Supporting information

Isobaric Vapor-Liquid Equilibrium Data for water (1) + 2-methyl-propan-1-ol (2), 2-methyl-propan-1-ol (1) + pyridine (2), and water (1) + 2-methyl-propan-1-ol (2) + pyridine (3) systems

Kuveneshan Moodley, Mishqah Hussain, Paramespri Naidoo, Theasha Naidoo*

Thermodynamics Research Unit, School of Engineering, University of KwaZulu-Natal, Howard College Campus, King George V Avenue, Durban, 4041, South Africa

*To whom correspondence should be addressed: moodleyk6@ukzn.ac.za; Tel.: +27 31 2601519

Table S1. Shimadzu GC2014 operating conditions.

Operating conditions	
Carrier gas	Helium
Carrier gas flow rate (mL/min)	30
Detector type	TCD
Column	PORAPAK-Q column (2 m x 2.2 mm)
Injector temperature (K)	513.15
Column temperature (K)	513.15
Detector temperature (K)	513.15

Example calculation for combined standard uncertainty in pressure:

$$u_c(P) = \left((u(P_{supplier}))^2 + (u(P_{calibration\ accuracy}))^2 + (u(P_{repeatibility}))^2\right)^{\frac{1}{2}} \quad \text{(S1)}$$

$$= \left(0.08^2 + 0.1^2 + 0.1^2\right)^{\frac{1}{2}}$$

$$= 0.163 \text{ kPa}$$

And for combined expanded uncertainty in pressure.

$$U_c(P) = k * u_c(P) \quad \text{(S2)}$$

$$= 2 * 0.163$$

$$= 0.33 \text{ kPa}$$

Consistency testing

Table S2. Results of the consistency tests.

System	Calculated criterion			Consistency test result
	Infinite dilution test of Kojima et al.[26] (Criteria: $I_j < 30$)		Point test of Fredenslund [27] (Criteria: AAD < 0.01)	
	I_1	I_2	AAD	
water (1) + 2-methyl-propan-1-ol (2)				
P/kPa = 50.9	19.567	8.613	0.002	Passed both tests
P/kPa = 80.1	16.836	12.719	0.003	Passed both tests
P/kPa = 100.2	5.826	16.148	0.003	Passed both tests
2-methyl-propan-1-ol (1) + pyridine (2)				
P/kPa = 51.1	4.888	2.111	0.001	Passed both tests
P/kPa = 81.5	2.326	1.063	0.001	Passed both tests
P/kPa = 101.3	3.643	1.668	0.002	Passed both tests

