

SUPPLEMENTARY MATERIAL

Improving the cold flow behavior of methyl biodiesel by blending it with ethyl esters

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Table S1. Experimental solid-liquid equilibrium data ($T = [K]$) for the ethyl palmitate + methyl palmitate system

$x_{\text{ethyl palmitate}}$	$T_{\text{crystallization}}$	T_{eutectic}	$T_{\text{metatectic}}$	$T_{\text{solid transition}}$	T_{melting}
0.10	297.89			300.27	301.13
0.20	294.50			298.54	299.66
0.30	294.62		296.27		297.45
0.40	294.51		295.94		296.56
0.50	293.96	294.25			295.30
0.60	294.21	294.10			295.05
0.70	293.90	294.45	295.07		295.75
0.80	293.38	294.65	295.50		296.42
0.90	292.99	294.44	295.41		296.77

Table S2. Experimental solid-liquid equilibrium data ($T = [K]$) for the ethyl stearate + methyl palmitate system

$x_{\text{ethyl stearate}}$	$T_{\text{crystallization}}$	T_{eutectic}	$T_{\text{metatectic}}$	$T_{\text{peritectic}}$	T_{melting}
0.10	295.13	297.48	298.40		301.56
0.20	296.15	297.69	298.66		299.69
0.30	296.75	297.15			297.71
0.40	297.86	297.42			298.61
0.50	299.02	297.52			300.00
0.60	300.44				300.99
0.70	301.56			302.33	303.21
0.80	302.41			302.74	304.60
0.90	303.23			302.69	305.71

Table S3. Experimental solid-liquid equilibrium data ($T = [K]$) for the ethyl oleate + methyl palmitate system

$x_{\text{ethyl oleate}}$	$T_{\text{crystallization}}$	T_{eutectic}	T_{melting}
0.10	294.83	250.59	299.93
0.20	293.05	250.56	298.05
0.30	292.18	250.47	297.04
0.40	290.60	250.73	295.02
0.50	289.29	250.81	293.20
0.60	282.50	250.59	289.35
0.70	277.00	250.91	284.50
0.80	269.65	250.68	280.07
0.90	252.98	251.08	269.15

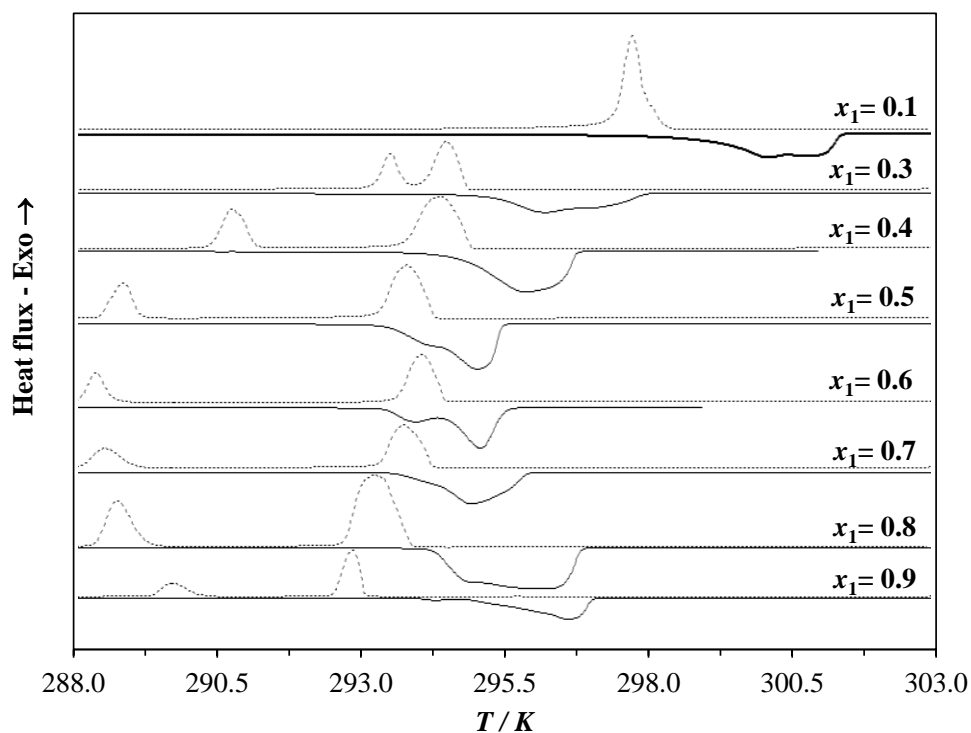


Figure S1. DSC thermograms for the ethyl palmitate (1) + methyl palmitate (2) system. Dashed lines are for the cooling ramp and continuous line are for the heating ramp.

