Electronic Supplementary Material (ESI) for Green Chemistry.

Extended Supplementary Information for:

Intensification and deactivation of Sn-Beta investigated in the continuous regime

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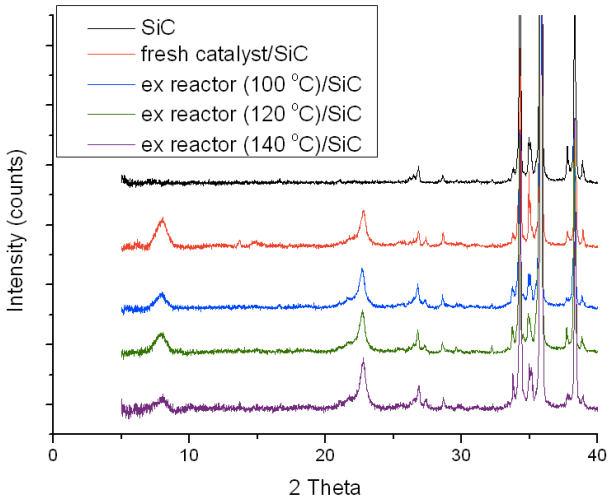

Figure S1. A selection of XRD patterns of ex reactor catalyst samples. From top to bottom: SiC, fresh catalyst/SiC mixture, ex reactor (100 ºC) sample/SiC mixture, ex reactor (120 °C) sample/SiC mixture, ex reactor (140 °C) sample/SiC mixture. All ex reactor samples were measured after 250 h on stream.

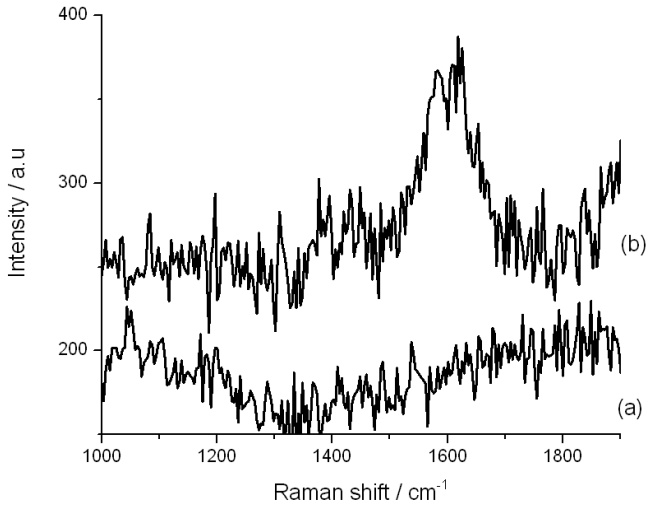

Figure S2. UV-Raman spectrum of (a) fresh catalyst/SiC mixture, and (b) ex reactor (140 °C) sample/SiC mixture after 150 h on stream. The presence of the carbon G-band clearly indicates the presence of carbonaceous material in the used sample.

