

### **Supplementary information**

#### **Biocatalytic synthesis of flavor ester ‘pentyl valerate’ using lipase immobilized in microemulsion based organogels: Impact of parameters on ester production**

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**Table S1:**  $W_o$  and  $P_o$  values of the reverse micellar systems prepared using the four surfactants AOT, CTAB, Tween 80 and Triton X-100 in combination with the three organic solvents n-hexane, n-heptane and isooctane. 1-hexanol was used as the co-surfactant in case of CTAB, Tween 80 and Triton X-100.

Surfactant	Organic solvents					
	Isooctane		n-hexane		n-heptane	
	$W_o$	$P_o$	$W_o$	$P_o$	$W_o$	$P_o$
<b>AOT</b>	60	-	50	-	70	-
<b>CTAB</b>	30	14.43	60	12.83	80	9.62
<b>Triton X 100</b>	50	15.92	30	14.43	50	19.24
<b>Tween 80</b>	40	12.83	40	11.22	50	16.04

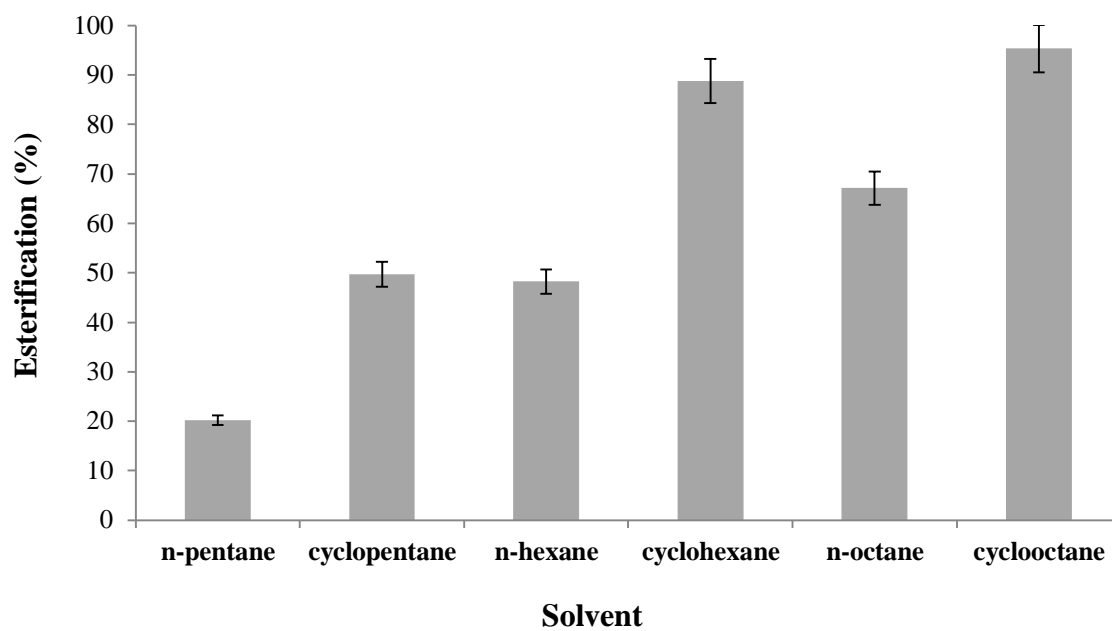
**Table S2: The analysis of variance (ANOVA) for esterification (%)**

Source	Degree of freedom	Sum of squares	Mean of squares	F value	P value
Blocks	9	2702.1	60.81	1.06	0.404
Regression	20	28242.2	1412.11	24.66	<b>0.000</b>
Linear	5	22895.2	4541.32	79.29	<b>0.000</b>
Square	5	3009.4	524.09	9.15	<b>0.000</b>
Interaction	10	2337.6	233.76	4.08	<b>0.000</b>
Residual error	60	3436.4	57.27	-	-
Lack of fit	58	3406.5	58.73	3.92	0.224
Pure error	20	29.9	14.97	-	-
Total	89	34380.7	-	-	-

$$R^2 = 0.90 \quad R^2_{adj} = 0.85$$

**Table S3:** Estimation of residual water using Karl-Fischer titration and TGA weight loss curves

<b>Organogel</b>	<b>Karl-Fischer titration</b>	<b>TGA weight loss analysis</b>	
	<b>Water (%)</b>	<b>Residual weight (%)</b>	<b>Water (%)</b>
<b>Fresh</b>	10.86 ± 0.9	88.16 ± 2	11.84
<b>Reused</b>	14.65 ± 2	87.75 ± 0.9	12.25
<b>Reused and treated with AOT/isooctane</b>	8.23 ± 3	89.27± 2	10.73



**Figure S1:** Effect of straight chain and cyclic hydrocarbons on ester synthesis. The reaction was carried out using AOT/isooctane/gelatin MBGs at 37 °C and 150 rpm for 96h.