Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Synthesis of Mesoporous Palladium with High Thermal Stability and Tunable Pore Size for Hydrogen Isotope Storage

Patrick J. Cappillino[a], Khalid M. Hattar[b], Blythe G. Clark[b], Ryan J. Hartnett[a], Vitalie Stavila[a], Michelle A. Hekmaty[a], Benjamin W. Jacobs[c], and David B. Robinson[a,*]

[a] *Sandia National Laboratories, PO Box 969, Mail Stop 9292, Livermore, CA, USA. Tel: 925-294-6613 E-mail: drobins@sandia.gov*
[b] *Protochips, Inc, 617 Hutton Street Suite 111, Raleigh, NC, USA. Tel: 919-341-2612*

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Supplemental Information: Figures S1-S5, Table S1, description of video

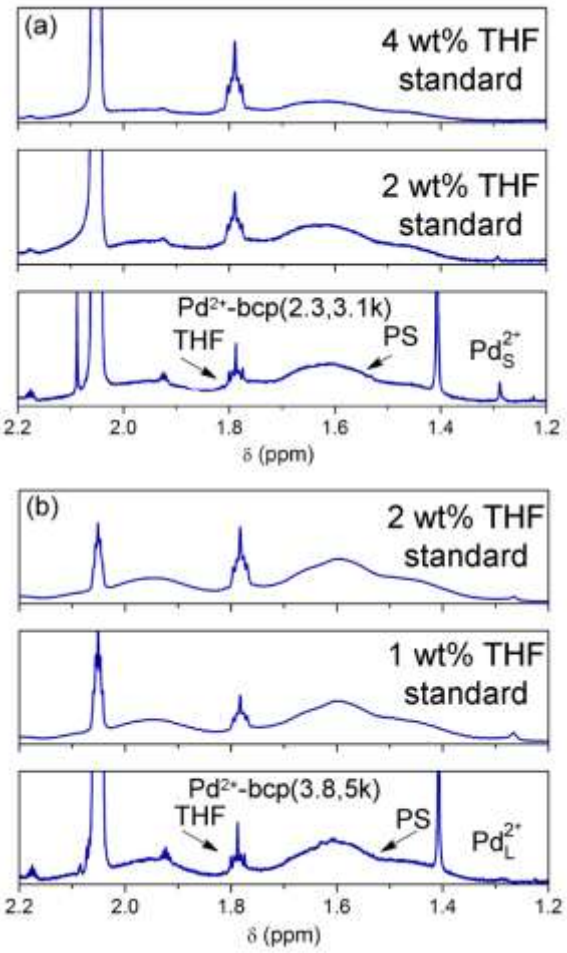

Figure S1. NMR spectra of bcp(2.3,3.1k) (a) and bcp(3.8,5k) (b) in d_6-acetone. Top two spectra in (a) and (b) are calibration standards and bottom spectra are Pd^{2+}-loaded LLC pastes subsequent to THF removal, immediately prior to metal salt reduction

