Electronic Supplementary Information

Silica-anchored Organotin Trichloride: A Recyclable and Clean Organotin Catalyst for Transesterification Reactions

Thierry Toupance,*[a] Laetitia Renard,[a] Bernard Jousseaume,[a] Céline Olivier,[a] Vanja Pinoie,[b] Ingrid Verbruggen,[b] Rudolph Willem[b]

[a] *University of Bordeaux, Institut des Sciences Moléculaires, ISM UMR 5255 CNRS, C2M group, 33405 Talence Cédex, France. Fax: + 33 5 40006994; Tel: + 33 5 40002523; E-mail: t.toupance@ism.u-bordeaux1.fr*

[b] *High Resolution NMR Centre (HNMR), Department of Materials and Chemistry (MACH), Vrije Universiteit Brussel (UVB), Pleinlaan 2, B-1050 Brussels, Belgium.*

Solution ^{1}H and ^{13}C NMR spectroscopy

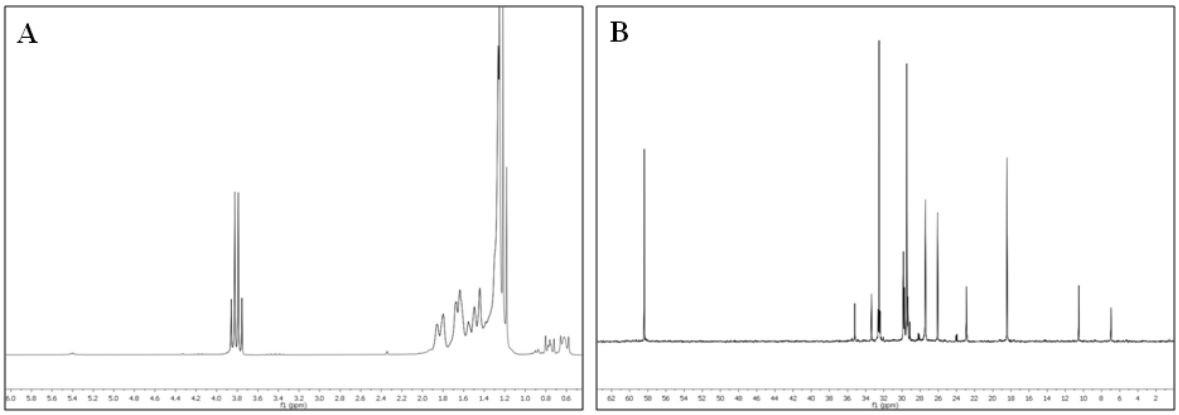

Figure S1: Solution ^{1}H (A) and ^{13}C (B) NMR spectra of precursor **2** recorded in $CDCl_3$

Solid-state ^{117}Sn MAS NMR spectroscopy

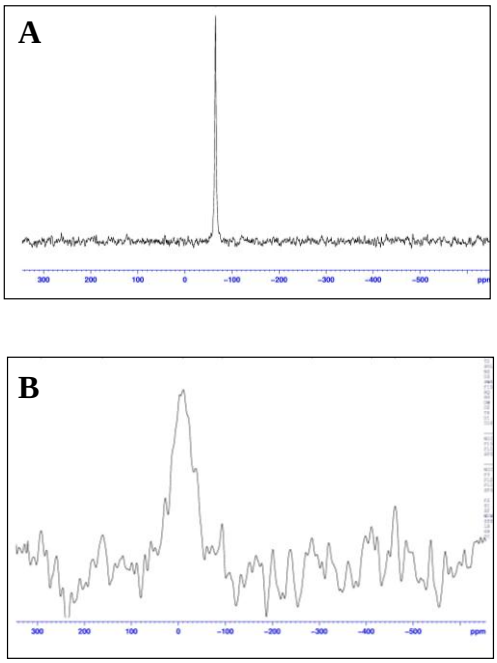

Figure S2: Solid-state ^{117}Sn MAS NMR spectra of hybrid material **3** (A) and hybrid catalyst **4** (B).

FTIR spectroscopy

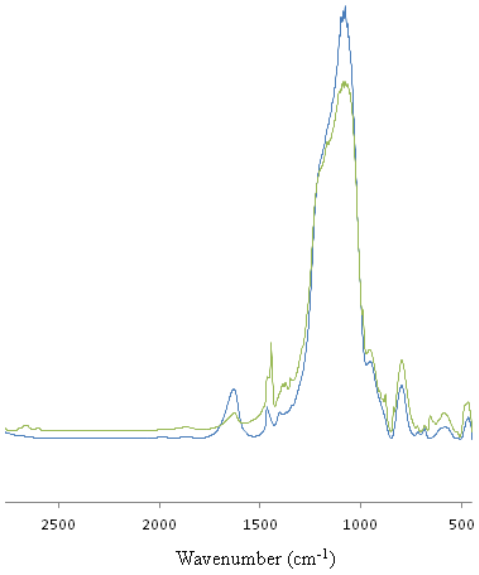

Figure S3: FTIR spectra (2500-400 cm^{-1} region) of hybrid material **3** (green) and hybrid catalyst **4** (blue).

Determination of the amount of precursor 2 included in hybrid material 3

Assuming that x is the amount of precursor **2** included in the inorganic network, complete thermolysis of hybrid material **3** should give (4 + x) moles of SiO_2 and x moles of SnO_2. According to ^{29}Si MAS NMR studies, neither hydrolysis nor condensation is complete (presence of T^2 and Q^3 sites). A hydroxyl group has been added to the starting silica mass and 0.5x mole of ethoxyl group has been added to the mass of the organotin precursor. Consequently, the mass loss determined by TGA recorded under air can be written as:

$$\text{Mass Loss (\%)} = \frac{(4*M(SiO2.5)+ xM(precursor))-[(4+x)M(SiO2)+ xM(SnO2)]}{4*M(SiO2.5)+ xM(precursor)}$$

The corresponding x value for hybrid materials **3**, **3a** and **3b** are gathered in Table S1.

Material	Mass Loss (%)	x value	Proposed Chemical Formula
3	43.0	0.7	$C_{23.9}H_{47.5}O_{11}Si_{4.7}Sn_{0.7}$
3a	44.5	0.8	$C_{25}H_{48}O_{12}Si_{4.8}Sn_{0.8}$
3b	41.0	0.6	$C_{19}H_{37}O_{11.3}Si_{4.6}Sn_{0.6}$

Table S1: Chemical formula proposed for hybrid materials **3**, **3a** and **3b**.

The chemical formula given for hybrid catalyst **4** in Table 1 was therefore inferred from microanalysis data by considering Si/Sn = 4.7/0.7.