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Supplementary Material

Synthesis, Characterization and Catalytic Activity of UiO-66-NH_2 in the Levulinic Acid Esterification

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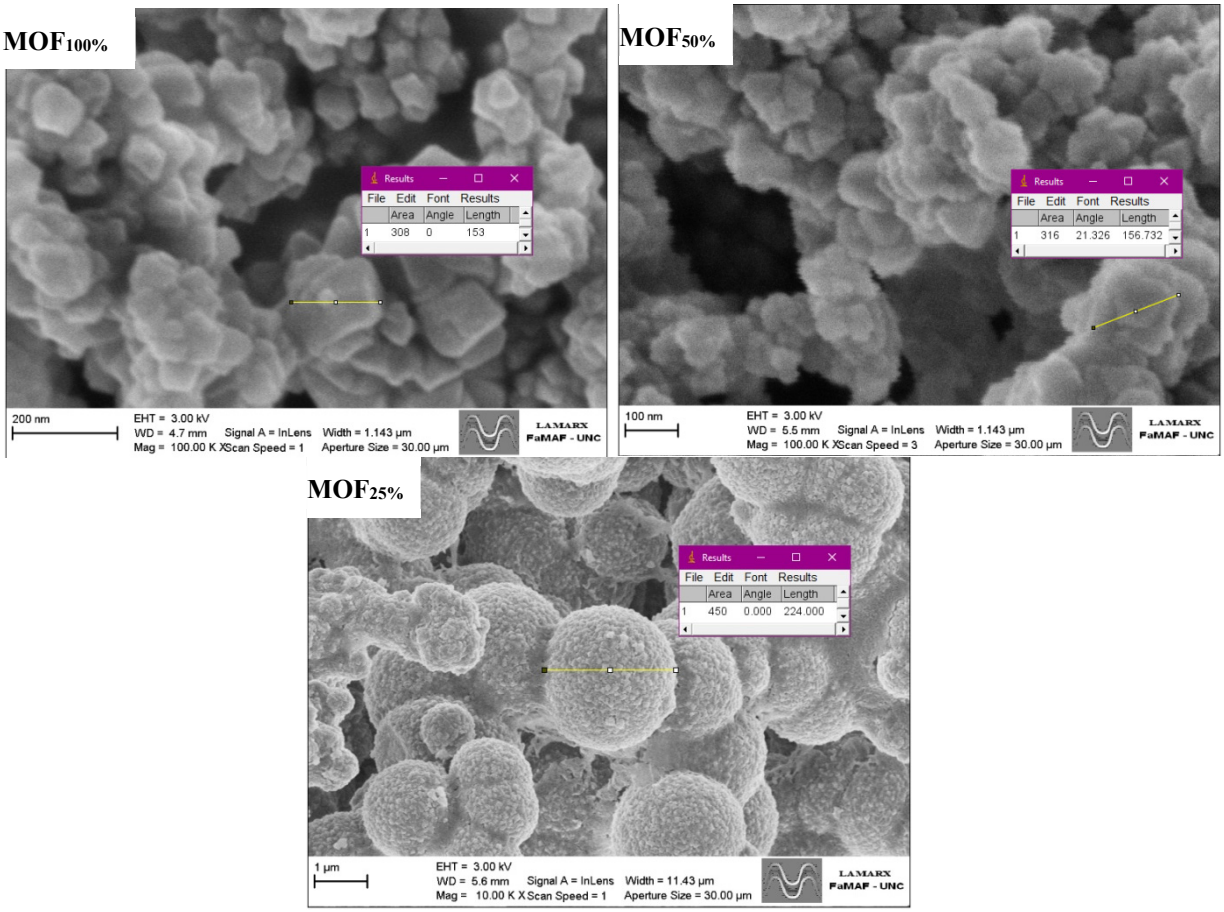

Figure S1. SEM image with average particle size included. $MOF_{100\%}$ (A), $MOF_{50\%}$ (B) and $MOF_{25\%}$ (C).

