

Supplementary Information

Activity and Deactivation of Ru supported on $\text{La}_{1.6}\text{Sr}_{0.4}\text{NiO}_4$ perovskite-like catalyst prepared by different methods for decomposition of N_2O

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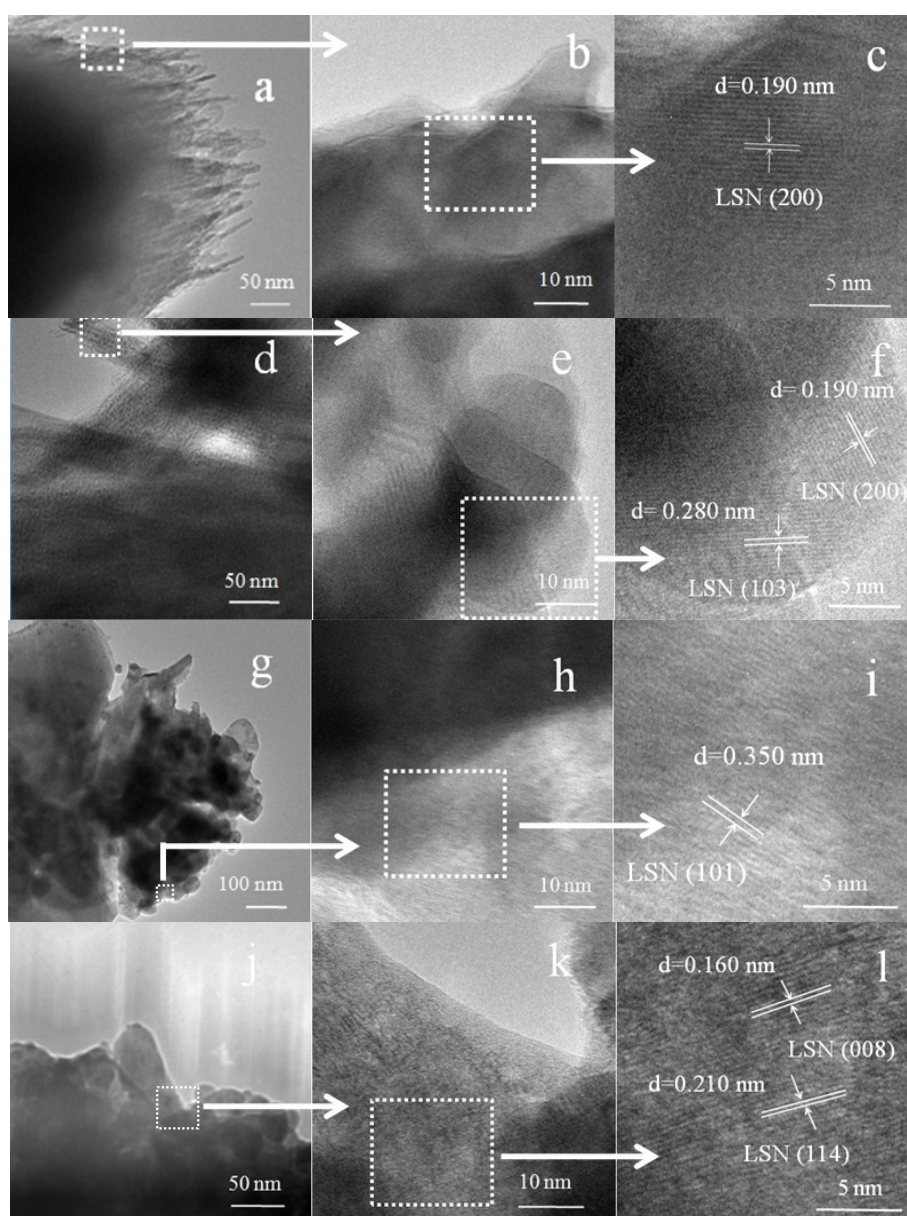


Fig. S1 TEM profiles of (a, b, c, d, e, f) of Ru/LSN and (g, h, i, j, k, l) of Ru/LSN-EG.

