

**Supporting information**

**Analysis of n-hexane, 1-hexene, cyclohexane and cyclohexene catalytic cracking over HZSM-5 zeolites: Effects of molecular structure**

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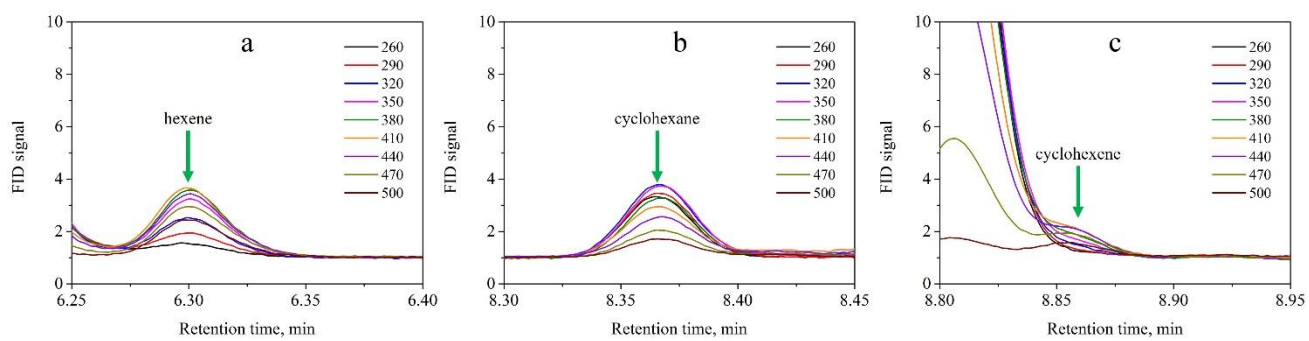


Figure S1 Chromatograms for the detection of (a) hexene (RT=6.30 min), (b) cyclohexane (RT=8.37 min), and (c) cyclohexene (RT=8.86 min) in n-hexane catalytic cracking.

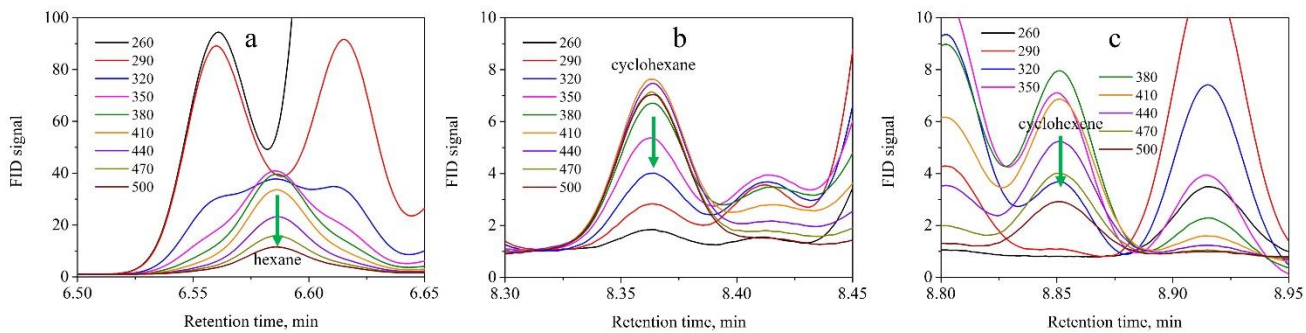


Figure S2 Chromatograms for the detection of (a) hexane (RT=6.58 min), (b) cyclohexane (RT=8.37 min), and (c) cyclohexene (RT=8.86 min) in 1-hexene catalytic cracking.

