

Appendix A. Supplementary data

Enhanced Catalytic Hydrogenation of Olefins in Sulfur-rich Naphtha Using Molybdenum Carbide Supported on γ -Al₂O₃ Spheres under Steam Conditions: Simulating the Hot Separator Stream Process

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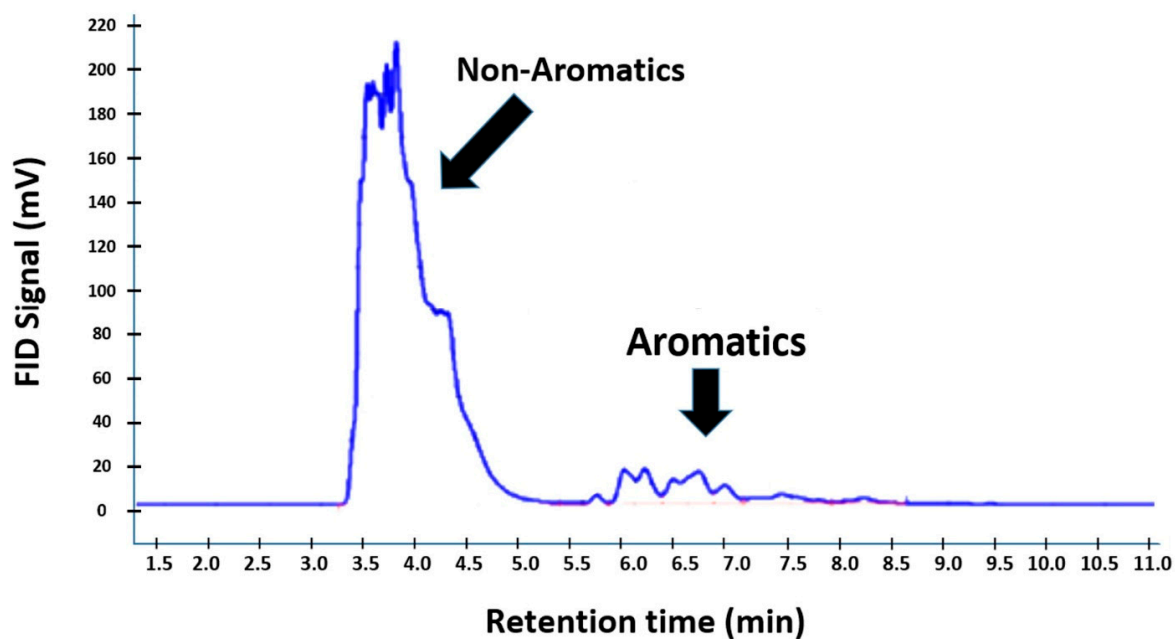


Figure S1. Normalized SFC chromatogram for Nexen naphtha feedstock using ASTM D-5186 method.

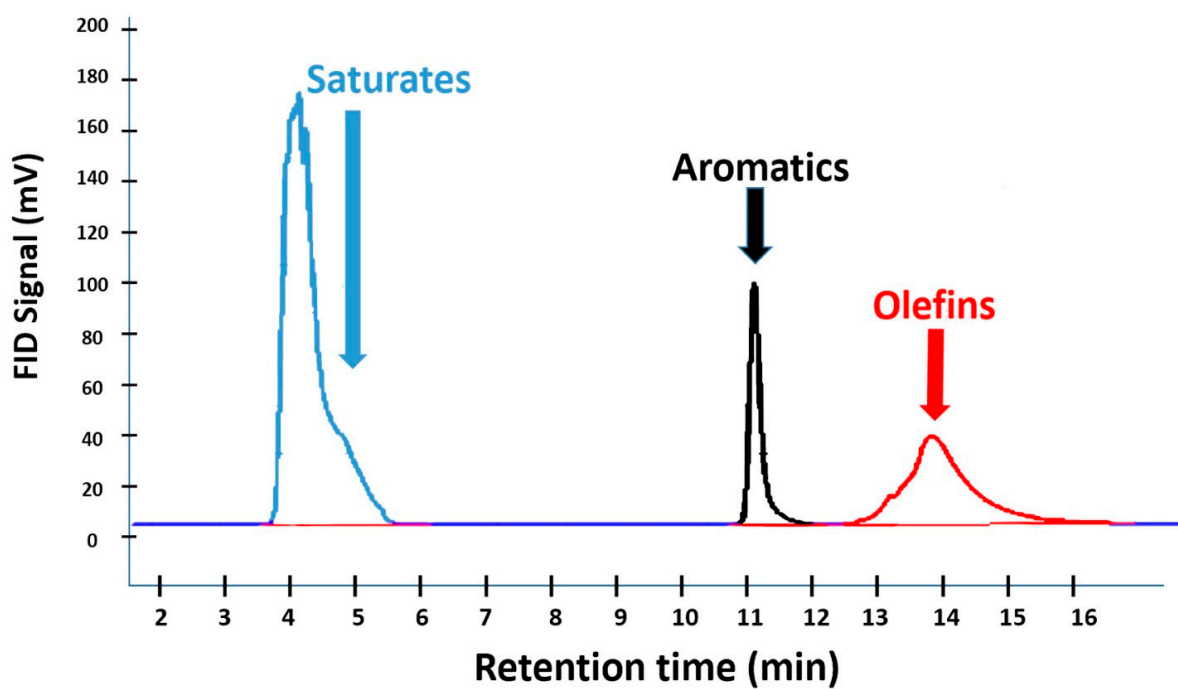


Figure S2. Normalized SFC chromatogram for Nexen naphtha feedstock using ASTM D-6550 method.

