

## Supporting Information

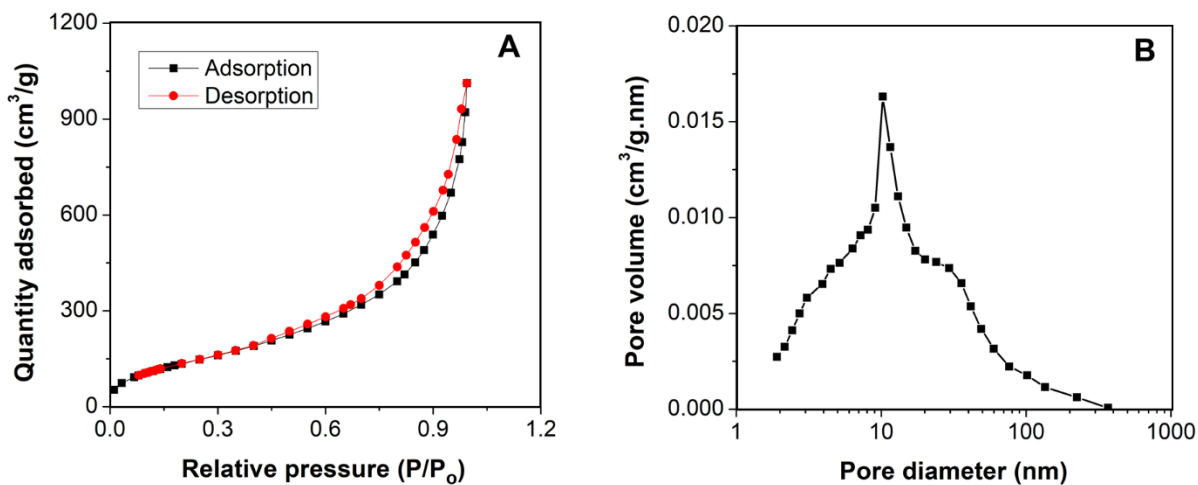
### **The influence of hydrofluoric acid etching process on the photocatalytic hydrogen evolution reaction using mesoporous silicon nanoparticles**

Sarah A. Martell,<sup>a</sup> Ulrike Werner-Zwanziger<sup>a</sup> and Mita Dasog<sup>a\*</sup>

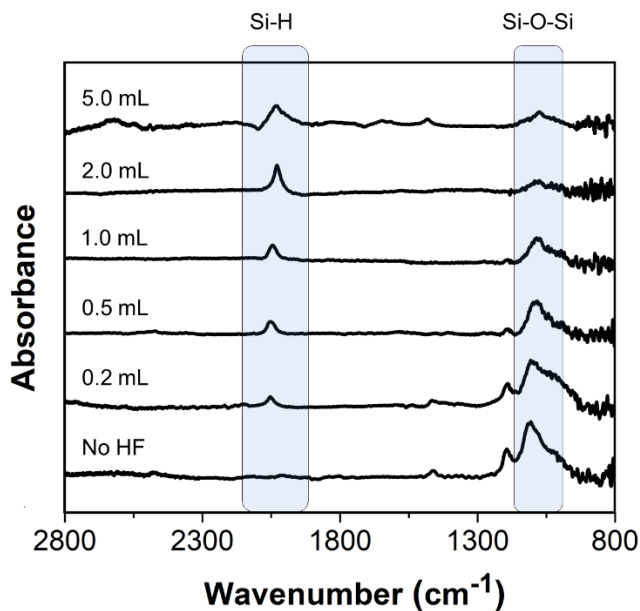
<sup>a</sup>Department of Chemistry, Dalhousie University, 6274 Coburg Road, Halifax, NS, Canada

