

## Supporting Information

### Controlled Electrodeposition of Nanostructured Pd Thin Films From Protic Ionic Liquids for Electrocatalytic Oxygen Reduction Reactions

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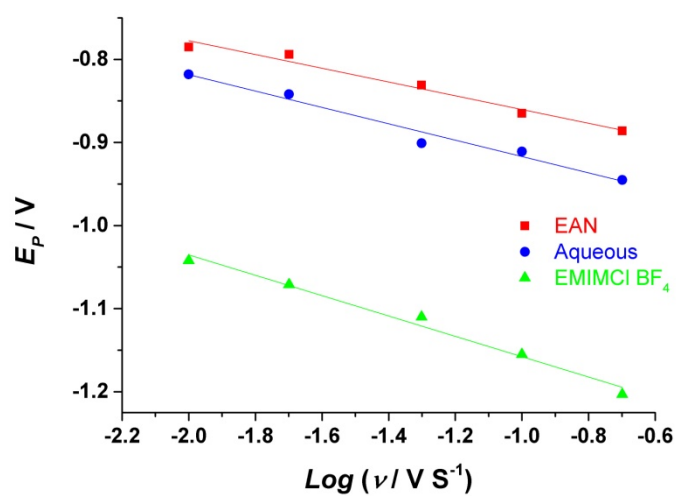


Figure S1. Dependence of peak potential,  $E_p$  on  $\log u$

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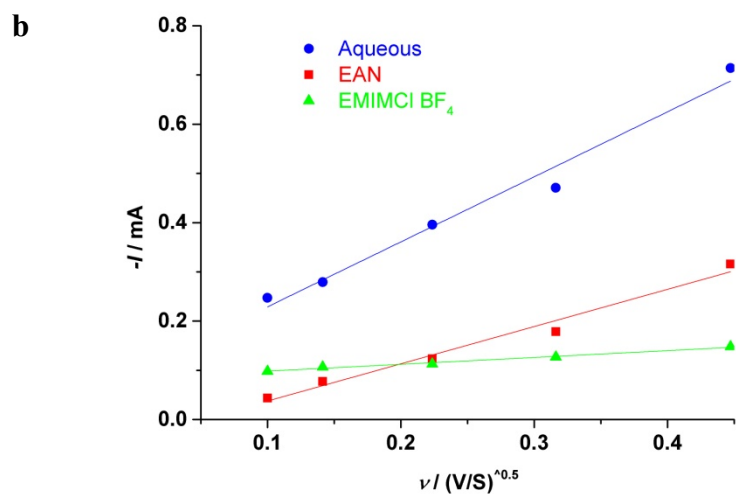
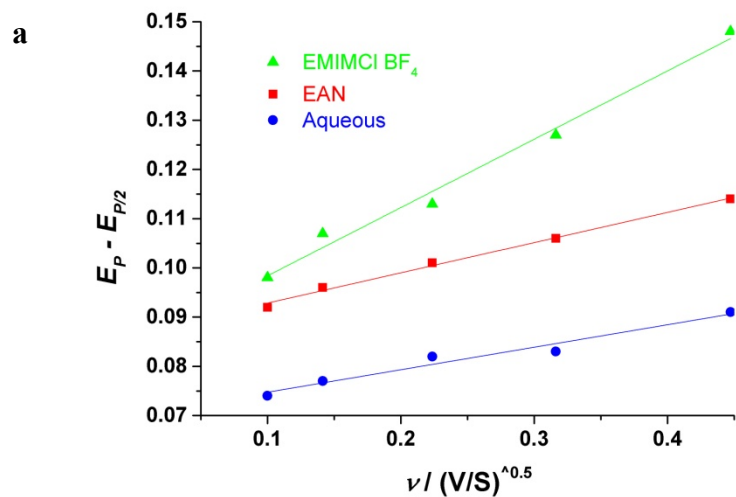


Figure S2. Analyzed curves extracted from cyclic voltammograms for electrodeposition of Pd from different electrolytes, a) dependence of  $E_p - E_{p/2}$  on  $U^{1/2}$  for charge transfer coefficient determination, b) dependence of  $I_p$  on  $U^{1/2}$  for diffusion coefficient determination