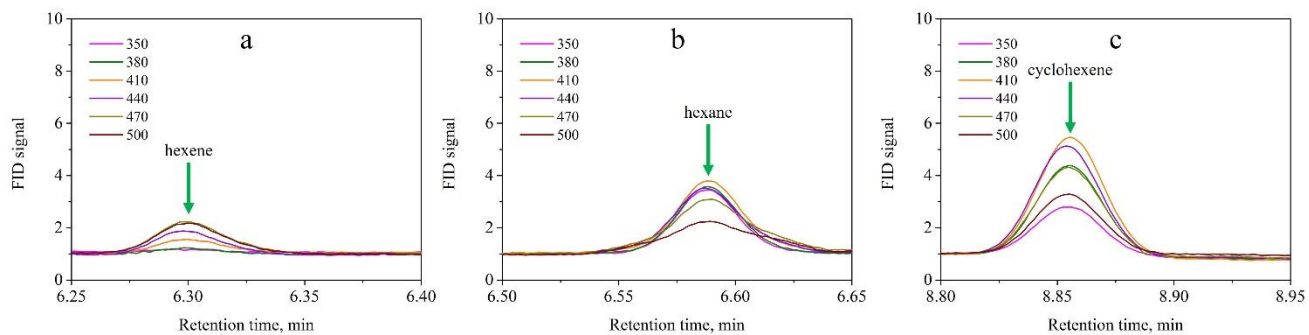


Figure S3 Chromatograms for the detection of (a) hexene (RT=6.30 min), (b) hexane (RT=6.58 min), and (c) cyclohexene (RT=8.86 min) in cyclohexane catalytic cracking.

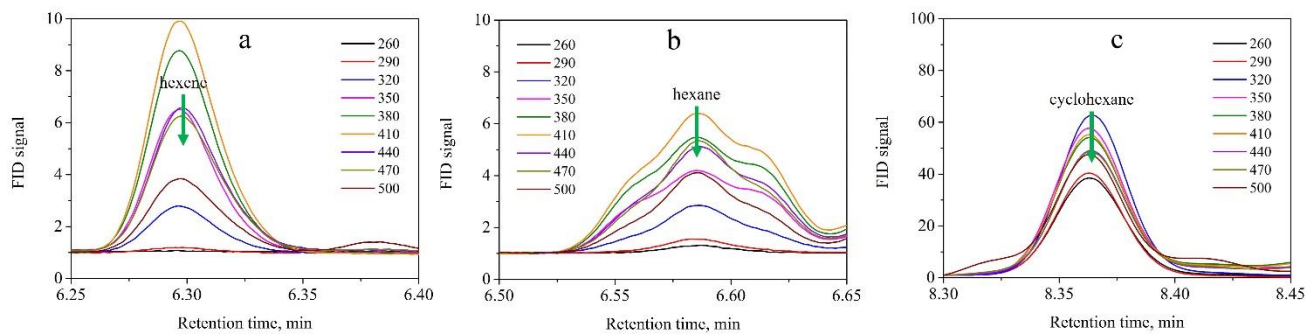


Figure S4 Chromatograms for the detection of (a) hexene (RT=6.30 min), (b) hexane (RT=6.58 min), and (c) cyclohexane (RT=8.37 min) in cyclohexene catalytic cracking.

Table S1 Effects of reaction temperature on the product selectivity (wt%) in n-hexane catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	3.8	9.2	10.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
290	0.0	0.0	13.0	13.2	11.7	9.3	0.0	5.6	0.0	0.0	5.5	0.0	0.0	0.0	0.0
320	0.0	0.0	19.0	16.5	12.1	9.0	0.0	7.5	0.0	2.4	5.7	0.0	0.0	0.0	0.0
350	0.0	0.0	24.7	16.6	10.6	6.6	2.9	9.6	1.1	4.4	5.6	0.0	0.0	0.0	0.5
380	0.0	1.0	29.9	15.0	9.1	4.2	4.5	11.5	1.1	4.4	5.1	0.0	1.0	0.0	1.4
410	0.0	1.8	33.6	12.8	7.9	2.6	6.2	13.3	1.1	4.2	4.5	0.0	1.7	0.0	1.9
440	0.5	3.1	34.5	10.2	6.6	1.5	8.1	14.9	1.1	4.0	4.1	0.5	2.5	0.0	2.4
470	1.0	5.1	32.3	7.7	5.4	0.8	10.6	16.4	1.0	3.7	3.6	0.9	4.0	0.0	3.5
500	1.8	7.0	28.0	5.8	4.6	0.4	13.4	17.2	1.0	3.3	3.0	1.9	6.4	0.0	4.0