\*Email: mita.dasog@dal.ca

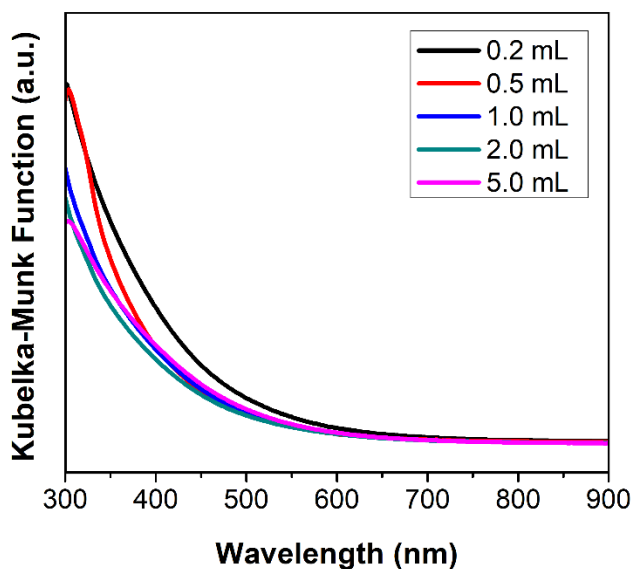
**Figure S1.** (A) N<sub>2</sub> adsorption and desorption isotherm and (B) pore size distribution of unetched mp-Si nanoparticles.



**Figure S2.** ATR spectrum of mp-Si nanoparticles, before and after etching with varying volumes of 48% HF acid.



**Figure S3.** Absorption (Kubelka-Munk function) spectra of mp-Si nanoparticles after etching with varying volumes of 48% HF acid.



