Electronic Supplementary Information

Effect of support on selectivity and on-stream stability of surface VO_x species in non-oxidative propane dehydrogenation

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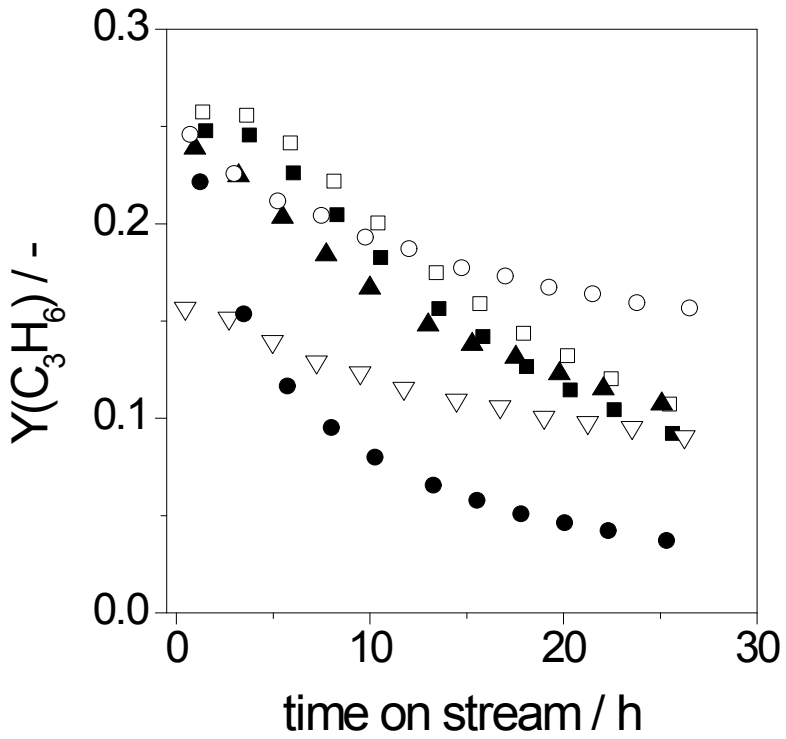

Fig. S 1 Propene yield with time on stream in 27-h dehydrogenation test: VO_x/MCM-41 (ᘓ), VO_x/S1 (O), VO_x/S10 (O), VO_x/S40 (□), VO_x/S70 (♦), and VO_x/Al_2O_3 (ᘐ). Reaction conditions: 550 °C, C_3H_8/N_2 = 40/60, GHSV = 1200 $Lh^{-1}kg^{-1}$.

