Supporting Information for:

Exploring the Effect of Porous Structure on Thermal Conductivity in

Templated Mesoporous Silica Films

Yan Yan,[†] *Sophia C. King,*[†] *Man Li,*[‡] *Tiphaine Galy,*[‡] *Michal Marszewski,*[‡] *Joon Sang Kang,*[‡] *Laurent Pilon,*[‡] *Yongjie Hu,*[‡] and *Sarah H. Tolbert*[†,§,*]

[†]Department of Chemistry and Biochemistry, University of California – Los Angeles, Los Angeles, California 90095-1569, United States

[‡]Department of Mechanical and Aerospace Engineering, University of California – Los Angeles, Los Angeles, California 90095-1597, United States

[§]Department of Materials Science and Engineering, University of California – Los Angeles, Los Angeles, California 90095-1595, United States

*Corresponding Author: Sarah H. Tolbert; E-mail: tolbert@chem.ucla.edu; Phone: (310) 206-4767

Table S1: Porosity, Surface Area and Specific Heat Capacity of F127 and P123 Templated Sol-Gel and Nanoparticle-Based Mesoporous Silica Powders

Sample	Surfactant	Building block	Porosity[‡]	Surface Area[‡], S_{BET}, (m²/g)	Specific heat capacity, c_P (J/g K)
P1[*]	Non-templated	Sol-gel	N/A	N/A	0.75
P2[*]	F127	Sol-gel	N/A	N/A	0.71
P3	F127	Sol-gel	0.33	354	0.74
P4	P123	Sol-gel	0.54	479	0.79
P5	Non-templated	NP	0.44	345	0.77
P6	F127	NP	0.49	210	0.71
P7	F127	NP	0.57	398	0.72
P7	F127	NP	0.70	402	0.71

[‡]Measured using a Micromeritics TriStar II 3020 porosimeter at 77 K using N_2 as the adsorbate. The surface area was then deduced from the adsorption branch of the isotherm at low relative pressures using the Brunauer-Emmett-Teller (BET) model. The porosity was calculated using the total pore volume obtained from the adsorption branch at $P/P_o = 1$.

[*] Samples' surface area too low to measure using N_2 porosimetry

Table S2: Porosity, Film Thickness and Thermal Conductivity of F127 and P123 Templated Sol-Gel and Nanoparticle-Based Mesoporous Silica Films

Sample No.	Surfactant	Building block	Porosity	Thermal conductivity, vac. (W/mK)
F1	F127	Sol-gel	0.69 ± 0.01	0.106 ± 0.007
F2	F127	Sol-gel	0.62 ± 0.01	0.096 ± 0.009
F3	F127	Sol-gel	0.61 ± 0.01	0.14 ± 0.01
F4	F127	Sol-gel	0.57 ± 0.01	0.133 ± 0.007
F5	F127	Sol-gel	0.49 ± 0.01	0.19 ± 0.02
F6	F127	Sol-gel	0.46 ± 0.01	0.26 ± 0.02
F7	F127	Sol-gel	0.44 ± 0.01	0.24 ± 0.01
F8	F127	Sol-gel	0.40 ± 0.01	0.24 ± 0.01
F9	F127	Sol-gel	0.35 ± 0.02	0.24 ± 0.01
F10	F127	Sol-gel	0.25 ± 0.02	0.31 ± 0.02
F11	F127	Sol-gel	0.20 ± 0.02	0.37 ± 0.02
F12	F127	Sol-gel	0.19 ± 0.02	0.41 ± 0.02
F13	F127	Sol-gel	0.10 ± 0.02	0.52 ± 0.03
F14	F127	Sol-gel	0.10 ± 0.02	0.71 ± 0.04
F15	P123	Sol-gel	0.59 ± 0.01	0.081 ± 0.007
F16	P123	Sol-gel	0.55 ± 0.01	0.123 ± 0.007
F17	P123	Sol-gel	0.50 ± 0.01	0.165 ± 0.009
F18	P123	Sol-gel	0.43 ± 0.01	0.16 ± 0.01
F19	P123	Sol-gel	0.37 ± 0.02	0.18 ± 0.02
F20	P123	Sol-gel	0.3 ± 0.02	0.22 ± 0.01
F21	P123	Sol-gel	0.18 ± 0.02	0.40 ± 0.03
F22	P123	Sol-gel	0.17 ± 0.02	0.61 ± 0.04
F23	P123	Sol-gel	0.16 ± 0.02	0.52 ± 0.03
F24	P123	Sol-gel	0.15 ± 0.02	0.61 ± 0.03
F25	F127	NP	0.69 ± 0.01	0.083 ± 0.005
F26	F127	NP	0.68 ± 0.01	0.111 ± 0.006
F27	F127	NP	0.67 ± 0.01	0.149 ± 0.009
F28	F127	NP	0.66 ± 0.01	0.097 ± 0.006
F29	F127	NP	0.63 ± 0.01	0.115 ± 0.006
F31	F127	NP	0.63 ± 0.01	0.083 ± 0.005
F32	F127	NP	0.57 ± 0.01	0.152 ± 0.008
F33	F127	NP	0.56 ± 0.01	0.19 ± 0.01
F34	F127	NP	0.53 ± 0.01	0.20 ± 0.01
F35	F127	NP	0.43 ± 0.01	0.23 ± 0.01
F36	F127	NP	0.43 ± 0.01	0.31 ± 0.02
F37	F127	NP	0.41 ± 0.01	0.21 ± 0.01
F38	F127	NP	0.41 ± 0.01	0.27 ± 0.01

F39	F127	NP	0.40 ± 0.01	0.33 ± 0.02
F40	F127	NP	0.38 ± 0.02	0.34 ± 0.02
F42	F127	NP	0.37 ± 0.02	0.25 ± 0.02
F43	F127	NP	0.35 ± 0.02	0.29 ± 0.02
F44	F127	NP	0.35 ± 0.02	0.32 ± 0.02
F45	F127	NP	0.34 ± 0.02	0.32 ± 0.02
F46	F127	NP	0.33 ± 0.02	0.31 ± 0.02
F47	P123	NP	0.63 ± 0.01	0.093 ± 0.006
F48	P123	NP	0.62 ± 0.01	0.106 ± 0.008
F49	P123	NP	0.60 ± 0.01	0.102 ± 0.007
F50	P123	NP	0.59 ± 0.01	0.126 ± 0.009
F51	P123	NP	0.56 ± 0.01	0.115 ± 0.007
F52	P123	NP	0.55 ± 0.01	0.115 ± 0.006
F53	P123	NP	0.55 ± 0.01	0.104 ± 0.006
F54	P123	NP	0.51 ± 0.01	0.22 ± 0.01
F55	P123	NP	0.45 ± 0.01	0.19 ± 0.01
F56	P123	NP	0.44 ± 0.01	0.31 ± 0.02
F57	P123	NP	0.44 ± 0.01	0.25 ± 0.01
F58	P123	NP	0.42 ± 0.01	0.28 ± 0.01
F59	P123	NP	0.41 ± 0.01	0.30 ± 0.02
F60	P123	NP	0.39 ± 0.01	0.28 ± 0.02
F61	P123	NP	0.38 ± 0.02	0.23 ± 0.01
F62	P123	NP	0.37 ± 0.02	0.29 ± 0.02
F63	P123	NP	0.36 ± 0.02	0.37 ± 0.02
F64	P123	NP	0.35 ± 0.02	0.33 ± 0.02