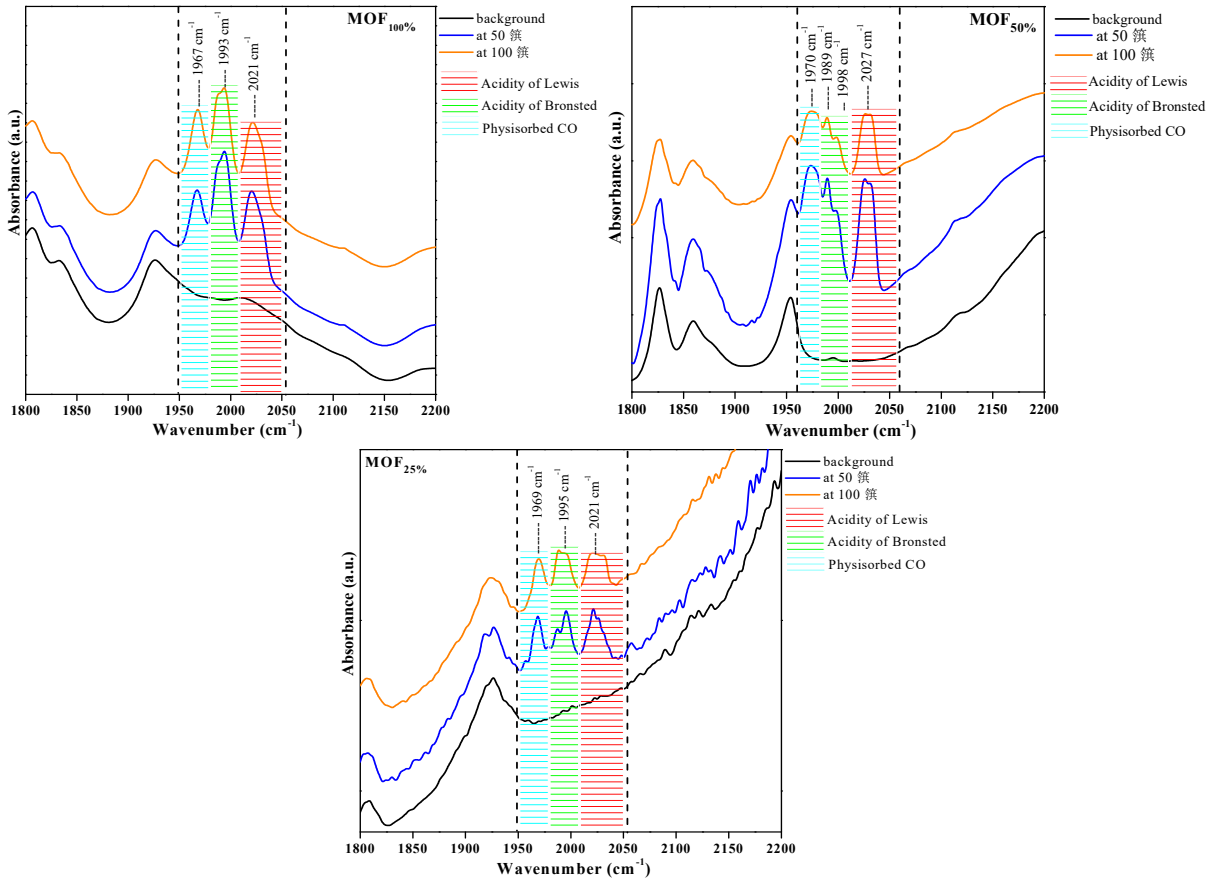

Figure S2. CO-FTIR absorption spectra of synthesized solids.

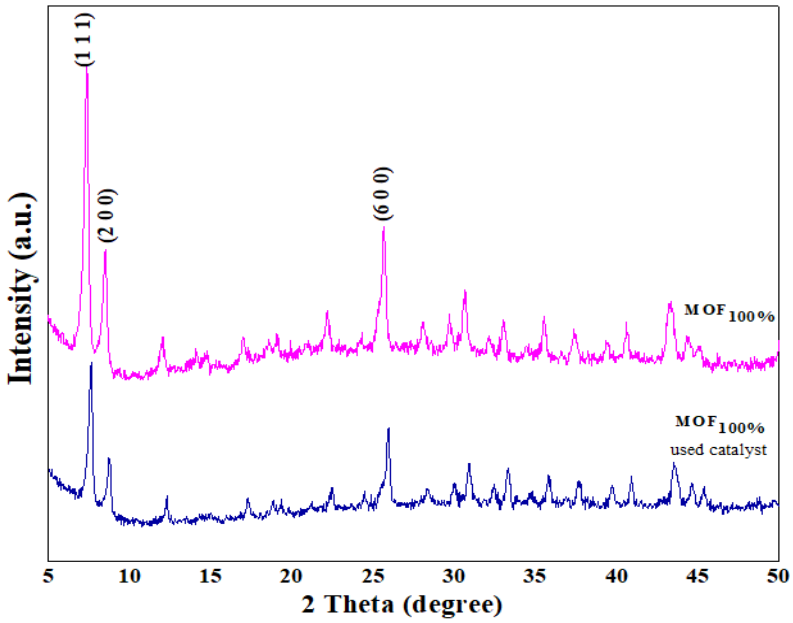

Figure S3. XRD pattern for the used catalyst—batch system.