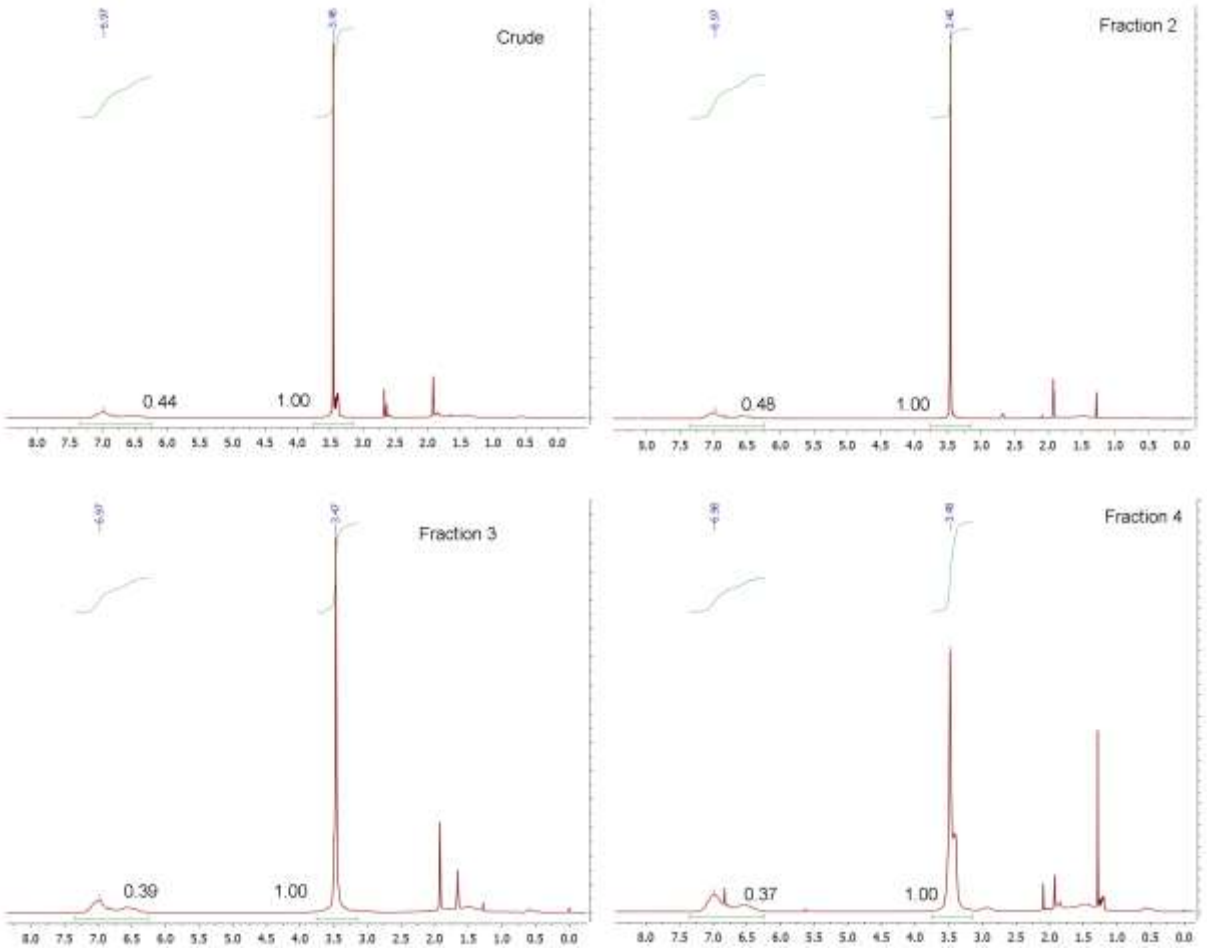

Figure S2. NMR spectra of the THF wash subsequent to Pd_S synthesis (crude) and fractions two, three and four from THF elution on a silica column (60 mL fractions), in d_6-acetone. Peaks between 7.35 and 6.25 ppm are from the poly(styrene) block, and peaks between 3.75 and 3.15 are from the poly(ethylene oxide) block.