Table S2 Effects of reaction temperature on the product yield (wt%) in n-hexane catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	0.1	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
290	0.0	0.0	0.7	0.7	0.7	0.5	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0
320	0.0	0.0	2.2	1.9	1.4	1.0	0.0	0.9	0.0	0.3	0.7	0.0	0.0	0.0	0.0
350	0.0	0.0	5.1	3.5	2.2	1.4	0.6	2.0	0.2	0.9	1.2	0.0	0.0	0.0	0.1
380	0.0	0.3	10.9	5.4	3.3	1.5	1.6	4.2	0.4	1.6	1.9	0.0	0.4	0.0	0.5
410	0.0	0.9	17.8	6.8	4.2	1.4	3.3	7.0	0.6	2.2	2.4	0.0	0.9	0.0	1.0
440	0.3	2.1	23.3	6.9	4.4	1.0	5.5	10.1	0.7	2.7	2.7	0.3	1.7	0.0	1.6
470	0.8	4.0	25.6	6.1	4.3	0.6	8.4	12.9	0.8	2.9	2.8	0.7	3.1	0.0	2.7
500	1.6	6.2	24.7	5.1	4.0	0.4	11.8	15.1	0.8	2.9	2.7	1.7	5.6	0.0	3.5

Table S3 Effects of time on stream on the product selectivity (wt%) in n-hexane catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	4.4	7.2	18.1	3.3	2.1	0.0	17.0	15.8	0.7	2.3	2.0	8.6	12.4	0.5	5.2
1	4.0	7.4	18.0	3.3	2.1	0.0	18.0	17.0	0.8	2.4	2.1	7.9	11.2	0.5	4.7
1.5	4.0	7.4	17.5	3.2	2.1	0.0	18.5	17.6	0.8	2.5	2.2	7.9	11.0	0.4	4.5
2	4.0	7.4	17.6	3.3	2.1	0.0	18.5	17.8	0.8	2.5	2.2	7.7	10.8	0.5	4.5
2.5	4.0	7.4	17.3	3.2	2.0	0.0	18.7	18.1	0.8	2.6	2.2	7.7	10.6	0.4	4.4
3	3.9	7.5	17.4	3.3	2.0	0.0	18.7	18.3	0.8	2.6	2.3	7.5	10.5	0.4	4.3
3.5	3.9	7.5	17.3	3.3	2.0	0.0	18.8	18.6	0.9	2.7	2.3	7.4	10.3	0.4	4.2
4	3.8	7.5	17.4	3.3	2.0	0.0	18.8	18.8	0.9	2.7	2.3	7.2	10.1	0.4	4.2
4.5	3.8	7.6	17.3	3.4	2.1	0.0	18.9	19.2	0.9	2.8	2.4	7.0	9.9	0.4	4.1
5	3.7	7.6	17.2	3.4	2.1	0.0	19.0	19.5	0.9	2.8	2.4	6.9	9.7	0.4	4.0
5.5	3.7	7.6	17.3	3.4	2.1	0.0	19.0	19.7	0.9	2.9	2.5	6.7	9.5	0.4	3.9
6	3.6	7.6	17.4	3.5	2.1	0.0	18.9	19.8	1.0	2.9	2.5	6.6	9.4	0.4	3.9