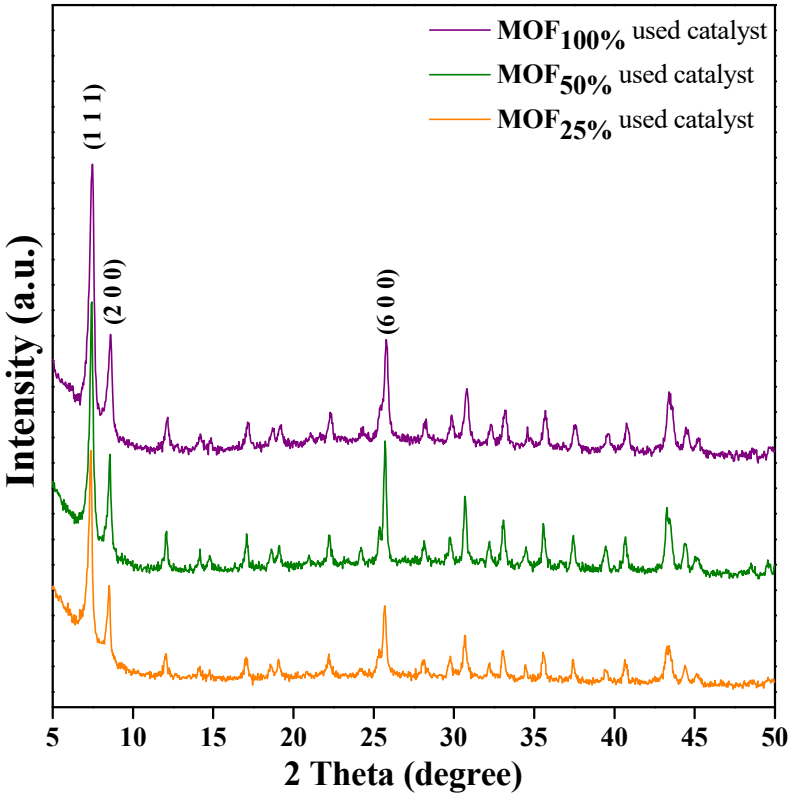

Figure S4. XRD pattern for the used catalyst - pressurized system.

The experimental data were fitted in a pseudo-first order kinetic equation to find the constant of reaction k (Equation (1)).

$$Ln[LA_t] = -k\ t + Ln[LA_0] \quad (1)$$

where $[LA_0]$ is the initial concentration of LA ($mol.L^{-1}$) and $[LA_t]$ is the concentration at any time t. On the other hand, k is the slope and $ln[LA_0]$ is the intercept in a plot of $ln[LA_t]$ versus t (Figure S2).

Therefore, the reaction rate can be expressed as:

$$r_A = -\frac{dC_{LA}}{dt} = k\ C_{LA} \quad (2)$$

Table S1 shows experimental data used in the kinetic model.

Table S1. Estimation of kinetic parameters.

Time (min)	Conversion (%)	[LA]	Ln [LA]	r_{LA}
0	0	95.96	4.56	0.070
60	9.84	90.16	4.50	0.062
120	13.23	86.77	4.46	0.061
180	15.58	84.42	4.44	0.059
240	19.74	80.26	4.39	0.056
300	24.89	75.11	4.32	0.055

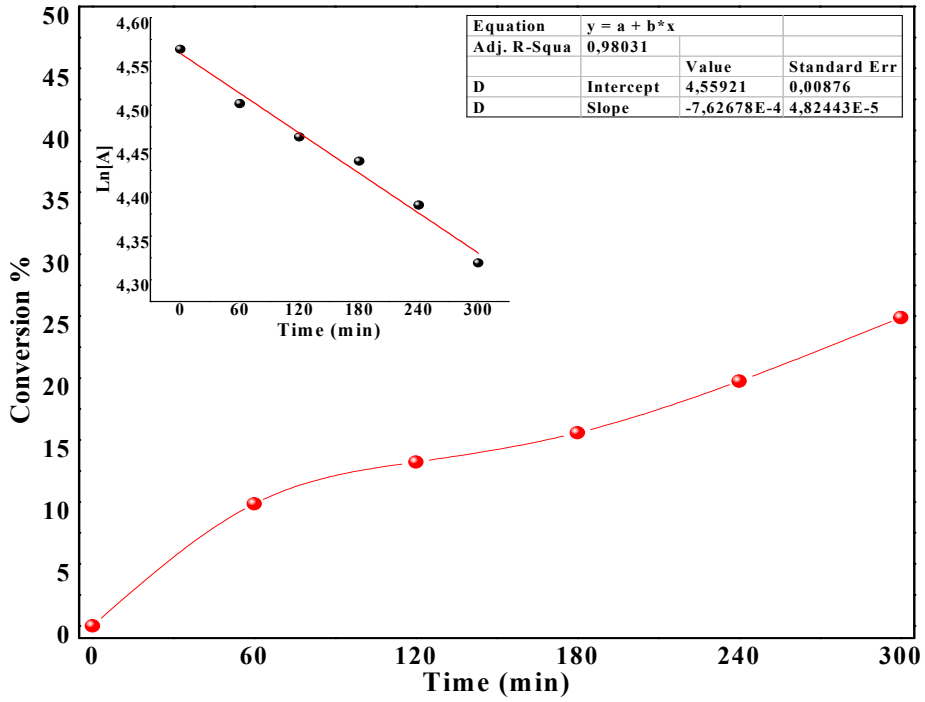

Figure S5. Kinetic constant adjustment (k). Conversion (%) and Ln [LA] vs. Time (min).