

Supporting Information for

Deactivation Mechanism and Regeneration Study of Ga-Pt Promoted HZSM-5 Catalyst in Ethane Dehydroaromatization

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Table S1. Performance statistics of hydrogen production of Ga-Pt/ZSM-5.

Regenerated by 10 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-6.0%
1st Regeneration	-28.5%	-23.4%	-13.0%	-10.6%	17.4%
2nd Regeneration	-3.5%	-3.9%	-4.7%	-4.8%	15.9%
3rd Regeneration	-3.9%	-4.6%	-4.2%	-3.7%	16.1%
4th Regeneration	-6.5%	-5.4%	-6.3%	-1.6%	22.2%

Regenerated by 2 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-5.8%
1st Regeneration	-16.4%	-8.3%	-3.9%	1.1%	13.9%
2nd Regeneration	-2.6%	-3.5%	-2.0%	-2.3%	14.3%
3rd Regeneration	-5.4%	-5.1%	-5.3%	-5.0%	14.8%
4th Regeneration	-4.9%	-4.5%	-3.8%	-4.0%	15.9%

Table S2. Performance statistics of benzene production of Ga-Pt/ZSM-5.

Regenerated by 10 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-17.7%
1st Regeneration	10.4%	9.8%	8.7%	5.8%	-21.1%
2nd Regeneration	-8.2%	-8.0%	-7.3%	-6.6%	-19.8%
3rd Regeneration	-7.0%	-7.2%	-6.5%	-6.4%	-19.2%
4th Regeneration	-8.4%	-7.4%	-8.1%	-8.2%	-19.0%

Regenerated by 2 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-16.3%
1st Regeneration	14.2%	15.1%	10.8%	13.2%	-17.0%
2nd Regeneration	-3.1%	-4.2%	-4.1%	-2.0%	-16.1%
3rd Regeneration	-5.5%	-5.6%	-6.2%	-7.2%	-17.6%
4th Regeneration	-5.7%	-5.7%	-6.4%	-4.3%	-16.3%

Table S3. Performance statistics of toluene production of Ga-Pt/ZSM-5.

Regenerated by 10 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-22.2%
1st Regeneration	33.8%	36.6%	40.5%	42.4%	-17.2%
2nd Regeneration	-9.5%	-9.8%	-9.5%	-10.2%	-17.9%
3rd Regeneration	-5.0%	-6.0%	-8.4%	-7.3%	-19.8%
4th Regeneration	-9.1%	-8.2%	-9.6%	-13.0%	-20.8%

Regenerated by 2 vol% O ₂	Performance Change, Compared to Previous Cycle				Percentage Change, Within Single Cycle
Cycles\Time	2.5 min	5 min	10 min	15 min	
Original					-22.6%
1st Regeneration	26.3%	35.4%	37.9%	40.2%	-14.2%
2nd Regeneration	-1.8%	-3.2%	-3.3%	-3.7%	-15.8%
3rd Regeneration	-5.2%	-5.1%	-6.3%	-7.9%	-18.2%
4th Regeneration	-5.6%	-5.9%	-6.9%	-8.2%	-20.4%