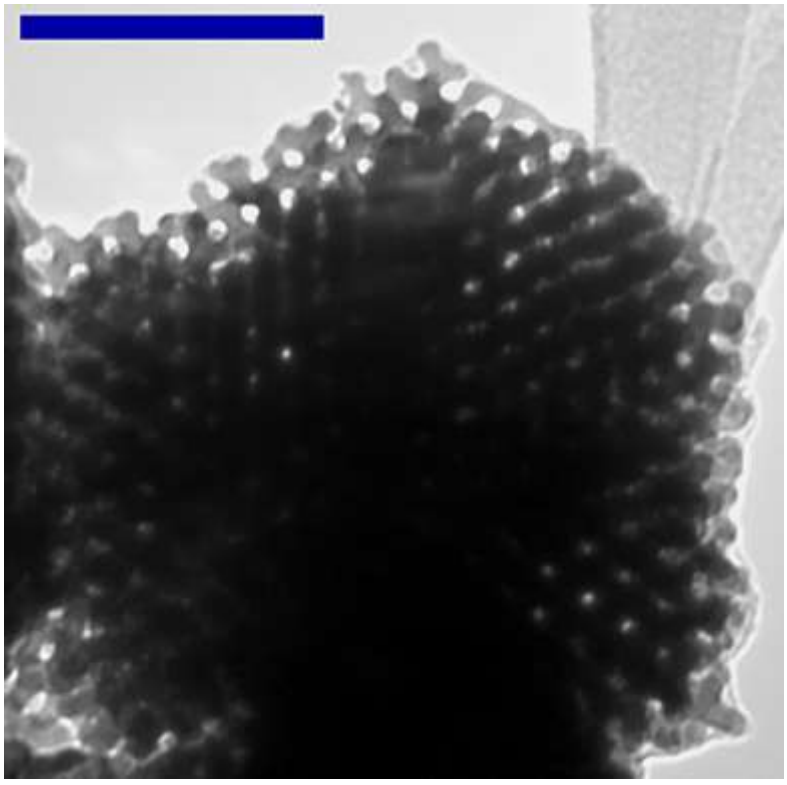

Figure S3. Porous Pd (Pd_S) synthesized from bcp(2.3,3.1k) purified after an initial use and recycled. (scalebar is calibrated to 100 nm)

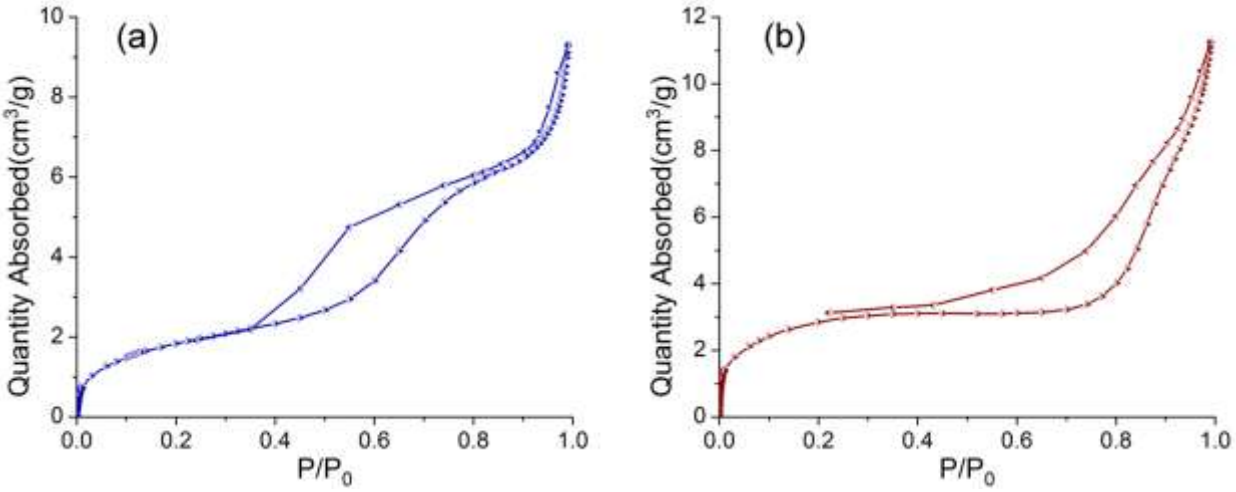

Figure S4. Nitrogen adsorption isotherms collected at 77K for Pd_S (a) and Pd_L (b)