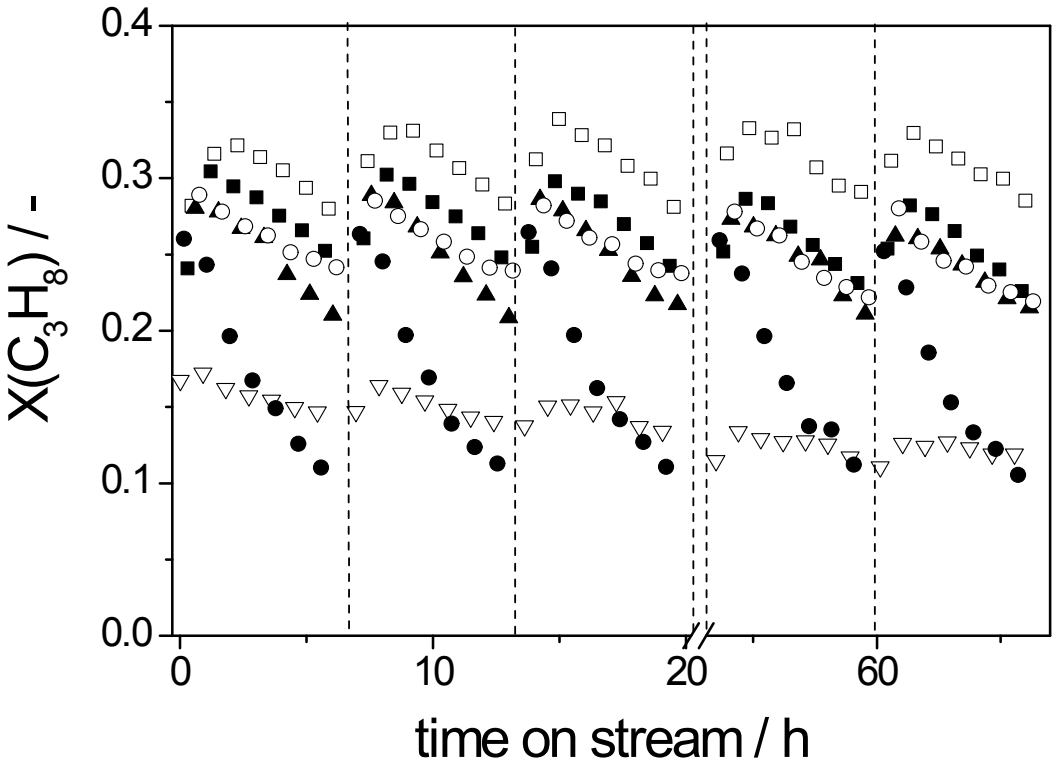

Fig. S 2 Propane conversion in the first three and the last two DH/regeneration cycles from a series of 10 cycles on: VO_x/MCM-41 (ᘓ), VO_x/S1 (O), VO_x/S10 (O), VO_x/S40 (□), VO_x/S70 (♦), and VO_x/Al_2O_3 (ᘐ). Reaction conditions: 550 °C, C_3H_8/N_2 = 40/60, GHSV = 1200 $Lh^{-1}kg^{-1}$.

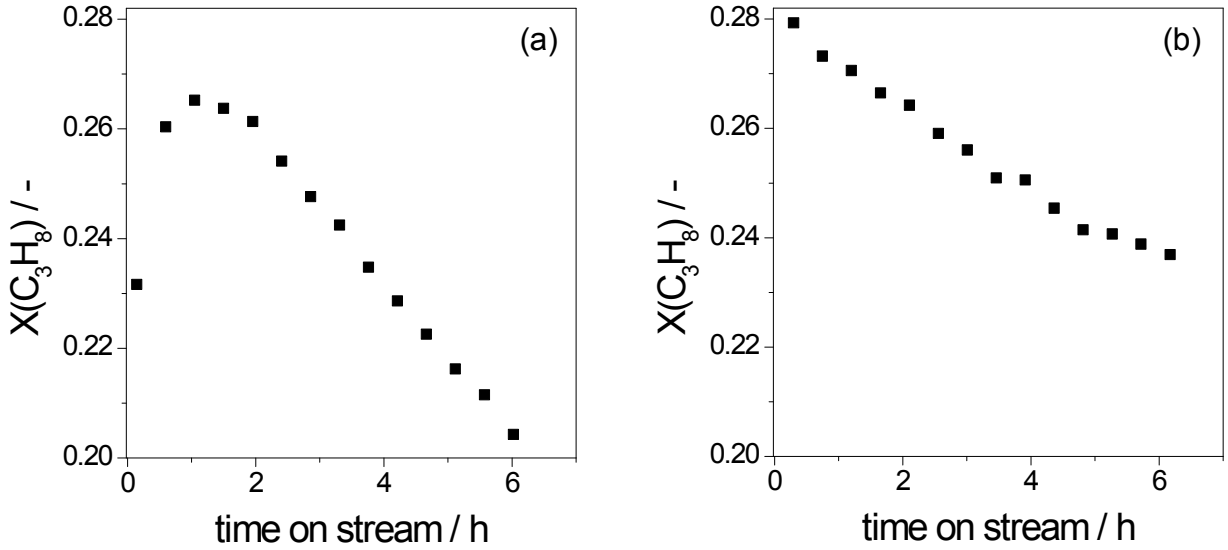

Fig. S 3 Conversion of propane with time on stream over VO_x/S40 (a) and VO_x/MCM-41 (b) during 6-h DH test (sampling was done every 27 min). Reaction conditions: 550 °C, C_3H_8/N_2 = 40/60, GHSV = 1200 $Lh^{-1}kg^{-1}$.

