Electronic Supplementary Information

Hierarchical Sn-MFI zeolites prepared by facile top-down methods for sugar isomerisation

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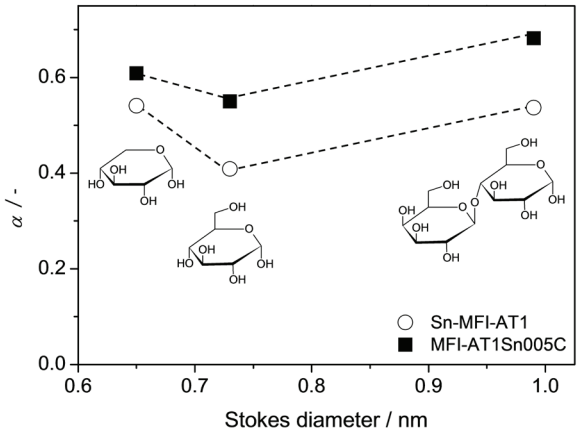

Fig. SI1 α (defined below) *versus* the Stokes diameter of the substrates for catalysts prepared *via* alkaline-treatment (Sn-MFI-AT1) and alkaline-assisted stannation (MFI-AT1Sn005C). The parameter α reflects the advantage of using a hierarchical with respect to a purely microporous Sn-containing material in the isomerisation of the three sugars. The Stokes diameter is the effective diameter of the substrates in water as determined in previous studies (Qi et al., *Bioresour. Technol.*, 2011, **102**, 7111; Shaffer *et al.*, *Adv. Powder. Technol.*, 2011, **22**, 454).

$$\alpha = \frac{\text{Yield of isomer at } t = 15 \text{ min over the post-synthesis treated sample}}{\text{Yield of isomer at equilibrium over the post-synthesis treated sample}} - \frac{\text{Yield of isomer at } t = 15 \text{ min over Sn-MFI-P}}{\text{Yield of isomer at equilibrium over Sn-MFI-P}}$$

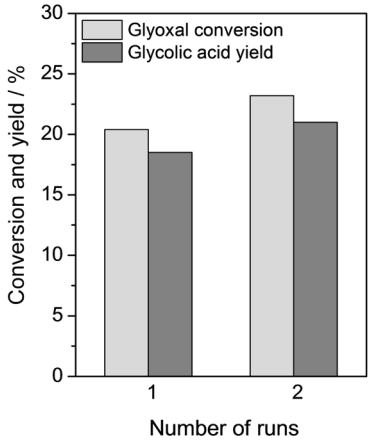

Fig. SI2. Conversion of glyoxal and yield of glycolic acid over MFI-AT1Sn005C at 363 K and 24 h in two consecutive catalytic runs.

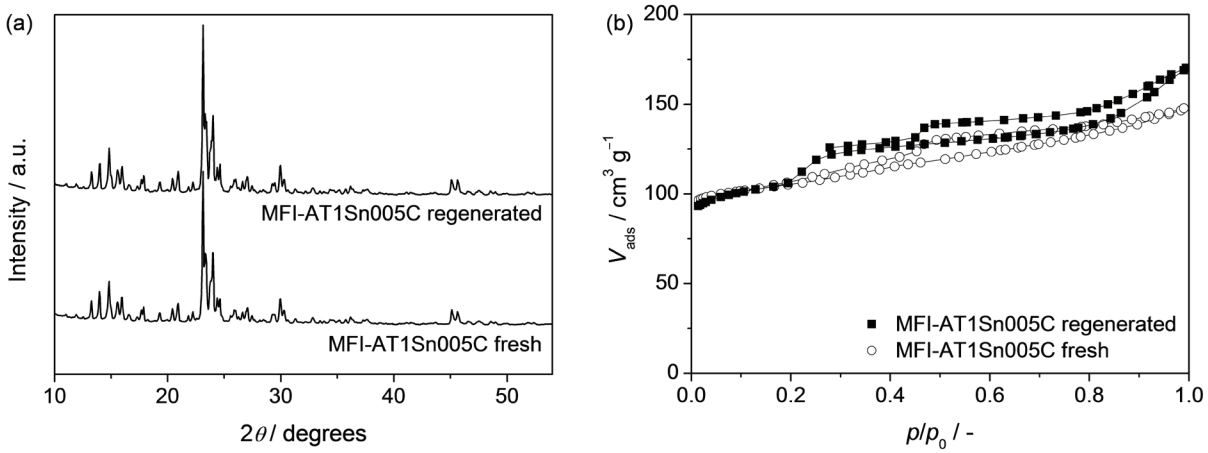

Fig. SI3. (a) X-ray diffraction patterns and (b) N_2 isotherms of MFI-AT1Sn005C in fresh form and after regeneration through calcination (823 K, 5 K min^{-1}, 5 h) in flowing air.

Table SI1 Yield of isomers (xylulose, fructose, and lactulose) over selected catalysts.

Substrate	Catalyst	Isomer yield at t =15 min	Isomer yield at t = 2 h
Xylose	Sn-MFI-AT1	6.5	8.5
	MFI-AT1Sn005C	6.9	8.2
Glucose	Sn-MFI-AT1	9.5	23.2
	MFI-AT1Sn005C	13.1	23.8
Lactose	Sn-MFI-AT1	12.1	22.5
	MFI-AT1Sn005C	17.0	24.5

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