Table S1 Conversion of N₂O over different Ru-based catalysts

Catalysts	Ru Content (%)	T _{50%} (°C)	Reaction conditions	GHSV (h ⁻¹)	References
Ru/LSN	0.2	300	1700 ppm N ₂ O, 3%O ₂	14000	In this work
Ru/Al ₂ O ₃	0.95	410	500 ppm N ₂ O, 3%O ₂	56000	13
	2	375	500 ppm N ₂ O	56000	34
		440	500 ppm N ₂ O, 5%O ₂	56000	34
Ru/r-TiO ₂	5	260	30000 ppm N ₂ O	WHSV: 30000 mL/g ⁻¹ h ⁻¹	15
Ru/a-TiO ₂	5	300	30000 ppm N ₂ O	WHSV: 30000 mL/g ⁻¹ h ⁻¹	15
Ru/MgO	0.93	>500	1000 ppm N ₂ O	24000	26
Ru/CeO ₂	0.19	480	1000 ppm N ₂ O	24000	26
Ru/SiO ₂	1.14	350	1000 ppm N ₂ O	24000	26
Ru/FER	0.45	340	1500 ppm N ₂ O, 400ppm NO	60000	65
Ru/MCM-41	0.20	437	3300 ppm N ₂ O	WHSV: 100000 mL/g ⁻¹ h ⁻¹	66
Ru/Beta	0.29	367	3300 ppm N ₂ O	WHSV: 100000 mL/g ⁻¹ h ⁻¹	66
Rh/Al ₂ O ₃	0.5	340	1000 ppm N ₂ O	10000	67
Rh/SiO ₂	0.5	372	1000 ppm N ₂ O	26500	68
Pd/Al ₂ O ₃	0.5	>500	1000 ppm N ₂ O	10000	67
Pd/CeO ₂	0.5	475	1000 ppm N ₂ O	10000	67
Pt/CeO ₂	0.5	460	1000 ppm N ₂ O	10000	67
Pt/Al ₂ O ₃	0.5	>500	1000 ppm N ₂ O	10000	67
Ir/Al ₂ O ₃	5	375	30000 ppm N ₂ O	30000	29

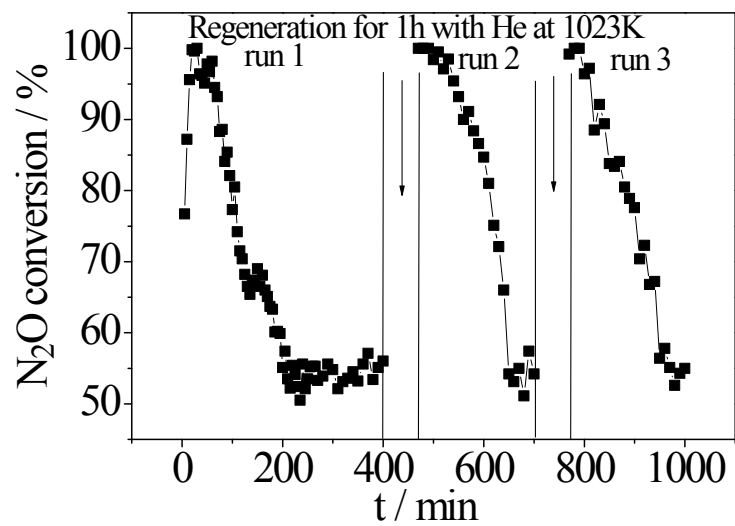


Fig. S2 regeneration experiment of Ru/LSN catalyst after the deactivation.

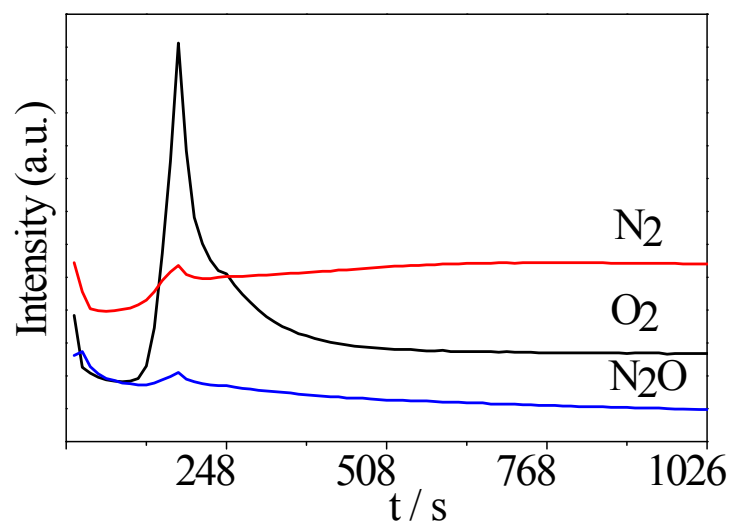


Fig. S3 Online MS curve in the process of heating treatment over Ru/LSN catalyst at 750 °C.