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Table S1. Olefinic molecules present in Nexen naphtha, as determined by GC-MS-FID (ASTM D-5134).

2-methyl, 1-propene	2-hexene (Z)	2-heptene (Z)
1-butene (Z)	3-methyl, 2-pentene (E)	1,2,3-trimethyl cyclopentene
2-butene (Z)	2,4-dimethyl-1-pentene	2-ethyl cyclopentene
2-methyl, 1-butene	1-methyl cyclopentene	4-methyl-3-heptene
1-pentene	3-methyl, 1-hexene	1,2,3-trimethyl cyclopentene
2-methyl, 1-butene	2,4-dimethyl-2-pentene	5-methyl-3-heptene
2-pentene (E)	2-methyl-3-hexene	1-methyl cyclohexene
2-pentene (Z)	4-methyl-1-hexene	6-methyl-2-heptene
2-methyl, 2-butene	4-methyl-2-hexene	6-methyl-2-heptene
Cyclopentene	Cyclohexene	2,5-dimethyl -2,4-hexadiene
4-methyl, 1-pentene	4,4-dimethyl-2-pentene	1-Octene
3-methyl, 1-pentene	1-heptene	1,2,3-trimethyl cyclopentene
2,3 dimethyl-butene	3-methyl-3-hexene	4-Octene (E)
2-methyl, 1-pentene	4,4-dimethyl cyclopentene	Methyl-ethyl cyclopentene
1-hexene	3-heptene	3-Octene (E)
3-hexene (E)	2-methyl, 2-hexene	2-Octene (E)
3-hexene (Z)	3-methyl, 3-hexene (E)	1,2,3 trimethyl cyclopentene
2-hexene (E)	2-heptene	2-Octene (Z)
4-methyl, 2-pentene	3,5-dimethyl cyclopentene	2,6-dimethyl-3-heptene
3-methyl, cyclopentene	3-methyl-2-hexene (Z)	1-methyl-thio-1-butene
3-methyl, 2-pentene		2-ethyl cyclohexene
3-methyl cyclopentene		1-ethyl cyclohexene
		2,6-dimethyl-2-heptene
		1-Nonene
		2-Nonene
		3-Nonene
		5-Nonene
		4-Nonene
		4-Decene
		1-methyl-2-decene
		2-methyl-3-decene

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References

- (1) Badoni, R. P.; Bhagat, S. D.; Joshi, G. C. Analysis of olefinic hydrocarbons in cracked petroleum stocks: a review. *Fuel* **1992**, *71*(5), 483-491. [https://doi.org/10.1016/0016-2361\(92\)90144-D](https://doi.org/10.1016/0016-2361(92)90144-D).

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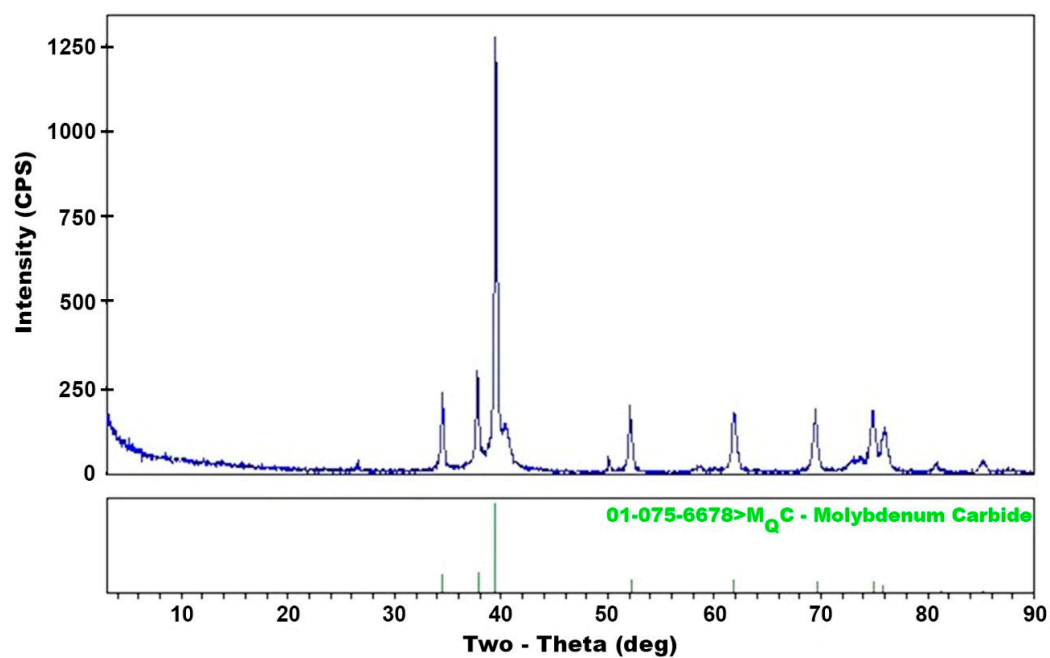


Figure S3. XRD diffractogram for the activated Mo₂C prepared by the sucrose route.