



Supporting Information

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## Cat-in-a-cup: Facile separation of large homogeneous catalysts

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### Experimental Section

**Methods and Instrumentation:** <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded on a Bruker AMX 300 spectrometer at 300.1 MHz and 75.2 MHz, respectively. Inductive Coupled Plasma (ICP) measurements were performed on a Perkin Optima 3000 XL ICP instrument. Samples were first dried under vacuum at 65 °C and then digested using 6 ml of HCl and 2ml of HNO<sub>3</sub> and heated at 220 °C for 51 min. GC analysis was performed using an Interscience GC- 8000 gas chromatograph with a fused silica chiral capillary column (DBEXm, permethylated β-cyclodextrin doped into 14% cyanopropylphenyl / 86% dimethyl polysiloxane, 30 m × 0.25 mm × 0.25 mm ). GC conditions: isotherm at 80 °C (5 min); ramp at 5 °C/ min to 150 (5 min); ramp at 15 °C/ min to 220 min (15 min). Pentadecane was used as internal standard. All products are known compounds and were identified by comparison of their GC retention times to those of authentic samples and by MS analysis. Chemicals were purchased from commercial firms (>99% pure).

**Procedure for preparing the bilayer porous membrane cup:** A porous α-alumina tube of 10 mm outer diameter, 1.5 mm wall thickness, and with an average pore size of 80-120 nm (Pervatech, Netherlands) was coated on the inside with a boehmite sol, following a procedure described elsewhere in more detail.<sup>[1]</sup> The layer was dried in air and then heat-treated at 600°C, so that the boehmite film transformed into a γ-alumina phase with a porosity of ~55% and a pore diameter of 4.5-5 nm. A second layer of boehmite was deposited and transformed into γ-alumina using the same procedure. Then the tube was cut into segments of 2.0 cm length with a circular

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[1] S. R. Chowdhury, P. T. Witte, D. H. A. Blank, P. L. Alsters, J. E. ten Elshof, *Chem. Eur. J.* **2006**, *12* 3061.

diamond saw blade. The cups were prepared from these segments by clamping flat Teflon disks on both sides of the segments.

**SEM analysis:** The thickness and morphology of the  $\gamma$ -alumina layer of the reactors were analyzed by Scanning Electron Microscopy (SEM) using a LEO 1550 FEG SEM. The SEM picture shows the cross section of the inner part of the tube. The  $\gamma$ -alumina layer can be seen to have a total thickness of about 1.2  $\mu\text{m}$ . The top part of the  $\gamma$ -alumina layer is very smooth, relatively dense and featureless, and has a thickness of about 150 nm. The remaining part of the  $\gamma$ - alumina layer has a spherical morphology and some larger macropores are visible in the picture. The semi-permeability of the membrane depends completely on the thin top layer.