**Figure S4.** N<sub>2</sub> adsorption and desorption isotherms of HF treated mp-Si nanoparticles.

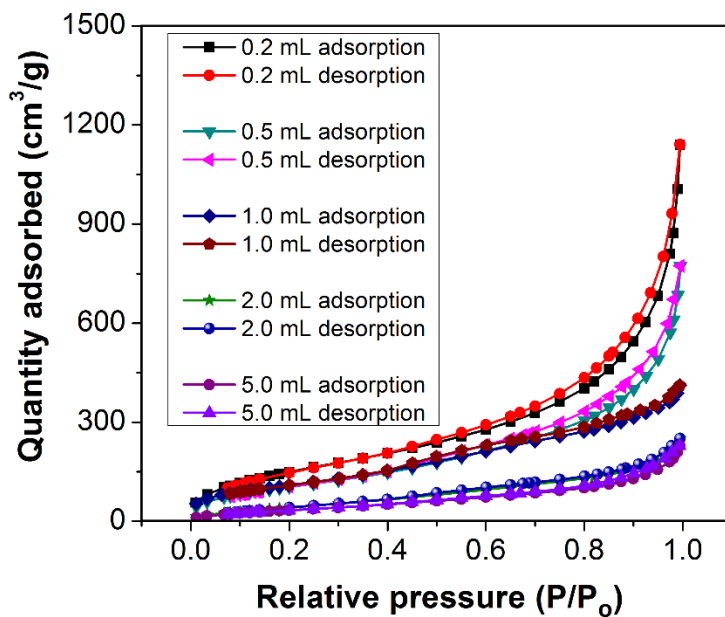
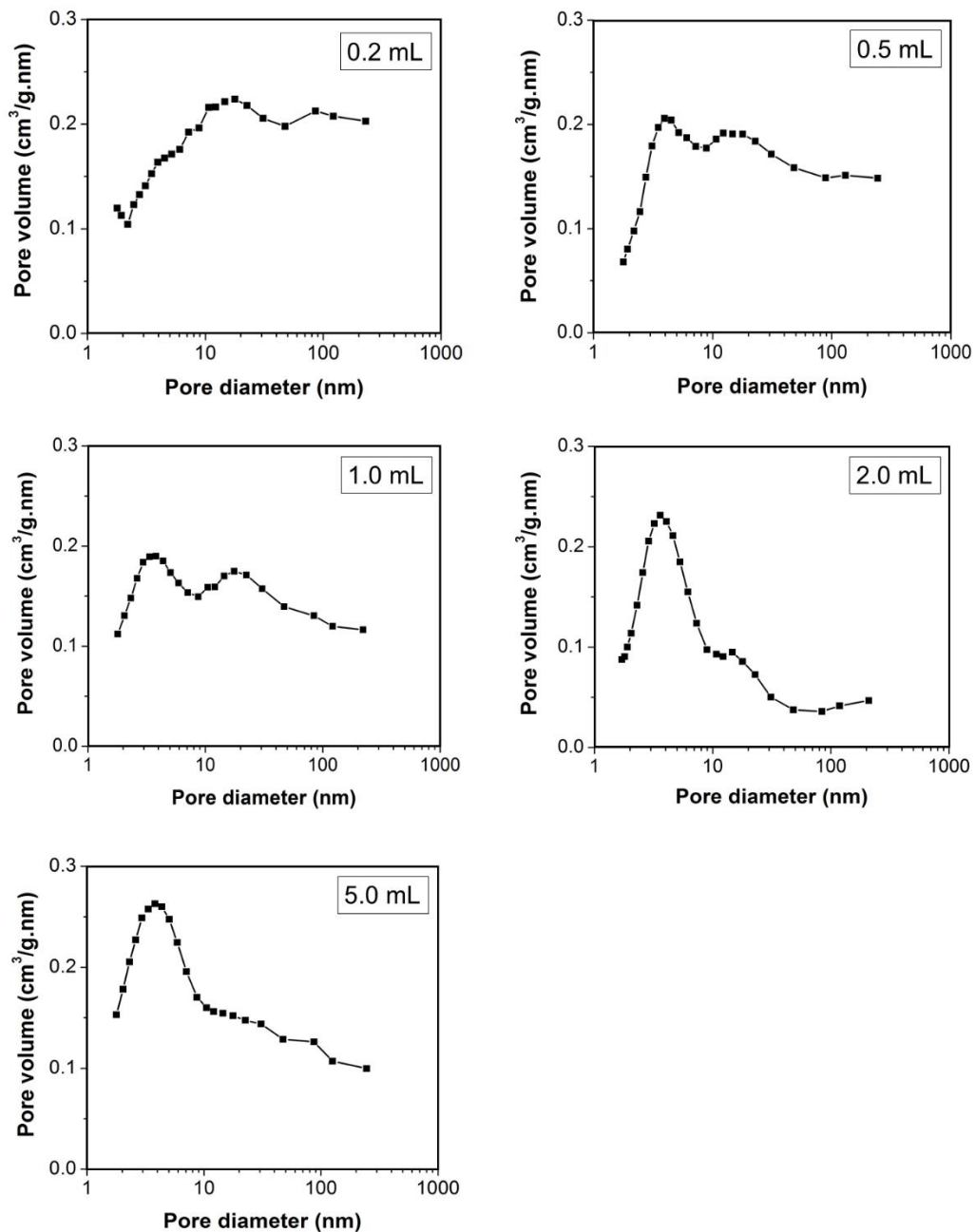
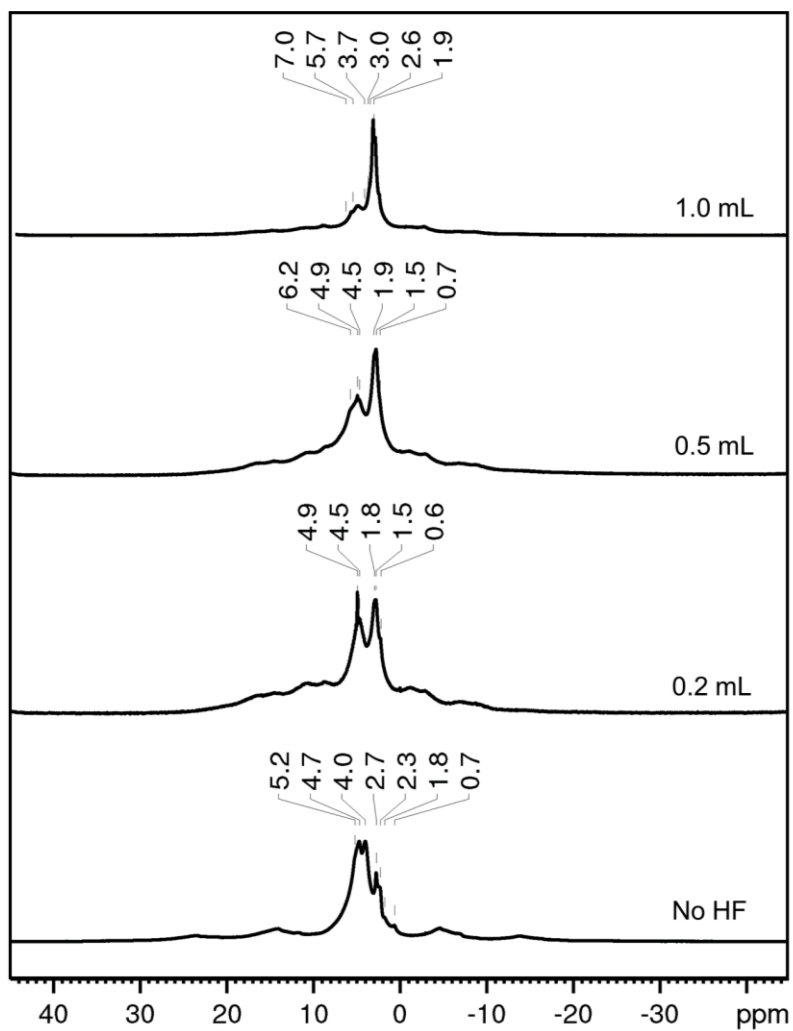


