Electronic Supplementary Material (ESI) for Catalysis Science & Technology


# Non-hydrolytic sol-gel route to highly active $MoO_3$-$SiO_2$-$Al_2O_3$ metathesis catalysts

**Damien P. Debecker*[a], Karim Bouchmella[b], Mariana Stoyanova[c], Uwe Rodemerck[c], Eric M. Gaigneaux[a] and P. Hubert Mutin*[b]**

[a] *Institute of Condensed Matter and Nanoscience - MOlecules, Solids and reactiviTy (IMCN / MOST). Université catholique de Louvain. Croix du Sud 2/17, 1348 Louvain-La-Neuve, Belgium. damien.debecker@uclouvain.be ; Tel: 0032 10 47 3665 ; Fax : 0032 10 47 3649*

[b] *Institut Charles Gerhardt, UMR 5253 CNRS-UM2-ENSCM-UM1.Université de Monpellier 2, cc 1701, 34095 Montpellier cedex 5,France.* hubert.mutin@univ-montp2.fr ; Tel : 0033 4 6714 4943; fax: 0033 4 6714 3852

[c] *Leibniz-Institut für Katalyse e.V. an der Universität Rostock, Albert-Einstein-Str. 29a, 18059 Rostock, Germany*

# Supplementary materials

Table S1. Amount of reactants involved in each catalyst preparation

| Catalyst name | $SiCl_4$ (g) | $AlCl_3$ (g) | $MoCl_5$ (g) | $^{i}Pr_2O$ (g) | $CH_2Cl_2$ (ml) |
|---|---|---|---|---|---|
| NH_0_10 | 7.733 | - | 0.572 | 8.258 | 20 |
| NH_5_10a | 7.196 | 0.394 | 0.570 | 8.400 | 20 |
| NH_10_10 | 7.027 | 0.773 | 0.567 | 8.248 | 20 |
| NH_15_10 | 6.309 | 1.178 | 0.572 | 8.258 | 20 |
| NH_20_10 | 5.885 | 1.563 | 0.568 | 8.145 | 20 |
| NH_25_10 | 5.519 | 1.874 | 0.575 | 8.187 | 20 |
| NH_45_10 | 3.860 | 3.548 | 0.565 | 7.914 | 20 |
| NH_65_10 | 2.209 | 5.101 | 0.569 | 7.710 | 20 |
| NH_80_10 | 0.926 | 6.311 | 0.570 | 7.710 | 20 |
| NH_90_10 | - | 7.062 | 0.571 | 7.454 | 20 |
| NH_5_5 | 5.858 | 0.278 | 0.188 | 6.677 | 14 |
| NH_5_10b | 4.499 | 0.263 | 0.384 | 6.347 | 14 |
| NH_5_15 | 4.793 | 0.245 | 0.568 | 5.885 | 14 |
| NH_5_20 | 4.280 | 0.230 | 0.751 | 5.719 | 14 |

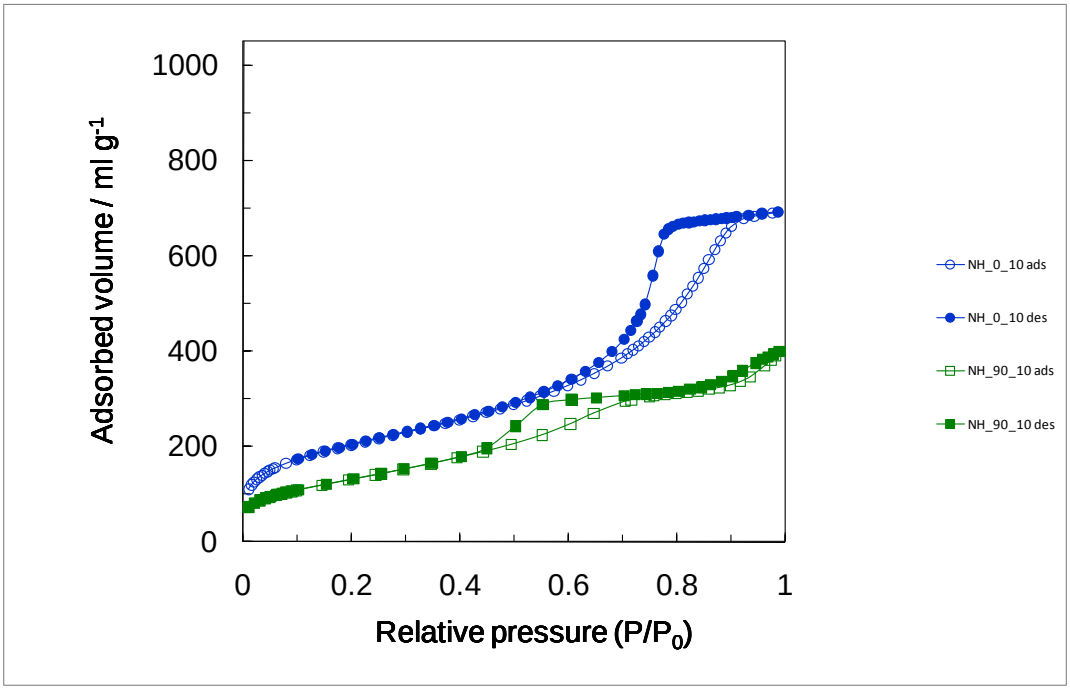


**Figure S1.** $N_2$ adsorption and desorption isotherms for binary catalysts (NH_0_10 and NH_90_10). Both samples are mesorporous.

