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Functionalized nanocarbon materials as catalysts for the ethanolysis of furfuryl alcohol

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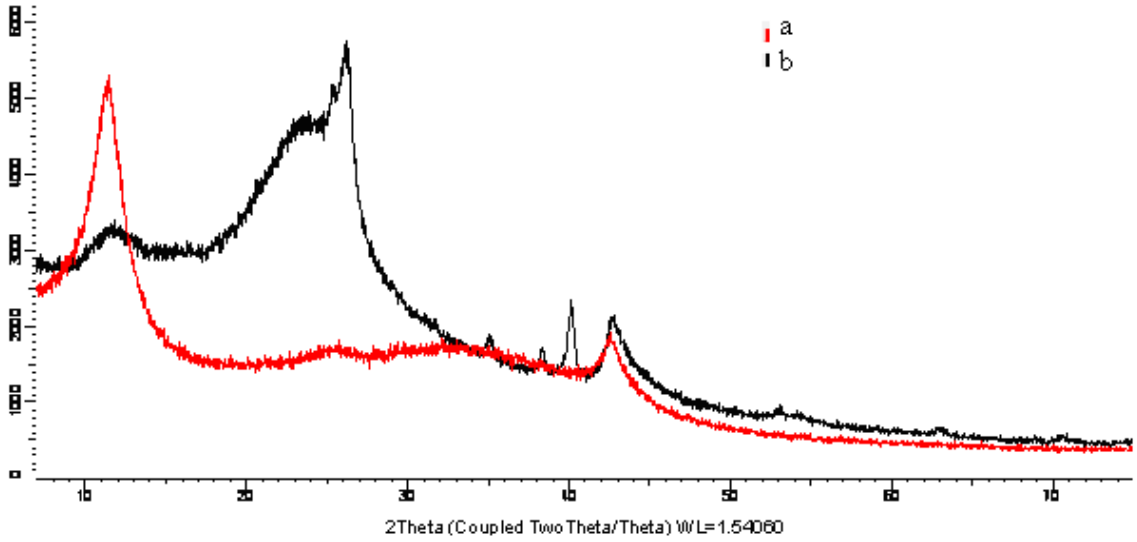

Figure S1 XRD of pattern O-NCM obtained by Hammers's method:
a) with preliminary US-dispersion of the sample
b) without preliminary dispersion of the sample.

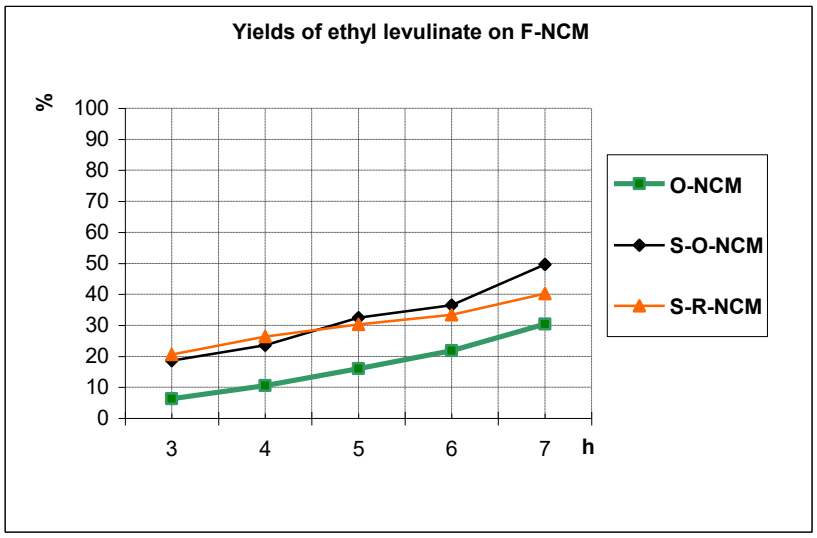

Figure S2 Yields of the products of ethyl levulinate on F-NCM. Conditions: 100°C; ; furfuryl alcohol : Cat = 4 : 1 by weight.