Table S4 Effects of time on stream on the product yield (wt%) in n-hexane catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	4.4	7.1	17.8	3.2	2.0	0.0	16.7	15.5	0.7	2.2	1.9	8.5	12.1	0.5	5.1
1	3.9	7.2	17.6	3.2	2.1	0.0	17.6	16.7	0.7	2.4	2.1	7.7	11.0	0.4	4.6
1.5	3.9	7.2	17.1	3.1	2.0	0.0	18.1	17.2	0.8	2.4	2.1	7.7	10.7	0.4	4.4
2	3.9	7.3	17.1	3.2	2.0	0.0	18.0	17.4	0.8	2.5	2.1	7.6	10.6	0.4	4.4
2.5	3.9	7.3	16.9	3.2	2.0	0.0	18.3	17.7	0.8	2.5	2.2	7.5	10.4	0.4	4.3
3	3.8	7.3	16.9	3.2	2.0	0.0	18.2	17.8	0.8	2.6	2.2	7.3	10.2	0.4	4.2
3.5	3.8	7.3	16.8	3.2	2.0	0.0	18.2	18.0	0.8	2.6	2.2	7.2	10.0	0.4	4.1
4	3.7	7.3	16.8	3.2	2.0	0.0	18.2	18.2	0.8	2.7	2.3	7.0	9.8	0.4	4.0
4.5	3.7	7.3	16.7	3.3	2.0	0.0	18.3	18.5	0.9	2.7	2.3	6.8	9.5	0.4	3.9
5	3.6	7.3	16.6	3.3	2.0	0.0	18.3	18.8	0.9	2.7	2.4	6.6	9.3	0.4	3.8
5.5	3.5	7.3	16.6	3.3	2.0	0.0	18.2	18.9	0.9	2.8	2.4	6.5	9.1	0.4	3.8
6	3.5	7.3	16.7	3.3	2.1	0.0	18.1	19.0	0.9	2.8	2.4	6.3	9.0	0.4	3.7

Table S5 Effects of reaction temperature on the product selectivity (wt%) in 1-hexene catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.5	0.0	0.0	0.0	0.0	0.0
290	0.0	0.0	0.0	0.0	0.4	0.3	0.0	6.1	4.3	6.9	1.5	0.8	0.5	0.0	0.0
320	0.0	0.0	0.7	0.6	1.9	1.4	0.5	12.3	6.9	15.7	2.8	0.9	0.3	0.0	0.8
350	0.0	0.0	1.4	1.2	4.5	2.8	1.7	16.9	7.1	15.0	3.2	1.1	0.3	0.0	1.7
380	0.0	0.0	2.6	1.9	6.6	3.4	3.6	19.9	6.3	12.5	3.0	1.2	1.5	0.5	3.1
410	0.0	0.0	4.3	2.6	7.7	3.3	6.4	22.4	5.5	10.3	2.8	1.3	2.8	0.8	5.0
440	0.0	0.0	6.2	2.9	7.3	2.5	9.9	24.6	4.8	8.6	2.5	1.4	4.3	1.0	6.1
470	0.3	0.3	7.1	2.7	5.7	1.6	13.8	27.7	4.4	7.5	2.4	1.5	5.4	0.8	6.3
500	0.6	0.4	6.3	1.9	3.7	0.8	17.7	31.8	4.3	6.9	2.4	1.8	6.1	0.6	5.4

Table S6 Effects of reaction temperature on the product yield (wt%) in 1-hexene catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.4	0.0	0.0	0.0	0.0	0.0
290	0.0	0.0	0.0	0.0	0.4	0.3	0.0	5.8	4.0	6.5	1.4	0.8	0.4	0.0	0.0
320	0.0	0.0	0.6	0.6	1.9	1.4	0.5	12.1	6.8	15.5	2.7	0.9	0.3	0.0	0.7
350	0.0	0.0	1.4	1.2	4.4	2.7	1.6	16.7	7.0	14.9	3.1	1.1	0.3	0.0	1.7
380	0.0	0.0	2.6	1.9	6.6	3.4	3.6	19.9	6.3	12.5	3.0	1.2	1.5	0.5	3.1
410	0.0	0.0	4.3	2.6	7.7	3.2	6.4	22.3	5.5	10.3	2.7	1.3	2.8	0.8	5.0
440	0.0	0.0	6.2	2.9	7.3	2.5	9.9	24.6	4.8	8.6	2.5	1.4	4.3	1.0	6.1
470	0.3	0.3	7.1	2.7	5.7	1.6	13.8	27.7	4.4	7.5	2.4	1.5	5.4	0.8	6.3
500	0.6	0.4	6.3	1.9	3.7	0.8	17.7	31.8	4.3	6.9	2.4	1.8	6.1	0.6	5.4