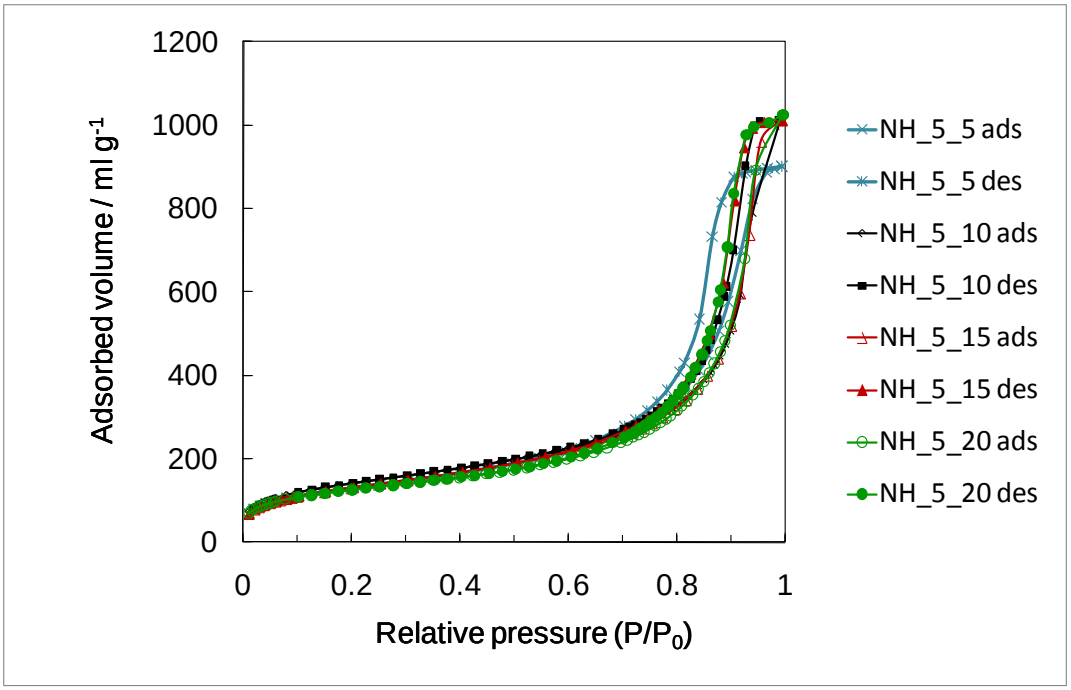


**Figure S2.** $N_2$ adsorption and desorption isotherms for catalysts with different $MoO_3$ content. The $MoO_3$ loading (between 5 and 20 wt. %) does not affect significantly the texture.

