Supplemental Information

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

V. Sara Thoi\textsuperscript{a}, Robert E. Usiskin\textsuperscript{a}, and Sossina. M. Haile\textsuperscript{a}

Figure S1. Schematic of the electrospray apparatus.\textsuperscript{1}

Figure S2. TGA profiles of 30 (red) and 46 wt\% (black) Pt-CNTs under a flow of air, Ar, and 2.04\% H\textsubscript{2} bal at 200 mL min\textsuperscript{-1} and a heating rate of 10 °C min\textsuperscript{-1}. The negligible mass change (<1\%) upon switched from oxidizing to reducing atmosphere indicates there is negligible formation of PtO\textsubscript{x}. 

Electronic Supplementary Material (ESI) for Chemical Science. This journal is © The Royal Society of Chemistry 2014
Figure S3. Cross-sectional SEM analysis of a) layered-composite and b) co-sprayed composite of 30 wt% Pt-CNT-CsH₂PO₄ 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 CsH₂PO₄-based electrode.

Figure S4. Symmetric cell impedance measurements of electrosprayed commercial CNTs (as received). Measurements are performed at 240 °C in a dynamic atmosphere of 0.4 atm H₂O and balance H₂ supplied at a gas velocity of 6 cm min⁻¹ (inset: equivalent circuit used for fitting).