Table S7 Effects of time on stream on the product selectivity (wt%) in 1-hexene catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	3.3	1.1	7.5	1.4	2.2	0.0	18.7	15.9	1.3	2.0	0.7	13.0	20.5	0.8	9.1
1	3.1	1.0	6.9	1.3	2.0	0.0	19.8	17.0	1.4	2.1	0.8	12.9	19.2	0.8	9.0
1.5	3.0	1.0	6.6	1.2	1.9	0.0	20.3	17.8	1.5	2.2	0.8	12.8	18.9	0.8	8.7
2	3.0	1.0	6.8	1.3	2.1	0.0	20.7	18.8	1.6	2.4	0.9	12.3	18.1	0.7	7.8
2.5	2.8	0.9	6.2	1.2	1.9	0.0	21.2	19.6	1.6	2.5	0.9	11.9	17.7	0.8	8.2
3	2.7	0.9	6.2	1.2	2.1	0.0	21.6	20.7	1.8	2.7	1.0	11.4	16.7	0.7	7.8
3.5	2.6	0.8	6.1	1.2	2.1	0.0	21.7	21.5	1.8	2.8	1.1	10.9	16.5	0.7	7.6
4	2.5	0.8	6.1	1.2	2.2	0.0	21.8	22.3	1.9	3.0	1.2	10.3	15.6	0.7	7.2
4.5	2.4	0.8	5.9	1.2	2.2	0.0	22.1	23.3	2.0	3.1	1.2	9.7	14.8	0.7	7.1
5	2.2	0.7	5.5	1.1	2.1	0.0	22.1	24.1	2.1	3.2	1.3	9.6	15.1	0.7	7.2
5.5	2.2	0.7	5.7	1.2	2.2	0.0	22.2	24.9	2.3	3.4	1.4	9.0	14.0	0.6	6.6
6	2.0	0.6	5.2	1.1	2.0	0.0	22.1	25.7	2.3	3.5	1.4	8.9	14.1	0.6	6.7

Table S8 Effects of time on stream on the product yield (wt%) in 1-hexene catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	3.3	1.1	7.5	1.4	2.2	0.0	18.7	15.9	1.3	2.0	0.7	13.0	20.5	0.8	9.1
1	3.1	1.0	6.9	1.3	2.0	0.0	19.8	17.0	1.4	2.1	0.8	12.9	19.2	0.8	9.0
1.5	3.0	1.0	6.6	1.2	1.9	0.0	20.3	17.8	1.5	2.2	0.8	12.8	18.9	0.8	8.7
2	3.0	1.0	6.8	1.3	2.1	0.0	20.7	18.8	1.6	2.4	0.9	12.3	18.1	0.7	7.8
2.5	2.8	0.9	6.2	1.2	1.9	0.0	21.2	19.6	1.6	2.5	0.9	11.9	17.7	0.8	8.2
3	2.7	0.9	6.2	1.2	2.1	0.0	21.6	20.7	1.8	2.7	1.0	11.4	16.7	0.7	7.8
3.5	2.6	0.8	6.1	1.2	2.1	0.0	21.7	21.5	1.8	2.8	1.1	10.9	16.5	0.7	7.6
4	2.5	0.8	6.1	1.2	2.2	0.0	21.8	22.3	1.9	3.0	1.2	10.3	15.6	0.7	7.2
4.5	2.4	0.8	5.9	1.2	2.2	0.0	22.1	23.3	2.0	3.1	1.2	9.7	14.8	0.7	7.1
5	2.2	0.7	5.5	1.1	2.1	0.0	22.1	24.1	2.1	3.2	1.3	9.6	15.1	0.7	7.2
5.5	2.2	0.7	5.7	1.2	2.2	0.0	22.2	24.9	2.3	3.4	1.4	9.0	14.0	0.6	6.6
6	2.0	0.6	5.2	1.1	2.0	0.0	22.1	25.7	2.3	3.5	1.4	8.9	14.1	0.6	6.7