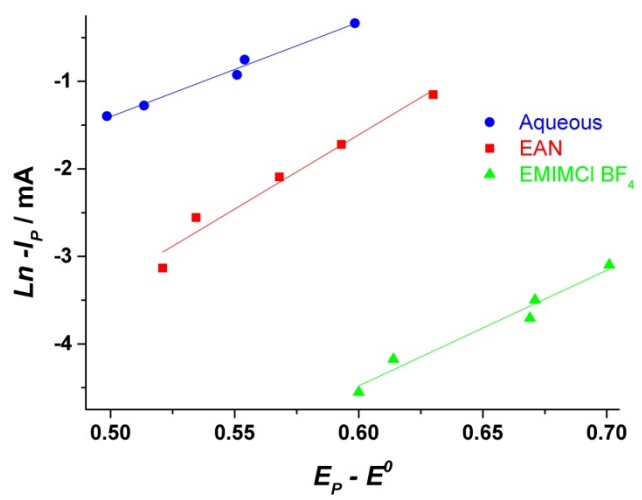


Figure S3. Kinetic constant calculation for Pd reduction

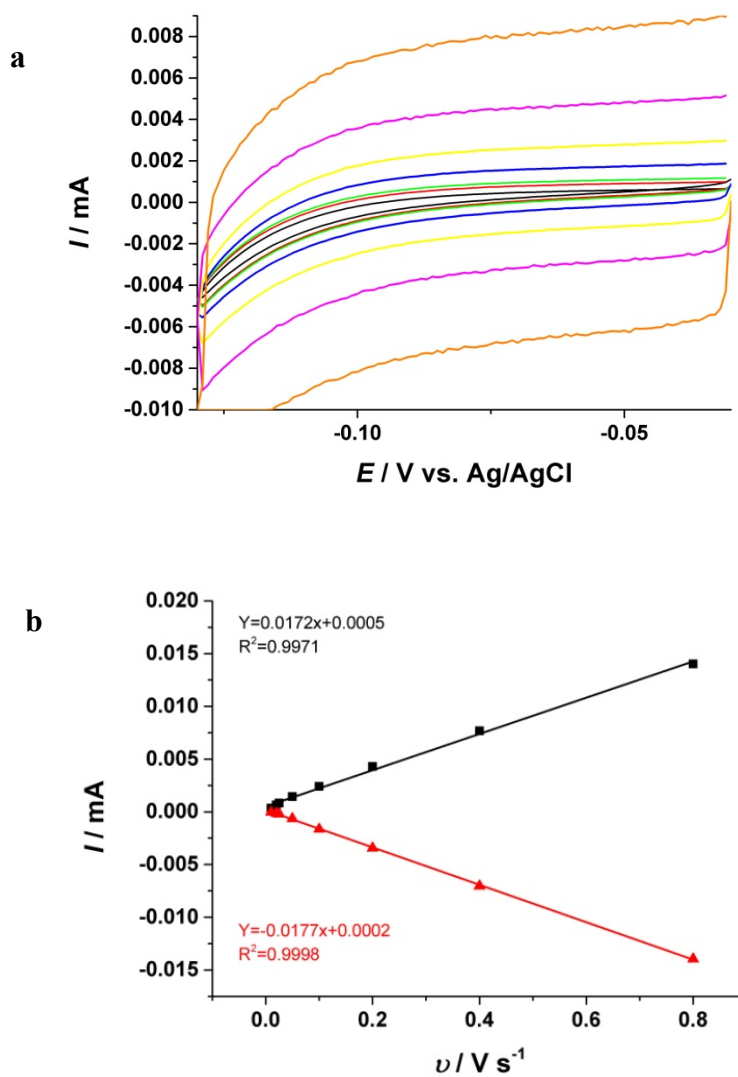


Figure S4. Double-layer capacitance measurements for determining ECSA of Pd electrodeposited from EAN in 1 M KOH, a) cyclic voltammetry in a non-Faradaic region of the voltammogram at scan rates of 0.01, 0.02, 0.025, 0.05, 0.1, 0.2, 0.4, and 0.8 V/S. b) cathodic and anodic currents at -0.08 V vs. Ag/AgCl versus scan rate