Supporting information

Carbonated water for the separation of carboxylic compounds: a chromatography approach

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Reference

Amine functional group density

The density of functional groups is calculated based upon the weight percentage of nitrogen on the functionalized silica spheres. For example, in 100 g of dried primary amine functionalized silica material, there is 0.51 g of nitrogen. The amine group density in each gram of dry material is calculated as follows:

$$N = \frac{w}{M_w} \frac{1}{100\ g}$$

$$= \frac{0.51\ g}{14.0\ g\ mol^{-1}} \frac{1}{100\ g}$$

$$= 0.364\ mmol\ g^{-1}$$

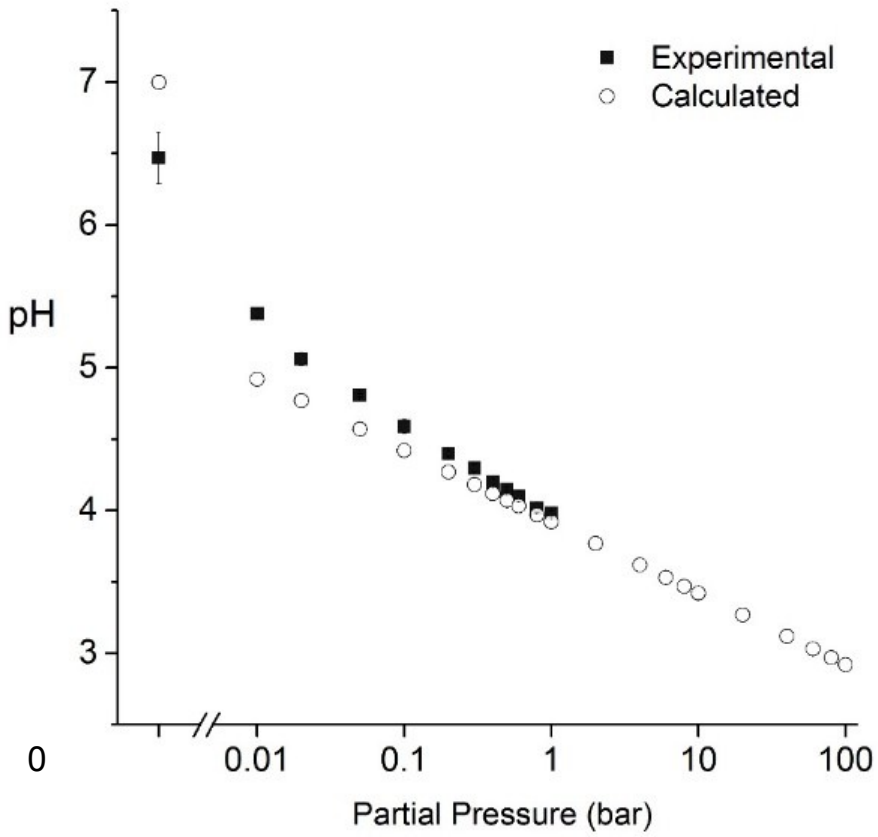

Figure S-1. The measured pH of CO_2 dissolved in water produced post-pump by mixing different ratios of CO_2-saturated water (1 bar) and N_2 bubbled water; calculated pH of CO_2 dissolved water at different CO_2 partial pressure. The plot identifies the pH range accessible with a water / CO_2-modified solvent system. This figure is reproduced from another paper.*

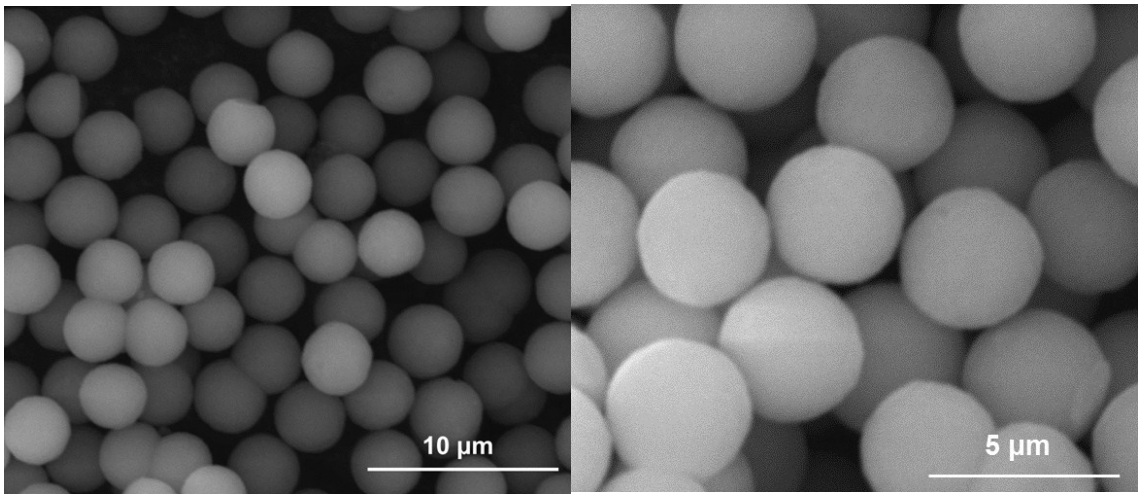

Figure S-2. Representative scanning electron microscope images of silica spheres after the functionalization reaction at two different magnifications. The images are obtained from a FEI MLA 650 FEG Scanning Electron Microscopy.

