Supplementary Information

Nanostructured carbon material effect on the synthesis of carbon-supported molybdenum carbide catalysts for guaiacol hydrodeoxygenation

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Figure S1. XRD patterns of supports after their corresponding purification and functionalization treatments.

Figure S2. Mo 3d deconvolution of the MoxC/NMC catalysts.
Figure S3. DFT Pore size distributions of catalysts and supports measured by N$_2$ physisorption.
Figure S4. EDX performed to Mo@C/CNT.
Figure S5. EDX performed to MoC/RGO.
Figure S6. EDX performed to MoC/AC.
**Table S1.** Product distribution (wt. %).

|                  | Mo2C/CNF | Mo2C/CNT | Mo2C/RGO | Mo2C/AC |
|------------------|----------|----------|----------|---------|
| Cyclohexane + Benzene | 6.01     | 0.10     | 0.19     | 0.91    |
| Toluene          | 0.00     | 1.28     | 4.61     | 1.44    |
| Anisole          | 3.07     | 0.00     | 0.34     | 2.25    |
| Phenol           | 29.03    | 5.40     | 7.81     | 10.51   |
| Methyl-Cyclohexanol | 0.16   | 0.00     | 0.52     | 1.95    |
| Cresol           | 5.31     | 0.99     | 1.87     | 2.09    |
| Xylenol          | 0.70     | 0.59     | 0.82     | 1.59    |
| Catechol         | 6.64     | 2.70     | 6.08     | 6.68    |
| Others           | 17.02    | 5.66     | 0.76     | 16.28   |

**Table S2.** Selectivity (mol %).

| Catalyst    | Selectivity to Phenol (%) | Selectivity to C+B* (%) | Selectivity to Toluene (%) |
|-------------|---------------------------|-------------------------|----------------------------|
| Mo2C/CNF    | 58.89                     | 13.64                   | 0                          |
| Mo2C/CNT    | 51.52                     | 1.11                    | 12.52                      |
| Mo2C/RGO    | 51.85                     | 1.24                    | 25.78                      |
| Mo2C/AC     | 34.00                     | 3.29                    | 4.75                       |

*Cyclohexane + Benzene

The selectivity was calculated as:

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\text{Selectivity} (\%) = \frac{\text{mol of product}}{\text{mol of guaiacol reacted}} \times 100
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