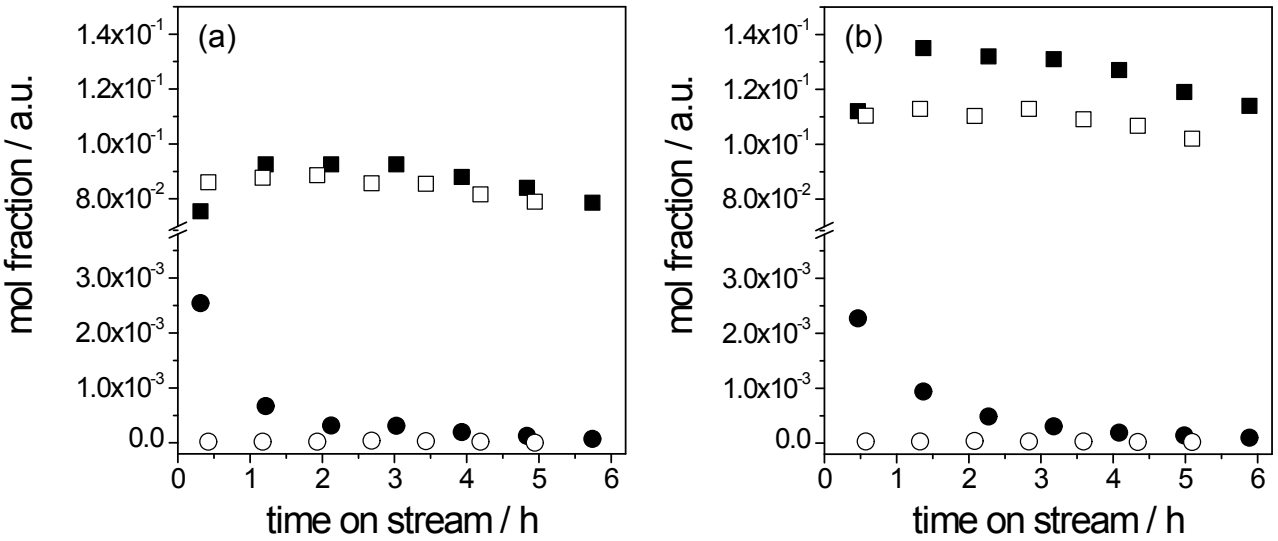

Fig. S 4 Molar fractions of H_2 (O, O) and CO_x (ꝏ, ꝏ) formed over oxidized (closed symbols) and reduced (open symbols) VO_x/S1 (a) and VO_x/S10 (b) during 6-h DH test. Reaction conditions: 550 °C, C_3H_8/N_2 = 40/60, GHSV = 1200 $Lh^{-1}kg^{-1}$.

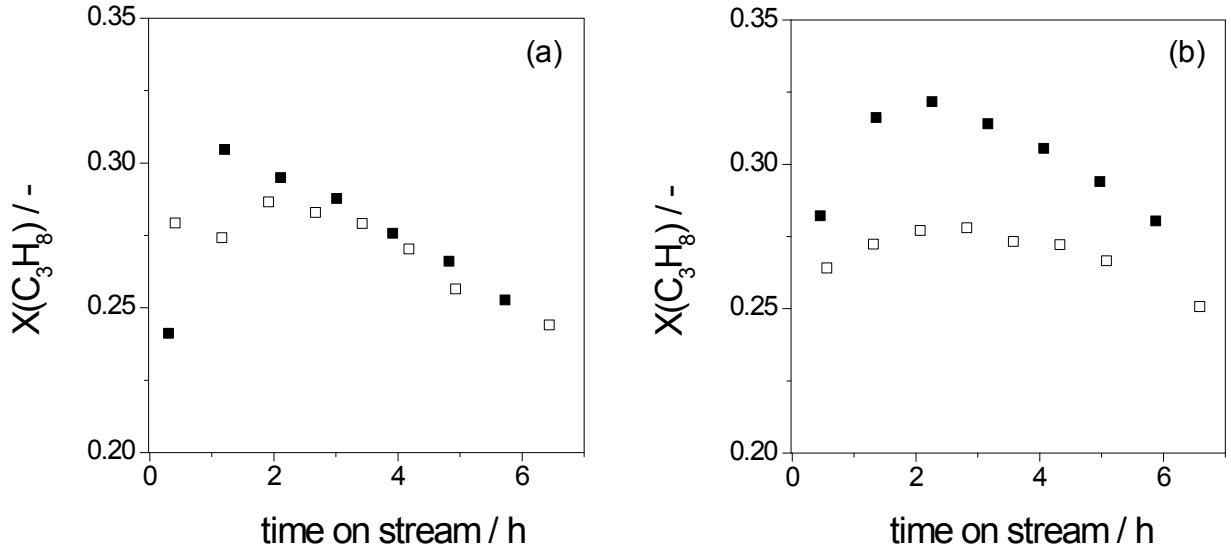

Fig. S 5 Conversion of propane with time on stream on oxidized (O) and reduced (O) VO_x/S1 (a) and VO_x/S10 (b). Reaction conditions: 550 °C, C_3H_8/N_2 = 40/60, GHSV = 1200 $Lh^{-1}kg^{-1}$.