

Table S1 Effects of doped metal on the performance of the HZSM-5(38) based catalysts.

Entry	Catalyst	Conversion (%)	Carbon yield (%)									Yield ^a (%)	Yield ^b (%)	CB (%)
			Pyr	2-Pico	3-Pico	AN	PN	AA	C ₂ H ₄	C ₃ H ₆	CO ₂			
1	HZSM-5(38)	96.1	15.7	1.1	4.5	4.8	2.3	6.7	-	-	6.1	7.1	21.3	41.1
2	9.2%Fe/HZSM-5(38)	99.7	7.1	1.6	2.6	9.5	5.6	4.5	2.2	1.8	18.2	15.1	11.3	52.9
3	9.2%Co/HZSM-5(38)	98.2	12.9	2.9	2.5	12.3	3.0	5.1	3.5	3.5	13.4	15.3	18.3	58.9
4	9.2%Ni/HZSM-5(38)	97.6	15.1	1.8	3.5	10.9	2.5	5.7	2.5	2.8	16.8	13.4	20.4	61.7
5	9.2%Cu/HZSM-5(38)	99.8	22.3	1.0	3.8	4.8	0.9	7.6	2.7	2.1	12.9	5.7	27.1	58.1
6	9.2%Zn/HZSM-5(38)	100.0	8.4	3.3	2.0	11.0	4.3	6.1	3.5	2.9	17.7	15.3	13.7	59.2
7	9.2%Cr/HZSM-5(38)	100.0	11.3	1.2	1.9	13.9	3.8	4.1	3.3	4.3	20.2	17.7	14.4	64.0

Pyr: pyridine; 2-Pico: 2-picoline; 3-Pico: 3-picoline; AN: acetonitrile; PN: propionitrile; AA: acetaldehyde; CB: carbon balance.

Reaction conditions: reaction temperature 500°C, ammonia/glycerol molar ratio 3:1, atmospheric pressure, GHSV 300 h⁻¹, time on stream 2–4 h. 20 wt% glycerol aqueous solution 0.06 ml/min, NH₃ 9.2 ml/min.

^a Total carbon yield of acetonitrile and propionitrile.

^b Total carbon yield of pyridine, 2-picoline and 3-picoline.