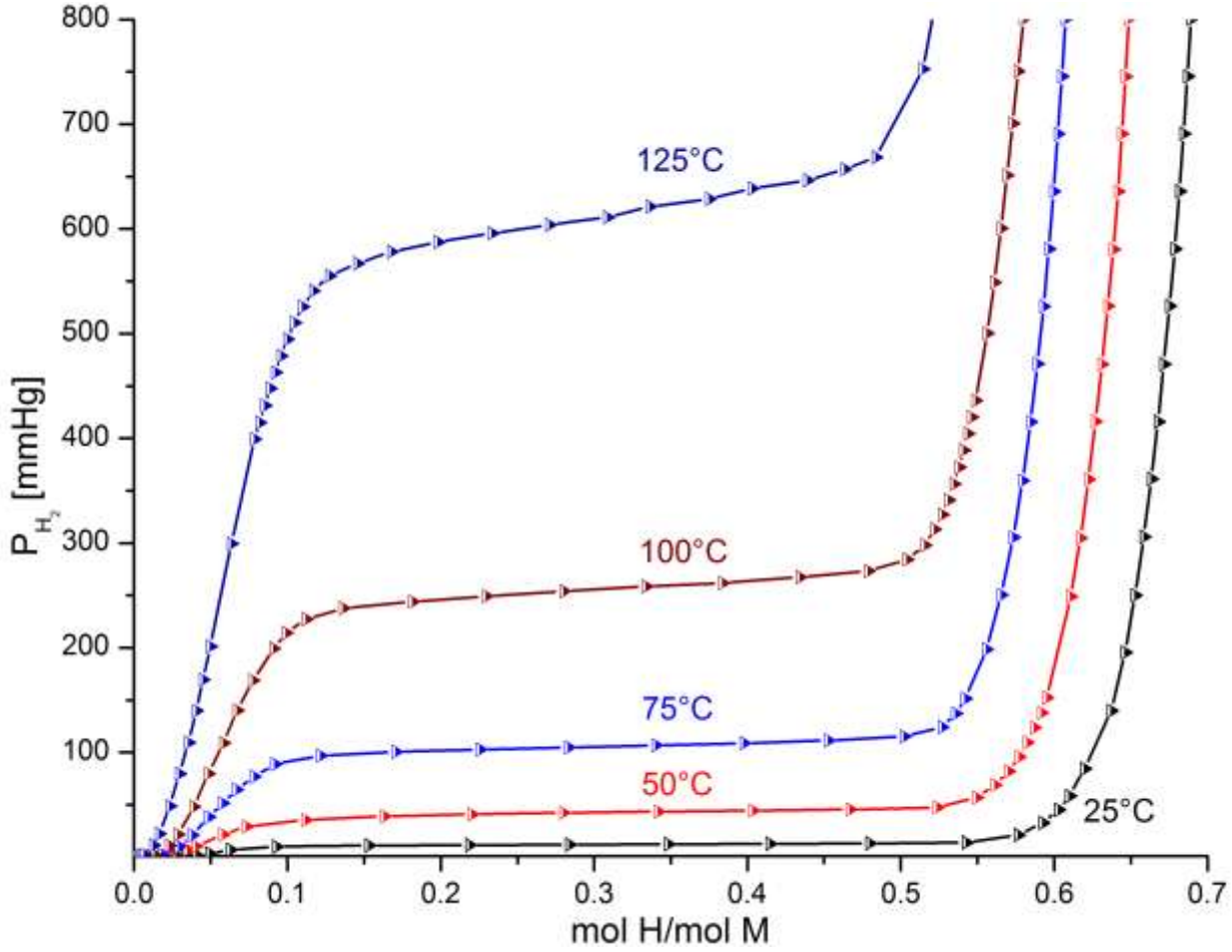

Figure S5. Linear H_2 storage isotherms at temperatures from 25°C to 125°C

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Table S1. Rietveld refinement results

Sample 3.8,5k

Space group (No.)	F m -3 m (225)
Lattice parameters	
a=b=c/ Å	3.8909(3)
α=β=γ/ °	90
V/ 10^6 pm^3	58.90426
Pref. orientation direction/ hkl	1.00 0.00 0.00
Pref. orientation parameter	0.947(6)
R (Bragg)/ %	1.14
Crystallite Size/ Å	105.0

Sample 2.3,3.1

Space group (No.)	F m -3 m (225)
Lattice parameters	
a=b=c/ Å	3.8912(1)
α=β=γ/ °	90
V/ 10^6 pm^3	58.91829
Pref. orientation direction/ hkl	0.00 0.00 1.00
Pref. orientation parameter	1.015428
R (Bragg)/ %	1.17
Crystallite Size/ Å	198.4

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Description of supplemental video: The video, encoded with the Windows Media Video 9 codec in Adobe Premier, shows the particle in Figure 8 during the first 6 s pulse to 250°C. The video is about 50% slower than real time. A drift correction algorithm written by Joshua D. Sugar and David B. Robinson of Sandia National Laboratories was applied, and is the cause of the shifting border.