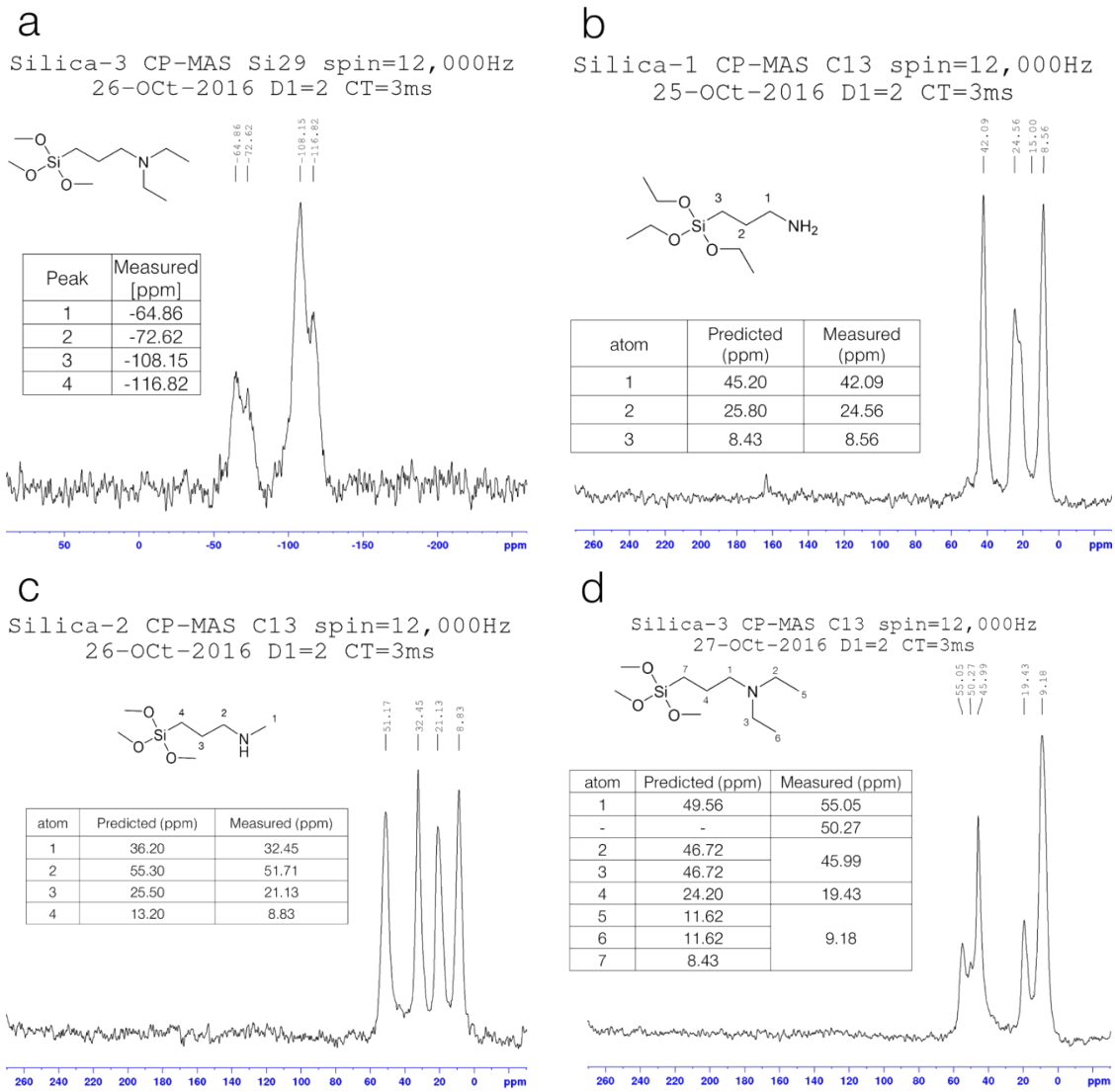

Figure S-3. Solid-state NMR spectra and peak assignments. (a) ^{29}Si NMR spectrum of tertiary amine functionalized silica. (b) ^{13}C NMR spectrum of primary amine functionalized silica. (c) ^{13}C NMR spectrum of secondary amine functionalized silica. (d) ^{13}C NMR spectrum of tertiary amine functionalized silica.

Reference

* Yuan, X.; Kim, E. G.; Sanders, C. A.; Richter, B. E.; Cunningham, M. F.; Jessop, P. G.; Oleschuk, R. D. *Green Chemistry* **2017**, *19*, 1757-1765.