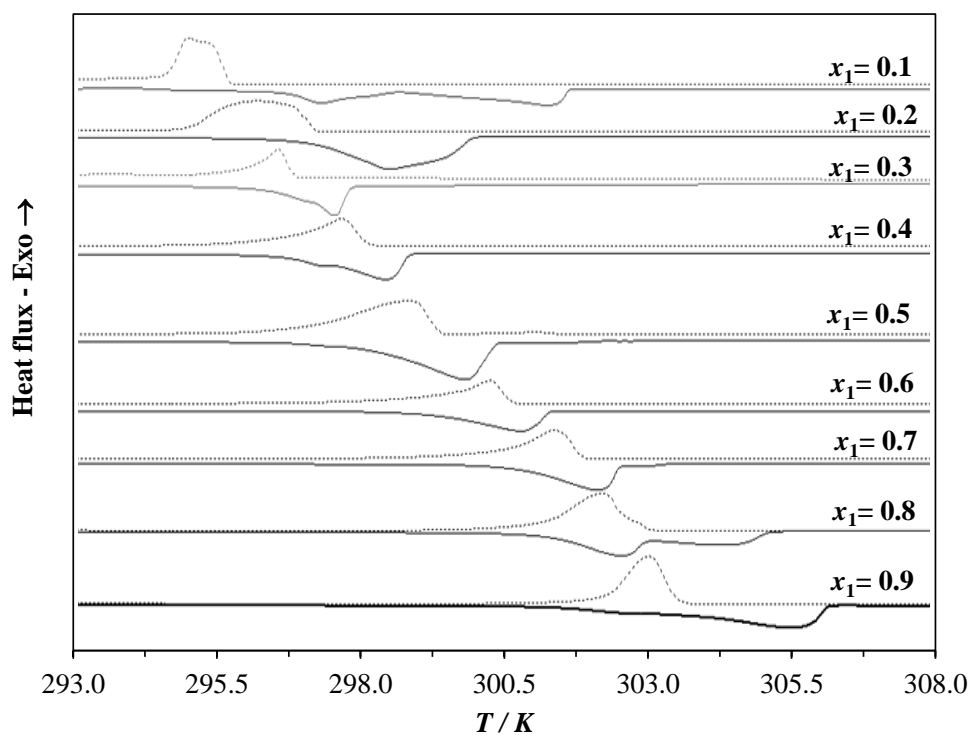


Figure S2. DSC thermograms for the ethyl stearate (1) + methyl palmitate (2) system. Dashed lines are for the cooling ramp and continuous line are for the heating ramp.

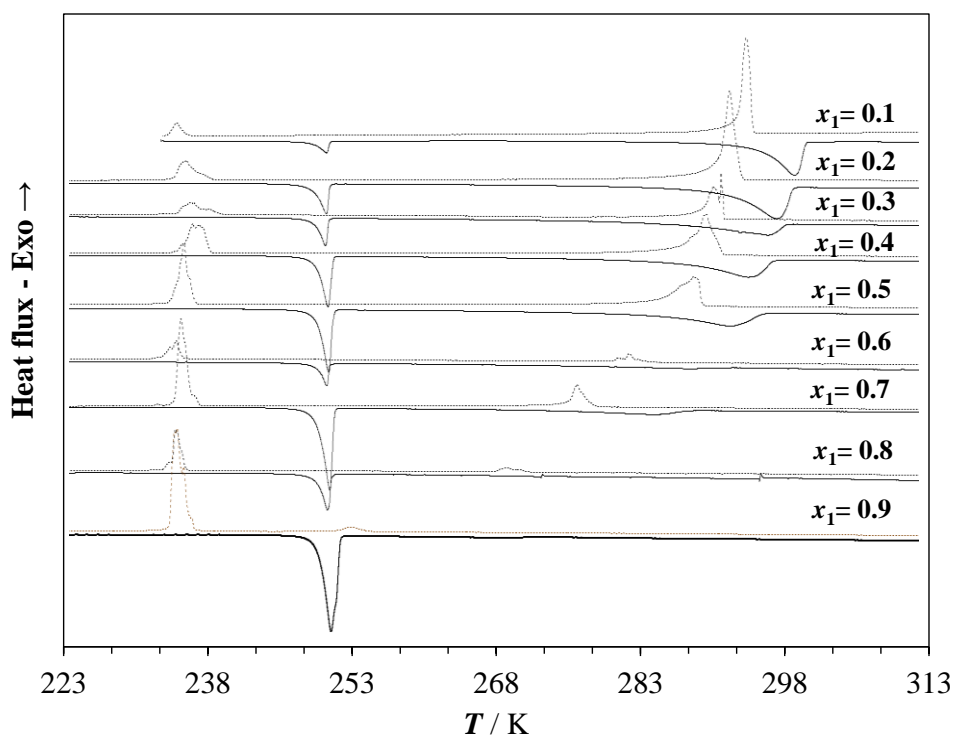


Figure S3. DSC thermograms for the ethyl oleate (1) + methyl palmitate (2) system. Dashed lines are for the cooling ramp and continuous lines are for the heating ramp.