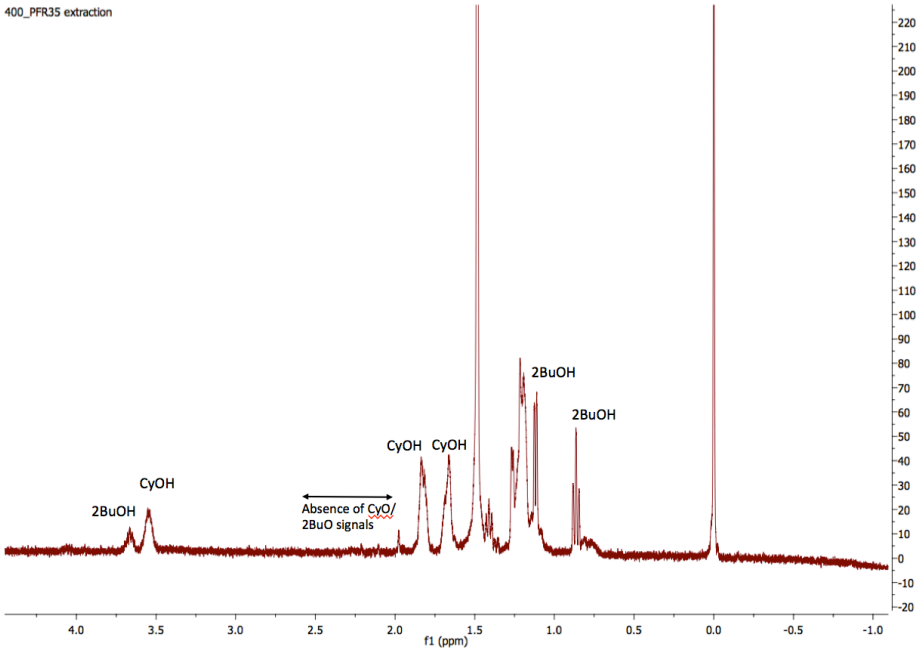

Figure S3. ^{1}H NMR spectra of the supernatant solution after washing the ex reactor catalyst in CD_3Cl. Clear resonances from both alcohol species (2-butanol and cyclohexanol) are observed, whilst no signals from the corresponding ketones are found.

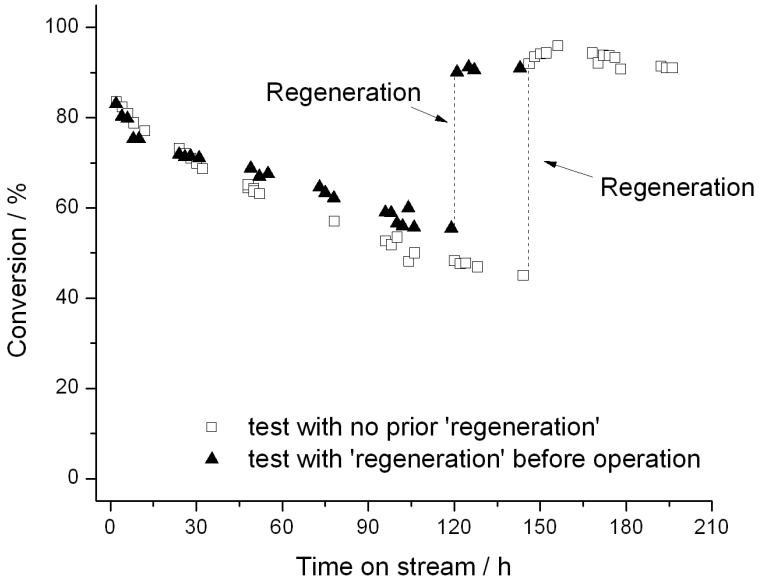

Figure S4. Catalytic activity of 10Sn-Beta during TH of furfural. Open squares represent the continuous experiment performed with fresh catalyst, whilst filled triangles represents a continuous test of the same sample tested after an initial 550 °C calcination prior to continuous operation.

Table S1. EDX analysis and porosimetry data from fresh and used Sn-Beta catalysts.

Catalyst	Sn wt. %[a,1]	SSA ($m^2\ g^{-1}$)[b,2]	V_{MICRO} ($cm^3\ g^{-1}$)[c,2]	normalized V_{MICRO} ($cm^3\ g^{-1}$)[c,2]
fresh catalyst/SiC	4.9 ± 0.5	66.5	0.046	0.23
ex reactor (140 °C) sample/SiC mixture after 150 h on stream	4.4 ± 0.6	26.4	0.022	0.11

[a]Determined by EDXS; [b]Specific surface area determined from nitrogen adsorption using the BET equation; [c]Micropore volume determined from nitrogen adsorption isotherms using the de Boer *t*-plot method.

[1] The entire catalyst sample (included diluent) was measured. Three different areas of 29 micron of diameter were analysed and the averaged value was taken. Values are not normalised for composition (*i.e.* % catalyst in mixture) due to issues with relative dispersion and the semi-surface sensitive nature of the technique.

[2] The entire catalyst sample (included diluent) was measured, and these are the raw values.

[3] Values were normalised from the data obtained in (2) according to the relative content of catalyst in the mixture, as the diluent does not contribute to the micropore volume.