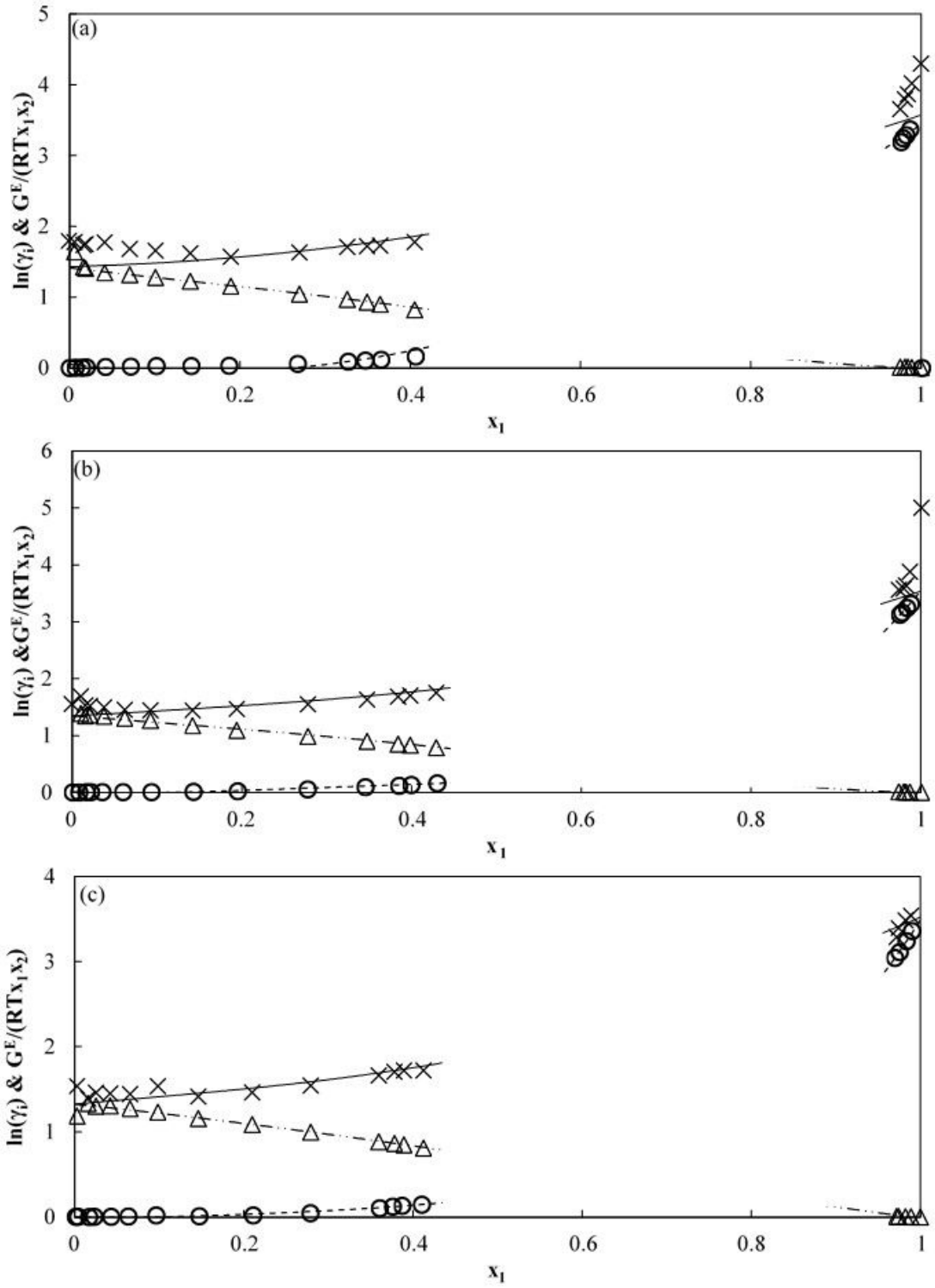

Figure S1. Plots to show coherence of $\ln\gamma_1$ (−···−Δ−···−) and $\ln\gamma_2$ (--○--) with $G^E/(RTx_1x_2)$(−×−) for the water (1) + 2-methyl-propan-1-ol (2) system at (a) 50.9, (b) 80.9 and (c) 100.2 kPa for the infinite dilution test of Kojima et al.[26].