Table S9 Effects of reaction temperature on the product selectivity (wt%) in cyclohexane catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
290	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
350	0.0	0.0	31.4	12.5	0.0	0.0	6.6	0.0	0.0	0.0	0.0	6.5	10.8	0.0	21.4
380	0.0	0.0	28.1	9.7	2.5	1.8	6.3	6.6	0.0	0.0	2.9	5.6	10.6	3.1	15.7
410	0.0	0.0	27.3	7.9	2.5	1.2	7.0	8.8	0.7	2.8	3.1	4.3	11.3	2.3	13.9
440	0.0	0.0	25.9	6.3	2.6	0.7	8.5	11.5	0.9	3.2	3.3	4.1	12.4	1.7	13.6
470	0.4	0.5	22.6	4.6	2.6	0.4	10.7	14.2	1.0	3.4	3.3	4.4	13.5	1.1	12.7
500	0.7	0.6	17.2	2.9	2.6	0.0	13.9	17.4	1.0	3.5	3.2	5.7	15.3	0.8	11.8

Table S10 Effects of reaction temperature on the product yield (wt%) in cyclohexane catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
290	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
350	0.0	0.0	1.2	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.8
380	0.0	0.0	3.8	1.3	0.3	0.2	0.8	0.9	0.0	0.0	0.4	0.7	1.4	0.4	2.1
410	0.0	0.0	8.4	2.4	0.8	0.4	2.1	2.7	0.2	0.9	1.0	1.3	3.5	0.7	4.3
440	0.0	0.0	13.5	3.3	1.4	0.4	4.4	6.0	0.5	1.7	1.7	2.1	6.5	0.9	7.1
470	0.2	0.3	15.6	3.2	1.8	0.3	7.4	9.8	0.7	2.3	2.3	3.0	9.3	0.8	8.8
500	0.6	0.5	13.6	2.3	2.0	0.0	10.9	13.7	0.8	2.7	2.5	4.5	12.1	0.6	9.3

Table S11 Effects of time on stream on the product selectivity (wt%) in cyclohexane catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	2.1	0.6	9.4	1.3	1.9	0.0	14.5	14.1	0.6	2.0	1.7	19.2	19.7	1.0	10.0
1	1.8	0.5	8.3	1.2	1.9	0.0	15.3	15.9	0.7	2.2	1.9	20.0	18.2	1.0	9.3
1.5	1.7	0.5	7.6	1.1	1.9	0.0	15.6	17.3	0.8	2.4	2.1	20.6	16.9	1.0	9.0
2	1.6	0.4	7.0	1.0	1.8	0.0	15.5	18.3	0.8	2.6	2.3	21.1	16.2	1.0	8.6
2.5	1.6	0.4	6.8	1.0	1.8	0.0	15.6	19.6	0.9	2.8	2.4	20.8	15.5	0.9	8.3
3	1.5	0.4	6.6	1.0	1.8	0.0	15.5	20.7	1.0	3.1	2.6	20.5	14.7	0.9	8.0
3.5	1.4	0.3	6.3	0.9	1.8	0.0	15.3	21.9	1.1	3.3	2.8	20.2	14.2	0.9	8.0
4	1.3	0.3	6.0	0.9	1.7	0.0	15.0	23.4	1.2	3.5	3.1	20.0	13.5	0.9	7.9
4.5	1.3	0.0	5.7	0.8	1.6	0.0	14.8	24.8	1.3	3.7	3.3	19.9	12.8	0.8	7.7
5	1.2	0.0	5.6	0.8	1.5	0.0	14.4	25.8	1.4	4.0	3.4	19.9	12.0	0.8	7.3
5.5	1.2	0.0	5.5	0.8	1.4	0.0	14.1	26.8	1.4	4.1	3.6	19.6	11.6	0.8	7.2
6	1.1	0.0	5.0	0.7	1.3	0.0	13.6	28.2	1.5	4.3	3.8	20.0	10.5	0.8	7.4



