

**Preparation of reusable and pore size controllable porous polymer
monolith and its catalysis in biodiesel synthesis**

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Table S1. Arrangement and results of the orthogonal experiment design for the optimization of biodiesel preparation from waste fatty acids

Trial number	MeOH to oil ratio A (w/w)	Catalyst concentration B (respect to oil) (wt.%)	Reaction temperature C (°C)	Reaction time D (h)	Esterification rate (%)
1	0.5	5	50	2	21.3
2	0.5	10	60	4	64.2
3	0.5	15	70	6	82.5
4	0.5	20	80	8	89.9
5	1	5	60	6	67.6
6	1	10	50	8	80.0
7	1	15	80	2	78.3
8	1	20	70	4	91.1
9	1.25	5	70	8	82.9
10	1.25	10	80	6	92.4
11	1.25	15	50	4	65.0
12	1.25	20	60	2	63.9
13	1.5	5	80	4	71.6
14	1.5	10	70	2	60.4
15	1.5	15	60	8	92.3
16	1.5	20	50	6	79.1

Table S2. Range analysis of the orthogonal experiment

Level	Factors			
	MeOH to oil ratio A	Catalyst concentration B	Reaction Temperature C	Reaction time D
K ₁	64.4	60.9	61.4	56.0
K ₂	79.2	74.2	72.0	73.0
K ₃	76.0	79.5	79.2	80.4
K ₄	75.9	81.0	83.0	86.3
R	14.8	20.1	21.7	30.3

Table S3. Univariate analysis of the orthogonal experiment

Source	Type III sum of squares	Freedom degrees	Mean square	F	Sig.
Corrected model	4676.383 ^a	12	389.699	18.818	.017
Intercept	87394.141	1	87394.141	4220.113	.000
MeOH to oil ratio	503.512	3	167.837	8.105	.060
Catalyst concentration	1009.902	3	336.634	16.255	.023
Reaction temperature	1092.762	3	364.254	17.589	.021
Reaction time	2070.207	3	690.069	33.322	.008
Error	62.127	3	20.709		
Total	92132.650	16			
Corrected total	4738.509	15			

a. $R^2 = .987$ (Adjusted $R^2 = .934$)