

Supporting Information

Self-adaptive structure and catalytic performance of the Pt-Sn/Al₂O₃ propane dehydrogenation catalyst regenerated by dichloroethane oxychlorination

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Table S1 The binding energy of Pt 4d_{5/2}, relative contents of Pt species determined by XPS measurements.

Samples	Bind Energy(eV) Pt 4d _{5/2}		
	metallic Pt	Oxidized Pt(II)	Oxidized Pt(IV)
Fresh-0Sn	312.2 (29.7%) ^a	315.2 (49.1%)	317.3 (21.2%)
Fresh-0.03Sn	312.9 (17.8%)	314.5 (48.8%)	316.9 (33.4%)
Fresh-0.13Sn	311.3 (29.7%)	314.4 (45.4%)	317.0 (24.9%)
Fresh-0.54Sn	312.7 (35.1%)	315.2 (38.1%)	317.1 (26.8%)
Sinter-0Sn	313.2 (26.0%)	315.8 (35.2%)	318.4 (38.7%)
Sinter-0.03Sn	312.2 (23.6%)	314.9 (51.2%)	316.9 (25.2%)
Sinter-0.13Sn	313.0 (25.5%)	315.6 (47.7%)	317.2 (26.8%)
Sinter-0.54Sn	313.2 (16.9%)	315.3 (32.1%)	317.4 (51.0%)
Re-0Sn	312.1 (20.9%)	314.3 (59.2%)	316.3 (19.9%)
Re-0.03Sn	313.0 (25.2%)	315.3 (42.9%)	317.3 (31.9%)
Re-0.13Sn	312.1 (21.4%)	315.0 (52.5%)	317.5 (26.1%)
Re-0.54Sn	312.1 (22.8%)	315.1 (57.8%)	316.4 (19.4%)

^a The percentage of peak area.

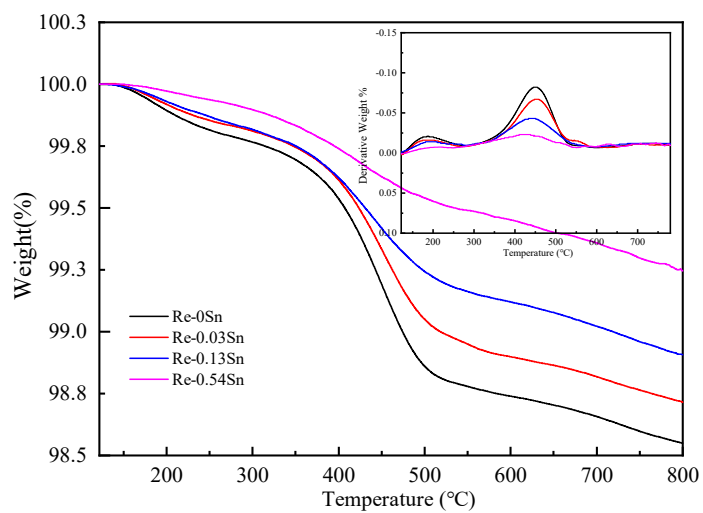
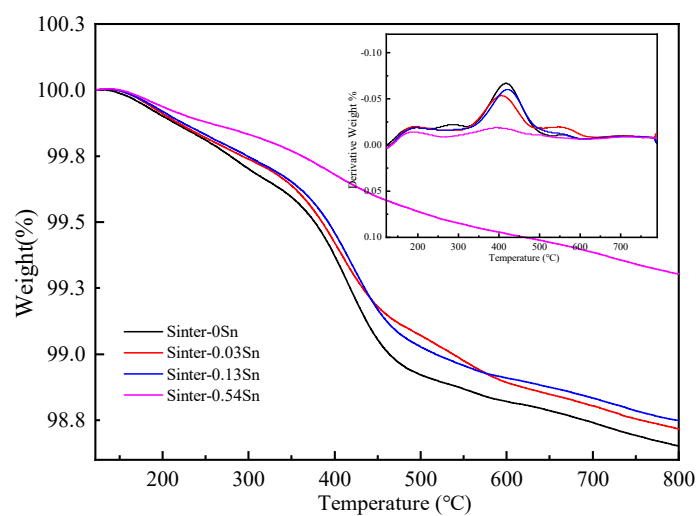
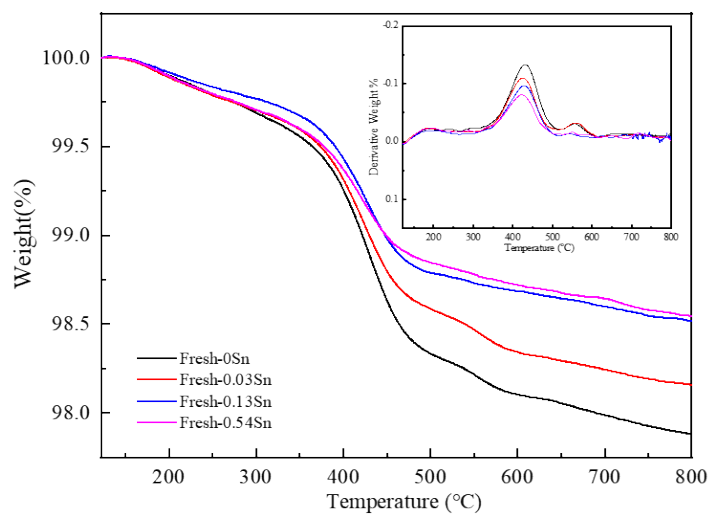