Table S12 Effects of time on stream on the product yield (wt%) in cyclohexane catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	2.0	0.6	8.9	1.2	1.8	0.0	13.8	13.4	0.6	1.9	1.6	18.3	18.7	0.9	9.5
1	1.7	0.5	7.7	1.1	1.8	0.0	14.3	14.8	0.6	2.1	1.8	18.7	17.0	0.9	8.7
1.5	1.6	0.4	6.9	1.0	1.7	0.0	14.3	15.8	0.7	2.2	1.9	18.8	15.5	0.9	8.2
2	1.5	0.4	6.3	0.9	1.6	0.0	13.9	16.4	0.7	2.3	2.0	18.9	14.5	0.9	7.7
2.5	1.4	0.3	5.9	0.8	1.6	0.0	13.5	17.0	0.8	2.5	2.1	18.1	13.5	0.8	7.2
3	1.3	0.3	5.5	0.8	1.5	0.0	13.0	17.4	0.8	2.6	2.2	17.2	12.3	0.8	6.7
3.5	1.1	0.3	5.1	0.7	1.4	0.0	12.3	17.7	0.9	2.6	2.3	16.3	11.4	0.7	6.4
4	1.0	0.2	4.6	0.7	1.3	0.0	11.6	18.0	0.9	2.7	2.4	15.4	10.4	0.7	6.1
4.5	0.9	0.0	4.2	0.6	1.2	0.0	10.8	18.2	0.9	2.7	2.4	14.6	9.4	0.6	5.6
5	0.8	0.0	3.9	0.6	1.0	0.0	10.0	17.9	0.9	2.7	2.4	13.8	8.3	0.6	5.1
5.5	0.8	0.0	3.6	0.5	0.9	0.0	9.2	17.4	0.9	2.7	2.4	12.7	7.5	0.5	4.7
6	0.7	0.0	3.1	0.4	0.8	0.0	8.4	17.3	0.9	2.6	2.3	12.3	6.5	0.5	4.5

Table S13 Effects of reaction temperature on the product selectivity (wt%) in cyclohexene catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.8	0.0	0.0	0.0
290	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	78.6	0.4	0.0	0.8
320	0.0	0.0	0.4	0.0	0.0	0.0	1.2	1.7	0.6	0.6	0.2	60.5	1.8	0.7	3.3
350	0.0	0.0	1.2	0.6	0.8	0.6	5.6	8.3	2.5	3.8	1.2	20.9	4.9	1.9	8.6
380	0.0	0.0	1.3	0.7	1.3	1.0	4.6	11.0	3.3	6.2	1.6	7.0	8.2	3.1	11.7
410	0.0	0.0	1.0	0.4	0.9	0.6	4.1	10.6	2.5	4.6	1.3	5.0	10.0	3.8	14.1
440	0.0	0.0	1.0	0.4	0.8	0.5	5.4	13.5	2.7	4.7	1.4	4.4	11.6	4.1	15.9
470	0.1	0.0	1.4	0.3	0.7	0.3	10.8	19.4	3.2	5.4	1.8	5.3	11.0	3.3	13.0
500	0.1	0.0	0.6	0.1	0.2	0.0	7.2	18.0	2.8	5.0	2.0	10.7	9.0	2.7	11.2

Table S14 Effects of reaction temperature on the product yield (wt%) in cyclohexene catalytic cracking over HZSM-5 zeolites.