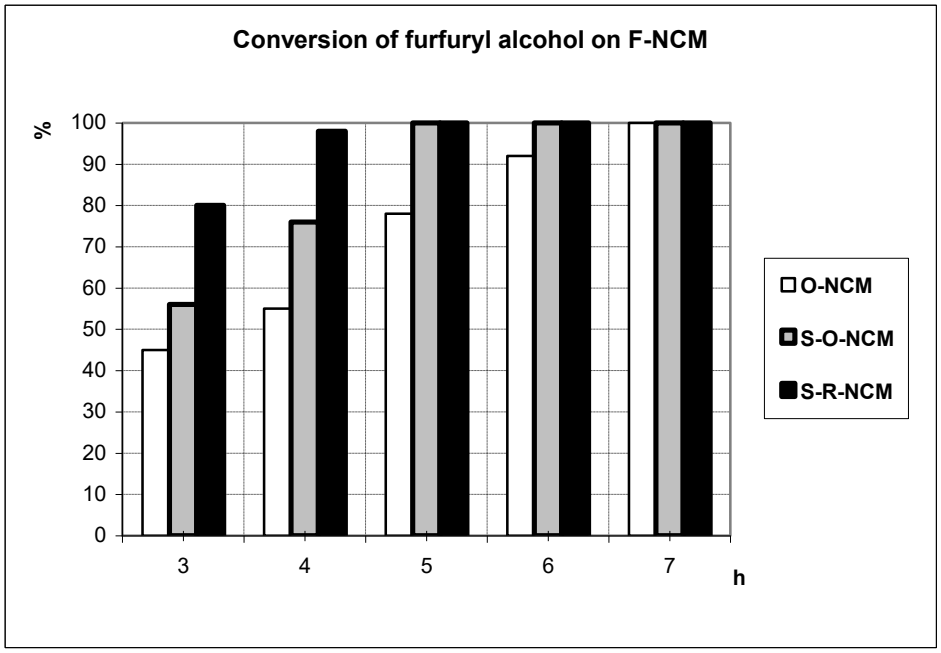

Figure S3 Conversion of furfuryl alcohol on F-NCM. Conditions: 100°C; furfuryl alcohol : Cat = 4 : 1 by weight.

The substances **(2)** and **(5)** **(Sheme 1)** are close in terms of chemical structure, but give completely different mass spectra, thus for the fragmentation of (**2)** there is the peak with the maximum intensity m/z = 43 ($[CH3CO]^+$), and for (**5)** - one with m/z = 103 ($[(EtO)_2CH]^+$). In the second place in intensity for (**2)** the peak m/z = 129 ($[C_7H_{13}O_2]^+$), which occurs when two groups of EtO are separated from M^+, and in the mass spectrum of (**5)** there are two peaks with m/z = 75 ($[C_3H_7O_2]^+$) and m/z = 47 ($[CH_3O_2]^+$). The general property of mass spectra **(2)** and (**5)** is the absence of molecular ions M^+ with m/z = 218. M^+ of substance **(2)** loses Me with the formation of the ion with m/z = 203 and EtO (ion with m/z = 173). The breakdown of the molecular ion of substance **(5)** can be characterized by a disruption of the C_4-C_5 bond, whereas for M^+ of substance **(2)** the principal direction of decomposition is the C3-C4 bond break.