Figure S1 TG and DTG curves of fresh, sintered and regenerate catalysts.

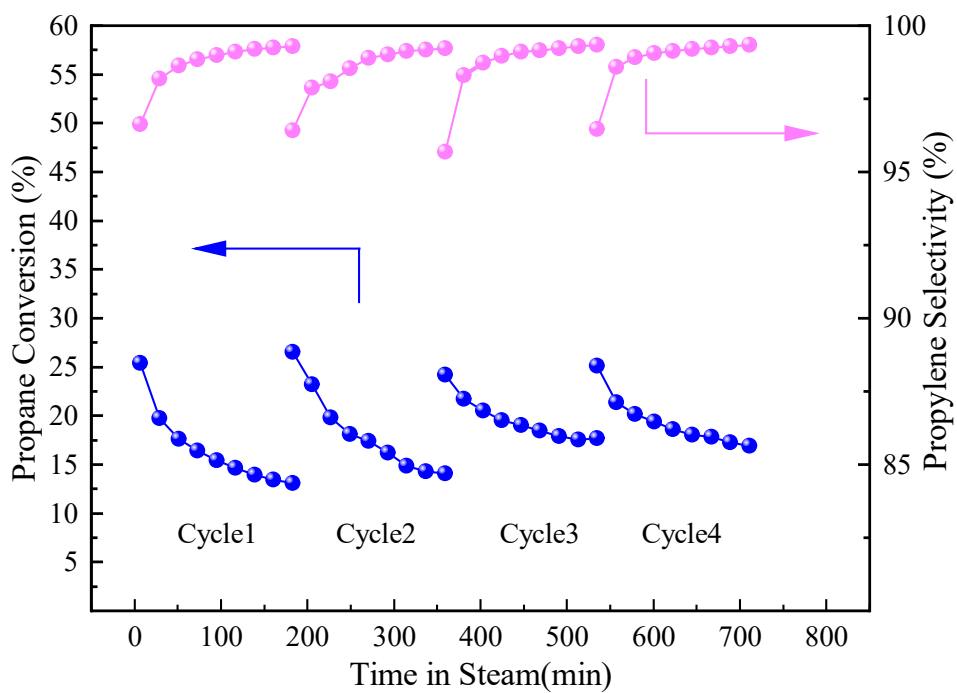


Fig S2 Evaluation catalytic propane dehydrogenation performance of Re-0.03/Al₂O₃ in reaction-calcination- oxychlorination cycles.

Table S2 The content of Cl on different samples

sample	Cl content (wt%)
Fresh-0.13Sn	1.05
Fresh-0.54Sn	1.11
Sinter-0.13Sn	1.09
Sinter-0.54Sn	0.98
Re-0.54Sn	1.07