T, °C	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.6	0.0	0.0	0.0
290	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	70.4	0.4	0.0	0.7
320	0.0	0.0	0.3	0.0	0.0	0.0	1.2	1.6	0.6	0.5	0.1	56.4	1.7	0.7	3.1
350	0.0	0.0	1.2	0.5	0.8	0.6	5.5	8.1	2.4	3.8	1.2	20.4	4.8	1.9	8.4
380	0.0	0.0	1.3	0.7	1.3	1.0	4.5	10.9	3.2	6.2	1.6	7.0	8.1	3.0	11.6
410	0.0	0.0	1.0	0.4	0.9	0.6	4.1	10.5	2.5	4.6	1.3	5.0	10.0	3.8	14.1
440	0.0	0.0	1.0	0.4	0.8	0.5	5.4	13.4	2.7	4.7	1.4	4.4	11.6	4.1	15.9
470	0.1	0.0	1.4	0.3	0.7	0.3	10.7	19.3	3.2	5.3	1.8	5.3	10.9	3.3	13.0
500	0.1	0.0	0.6	0.1	0.2	0.0	7.1	17.8	2.7	5.0	2.0	10.5	8.9	2.6	11.1

Table S15 Effects of time on stream on the product selectivity (wt%) in cyclohexene catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	0.5	1.3	0.4	2.9	0.6	1.0	0.0	15.6	13.0	1.0	1.5	0.6	15.0	27.7	0.7
1	1	1.2	0.4	2.3	0.5	0.9	0.0	16.1	14.6	1.2	1.8	0.7	14.6	25.8	0.8
1.5	1.5	1.0	0.3	1.7	0.4	0.8	0.0	16.0	17.2	1.8	2.6	1.0	13.5	23.1	1.0
2	2	0.7	0.0	0.7	0.0	0.3	0.0	11.3	14.2	1.8	2.7	1.2	17.1	17.1	1.6
2.5	2.5	0.4	0.0	0.0	0.0	0.0	0.0	4.5	6.8	1.3	1.8	1.0	33.0	6.3	1.4
3	3	0.3	0.0	0.0	0.0	0.0	0.0	2.1	3.1	0.7	0.9	0.6	44.1	1.7	0.5
3.5	3.5	0.2	0.0	0.0	0.0	0.0	0.0	1.5	2.1	0.5	0.6	0.4	49.5	1.2	0.3
4	4	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.4	0.4	0.4	0.3	51.8	0.8	0.2
4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.9	0.4	0.5	0.3	51.5	0.7	0.0
5	5	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.0	0.0	0.3	0.0	55.1	0.5	0.0
5.5	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.1	0.0	0.3	0.0	55.7	0.6	0.0
6	6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	55.4	0.5	0.0

Table S16 Effects of time on stream on the product yield (wt%) in cyclohexene catalytic cracking over HZSM-5 zeolites at 550 °C.

TOS, h	Methane	Ethane	Propane	n-Butane	iso-Butane	n-Pentane	Ethene	Propene	1-Butene	2-Butene	iso-Butene	Benzene	Toluene	Ethylbenzene	Xylene
0.5	1.3	0.4	2.9	0.6	1.0	0.0	15.6	13.0	1.0	1.5	0.6	15.0	27.7	0.7	14.8
1	1.2	0.4	2.3	0.5	0.9	0.0	16.1	14.6	1.2	1.8	0.7	14.6	25.8	0.8	14.7
1.5	1.0	0.3	1.7	0.4	0.8	0.0	16.0	17.2	1.8	2.6	1.0	13.5	23.1	1.0	13.6
2	0.7	0.0	0.7	0.0	0.3	0.0	11.2	14.1	1.8	2.7	1.2	17.0	17.0	1.6	12.3
2.5	0.4	0.0	0.0	0.0	0.0	0.0	4.4	6.5	1.2	1.7	0.9	31.9	6.1	1.3	6.2
3	0.3	0.0	0.0	0.0	0.0	0.0	2.0	2.9	0.7	0.9	0.5	42.1	1.6	0.5	2.3
3.5	0.2	0.0	0.0	0.0	0.0	0.0	1.4	2.0	0.4	0.6	0.3	46.8	1.1	0.3	1.3
4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3	0.3	0.4	0.3	49.0	0.7	0.2	0.9
4.5	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.8	0.4	0.5	0.3	48.7	0.7	0.0	0.9
5	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.0	0.3	0.0	51.9	0.5	0.0	0.6
5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.0	0.0	0.3	0.0	52.3	0.6	0.0	0.7
6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	52.1	0.5	0.0	0.6