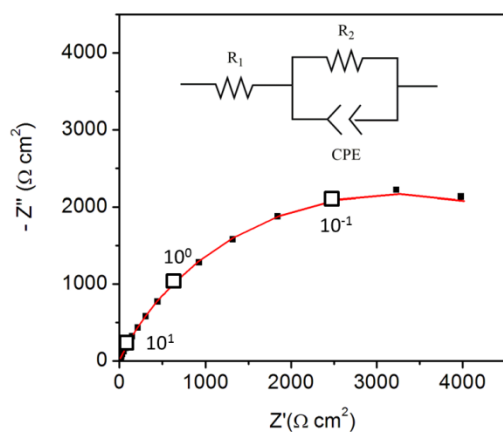


Figure S4. Symmetric cell impedance measurements of electrospayed commercial CNTs (as received). Measurements are performed at 240 °C in a dynamic atmosphere of 0.4 atm H_2O and balance H_2 supplied at a gas velocity of 6 cm min^{-1} (inset: equivalent circuit used for fitting).

1. A. Varga, N. A. Brunelli, M. W. Louie, K. P. Giapis and S. M. Haile, *J. Mater. Chem.*, 2010, **20**, 6309.