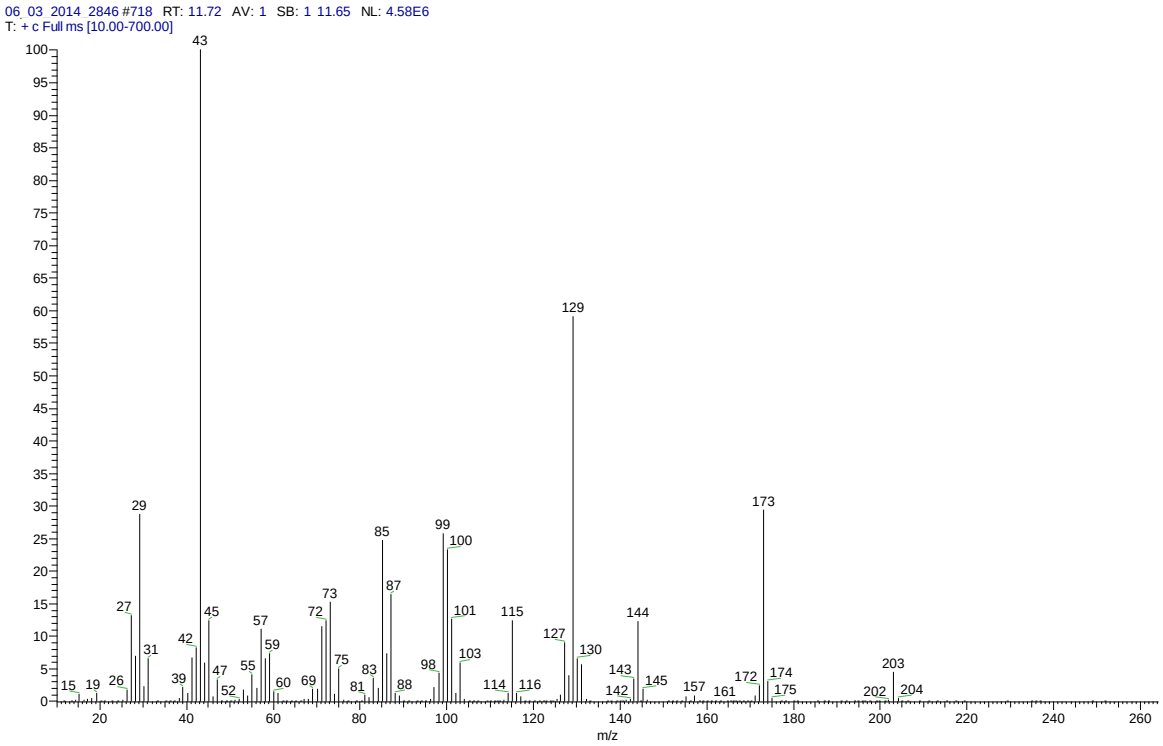

Figure S4 Mass-spectrum of **(2).**

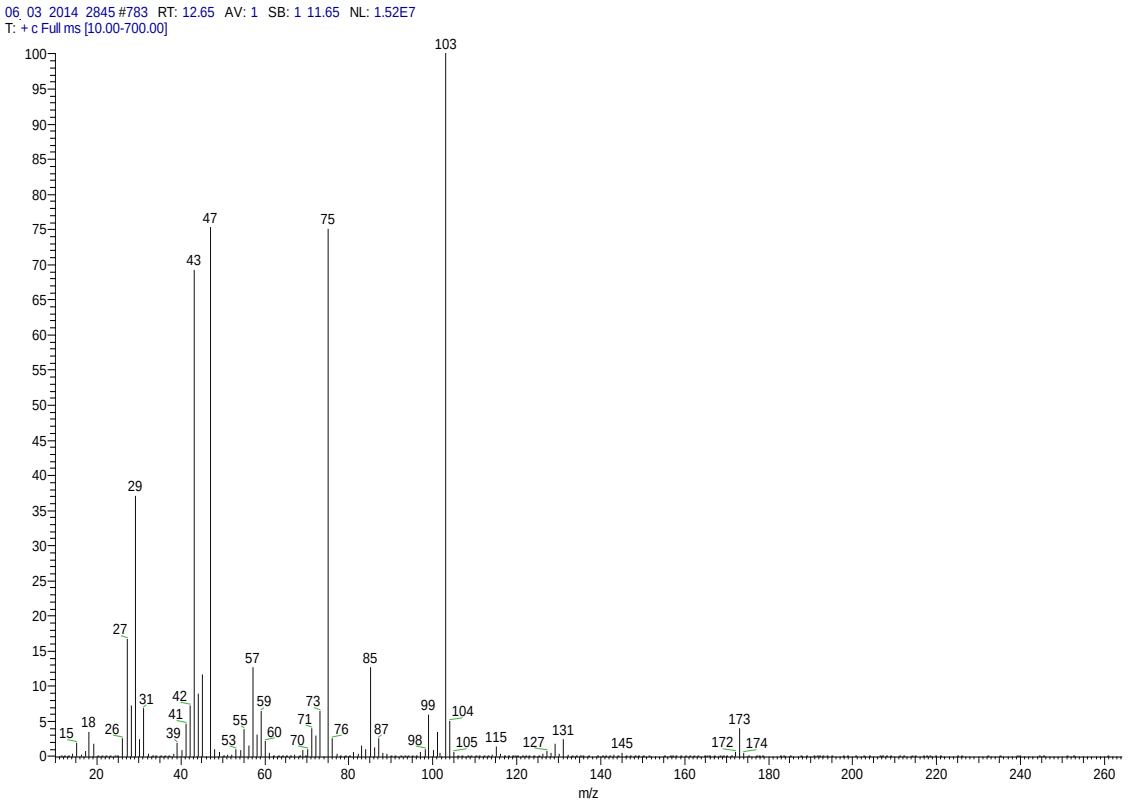

Figure S5 Mass-spectrum of **(5).**