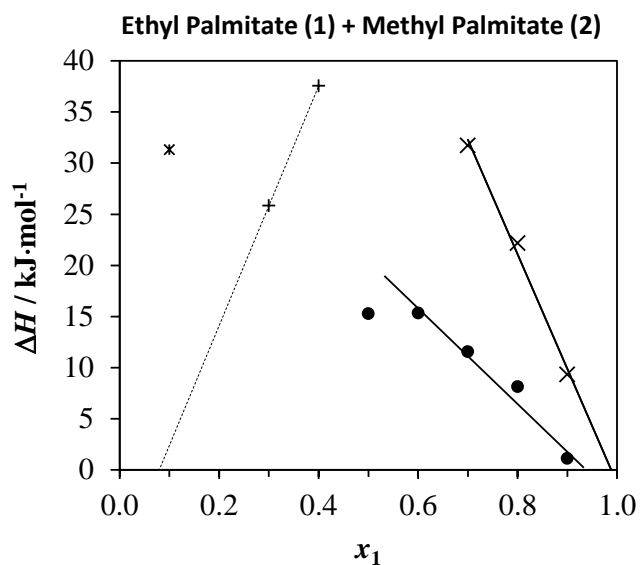


Figure S4. Tammann plots of the invariant transitions for the system ethyl palmitate (1) + methyl palmitate (2). Symbols: (●) eutectic transition; (×, +) metatectic transition. (*) solid-solid transition.

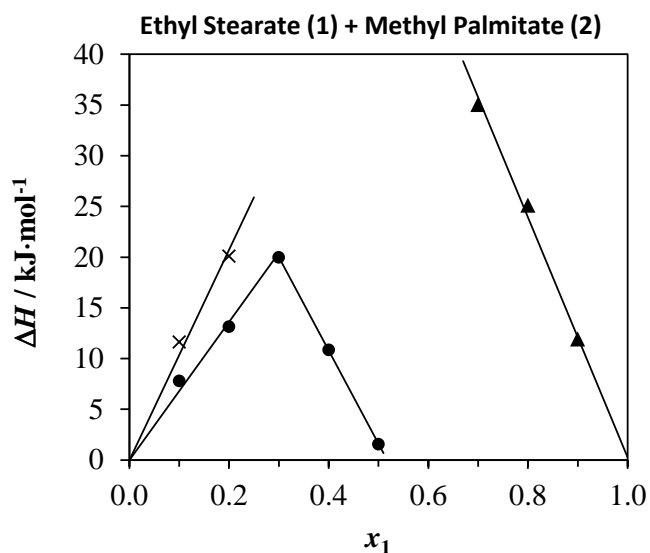


Figure S5. Tammann plots of the invariant transitions for the system ethyl stearate (1) + methyl palmitate (2). Symbols: (●) eutectic transition; (x) metatectic transition; (▲) peritectic transition.

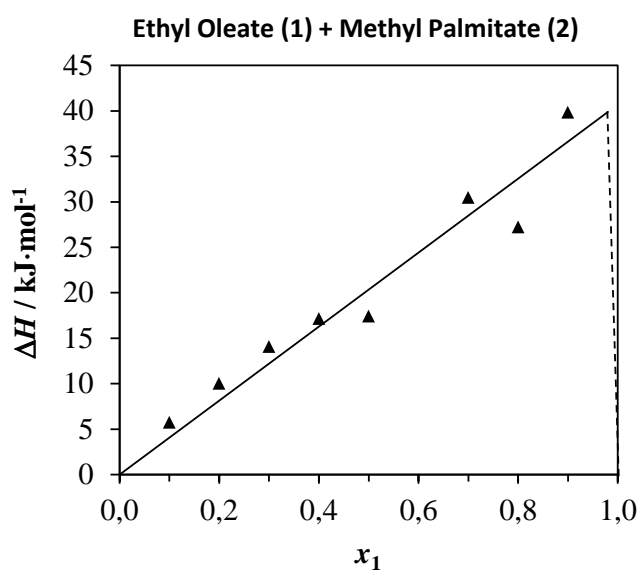


Figure S6. Tammann plots of the invariant transitions for the system ethyl oleate (1) + methyl palmitate (2). Symbols: (▲) eutectic transition.