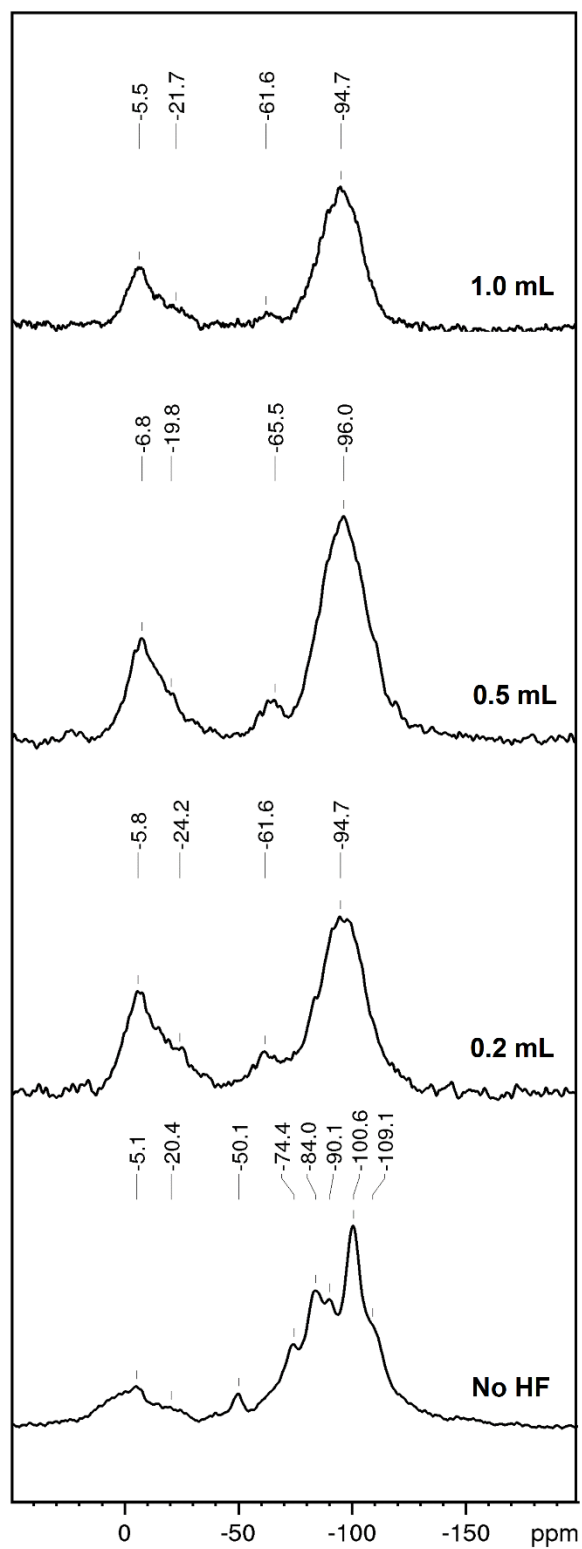
Figure S5. Pore size distribution in mp-Si nanoparticles treated with HF acid.



**Figure S6.**  $^1\text{H}$  ssNMR spectra of unetched mp-Si nanoparticles and those etched with 1.0 mL, 0.5 mL, 0.2 mL of HF acid. The sharp feature around 5 ppm stems from residual solvent.



**Figure S7.**  $^{29}\text{Si}\{^1\text{H}\}$  CP/MAS spectra of unetched and etched mp-Si nanoparticles.



**Figure S8.**  $^{29}\text{Si}\{^1\text{H}\}$  CP/MAS spectra of unetched and etched mp-Si nanoparticles overlaid on top of each other. The spectra are normalized to the peak at  $\sim -5$  ppm.

