Electronic Supplementary Information for

Designing of hierarchical porosity in tin oxide monoliths and their

application as solid acid catalyst

Yoshinao Suzuki,^a George Hasegawa,^b Kazuyoshi Kanamori,^{*a} and Kazuki Nakanishi^{*b,c}

^a Department of Chemistry, Graduate School of Science, Kyoto University, Kitashirakawa, Sakyo-ku, Kyoto 606-8502, Japan

^b Institute of Materials and Systems for Sustainability, Nagoya University, Furo-cho, Chikusa-ku, Nagoya, Aichi 464-8601, Japan

^c Institute for Integrated Cell-Material Sciences, Kyoto University, Yoshida, Sakyo-ku, Kyoto 606-8501, Japan

Correspondence: kanamori@kuchem.kyoto-u.ac.jp (K.K.), dknakanishi@imass.nagoya-u.ac.jp (K.N.)



Figure S1 Scanning electron micrographs of the as-dried samples prepared with different amounts of DMF. The starting compositions are listed in Table S1.



Figure S2 Mercury porosimetry results of the selected samples in Figure S1. Both pore size and volume increase with increasing amount of PPG.



Figure S3 XPS survey spectrum of the as-dried sample SZ-PPG120.



Figure S4 FTIR spectrum of the as-dried sample SZ-PPG120.



Figure S5 TG-DTA results of the as-dried sample SZ-PPG120.



Figure S6 Nitrogen isotherms at 77 K and BJH pore size distributions of the sample SZ-PPG120 obtained from supercritical and evaporative drying processes.



Figure S7 SEM images of the sample SZ-PPG120 solvothermally treated at different temperatures.



Figure S8 SEM images of the sample SZ-PPG120 calcined at different temperatures.



Figure S9 Raman spectra of the as-dried sample SZ-PPG120 and those calcined at different temperatures.



Figure S10 Conversion vs. reaction time in the catalytic tests on the esterification of valeric acid and methanol with the sample SZ-PPG120 calcined at 400 °C in different heating rates.

	SnCl ₄ ·5H ₂ O	DMF	PPG	РО	Gelation
	/g	/mL	/mg	/mL	time
					/min
SZ-DMF1.3	2.80	1.30	120	2.25	25
SZ-DMF2.3	2.80	2.30	120	2.25	65
SZ-DMF2.8	2.80	2.80	120	2.25	98
SZ-DMF3.3	2.80	3.30	120	2.25	180

Table S1 Starting compositions for the samples with varied DMF amount