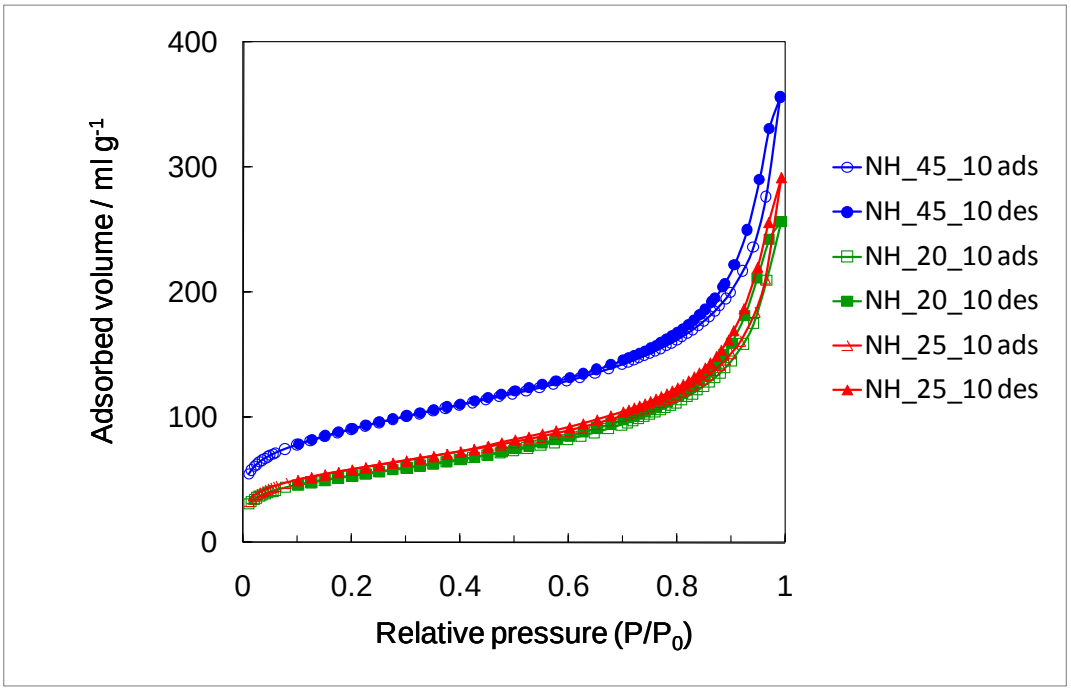


**Figure S3.** $N_2$ adsorption and desorption isotherms for NH_Y_10 catalysts that are not sketched in Fig. 1. When the alumina content is between 15 and 45 wt. %, the texture is very similar.

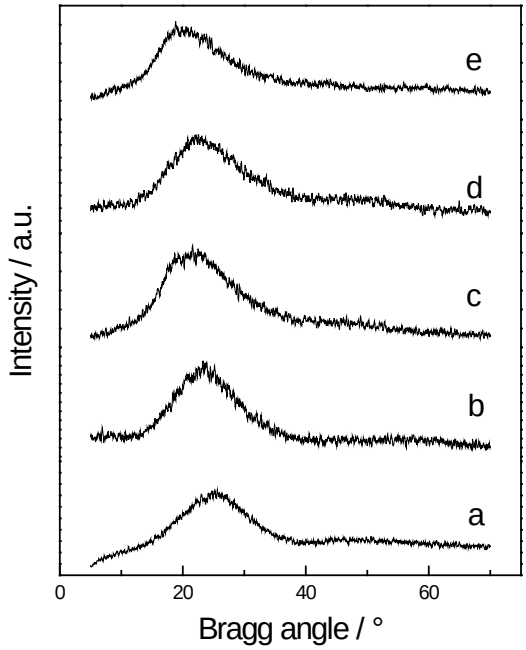


**Figure S4.** XRD diffractograms of (a) NH_0_10, (b) NH_5_10a, (c) NH_10_10, (d) NH_15_10 and (e) NH_20_10. The other samples present similar patterns (see also Debecker et al. Chem Mater 2009).

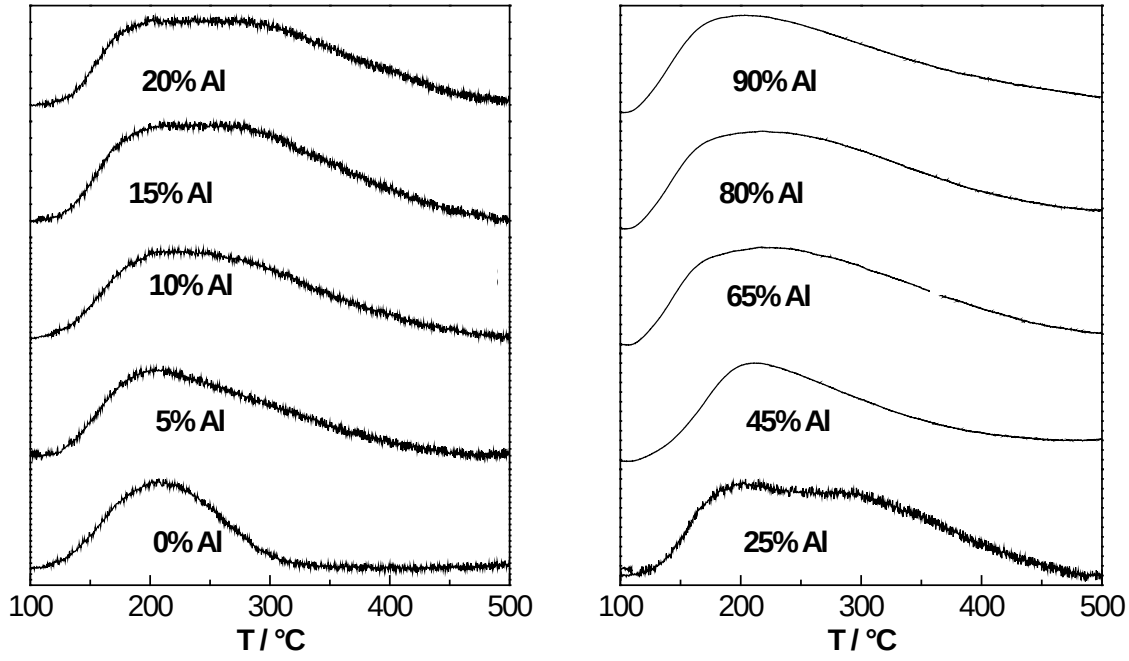


**Figure S5**. $NH_3$-TPD thermograms obtained from the different catalysts with different Al content.