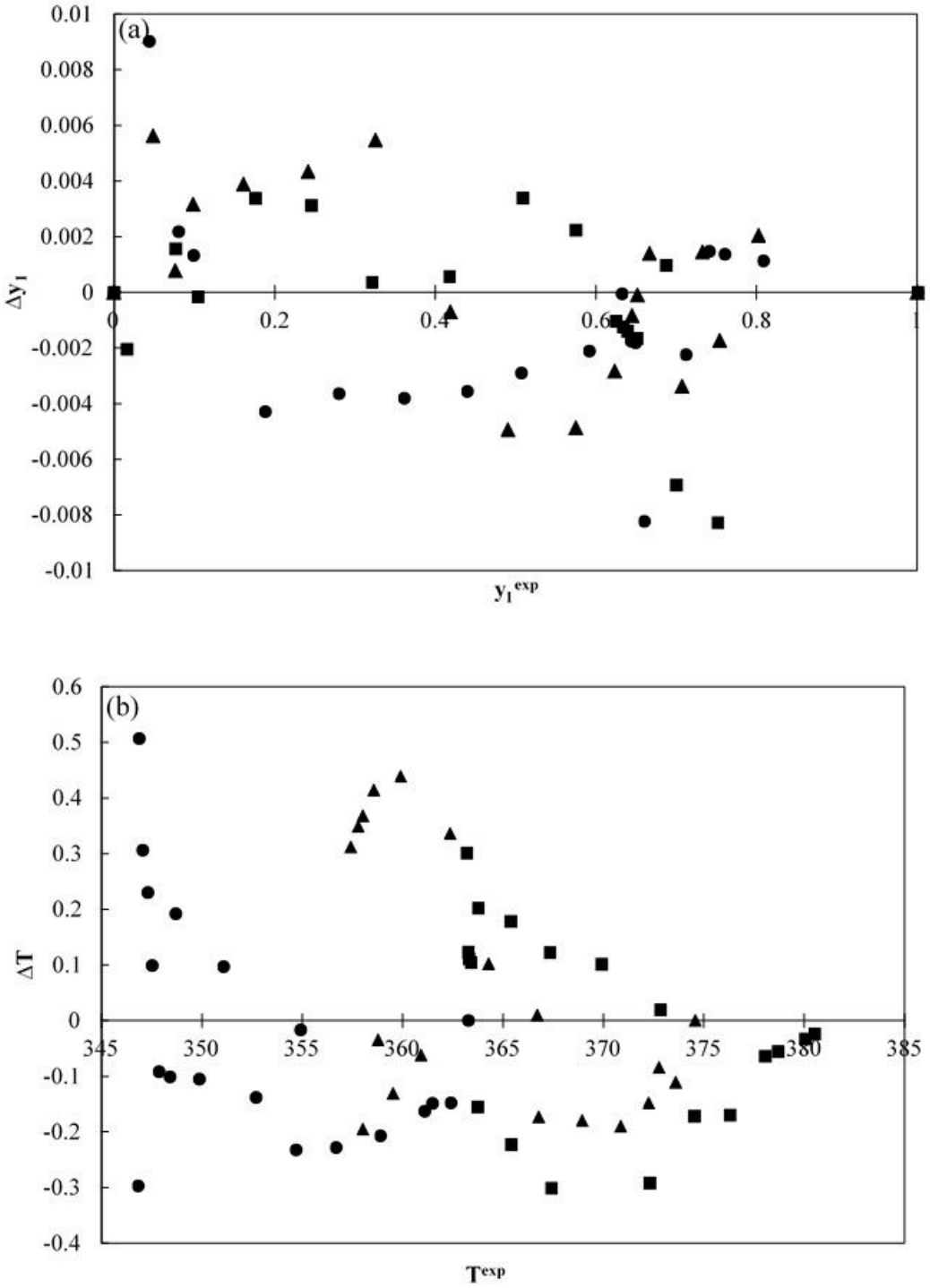

Figure S2. Plot of deviations in (a) y and (b) T for the water (1) + 2-methyl-propan-1-ol (2) system at 50.9 (●), 80.9 (▲), 100.2 (■), for use in the point test of Fredenslund [27].

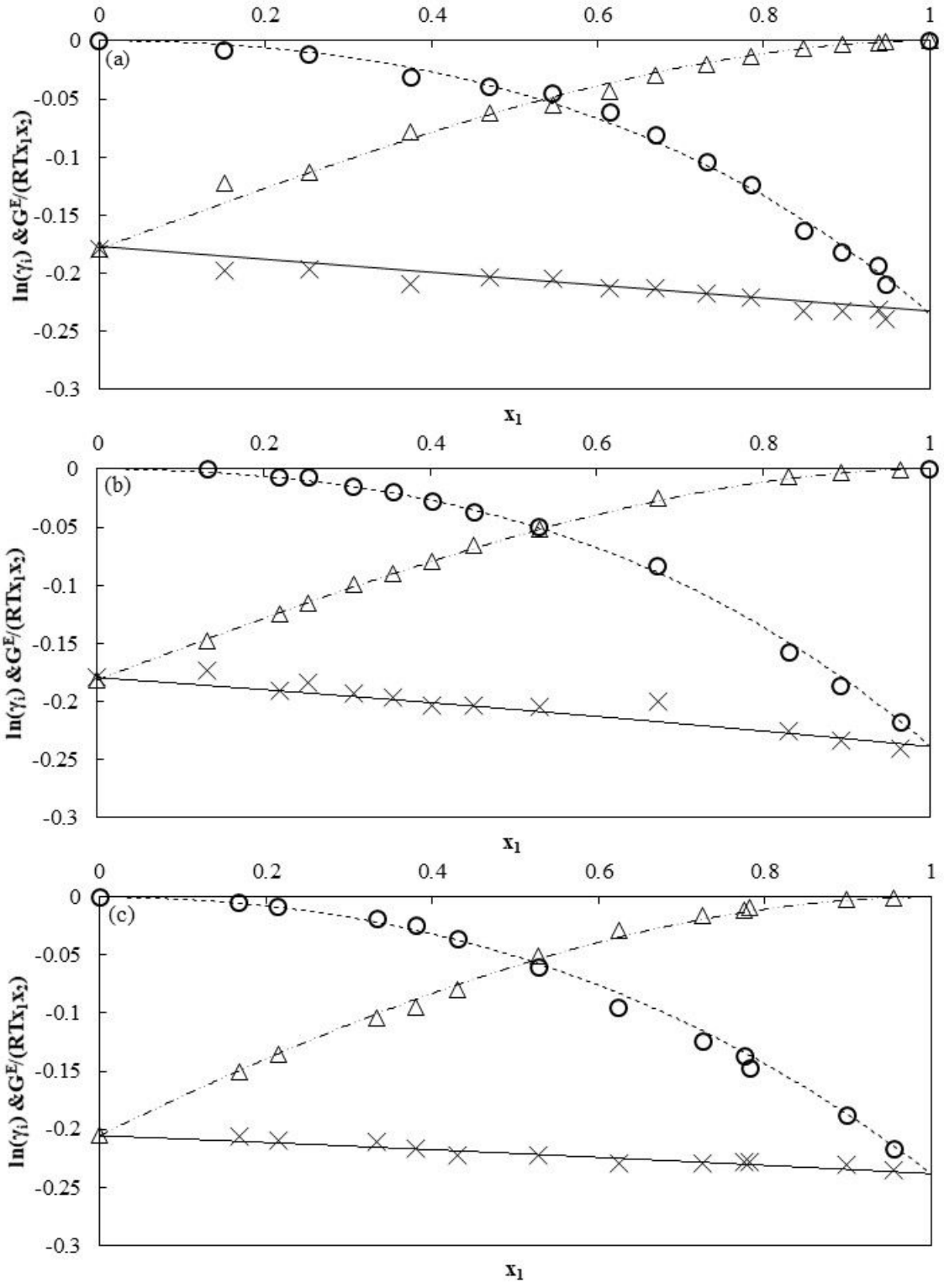

Figure S3. Plots to show coherence of $\ln\gamma_1$ (−···Δ−···−) and $\ln\gamma_2$ (--○--) with $G^E/(RTx_1x_2)$(−×−) for the 2-methyl-propan-1-ol (1) + pyridine (2) system at (a) 51.1, (b) 81.5 and (c) 101.3 kPa for the infinite dilution test of Kojima et al.[26].

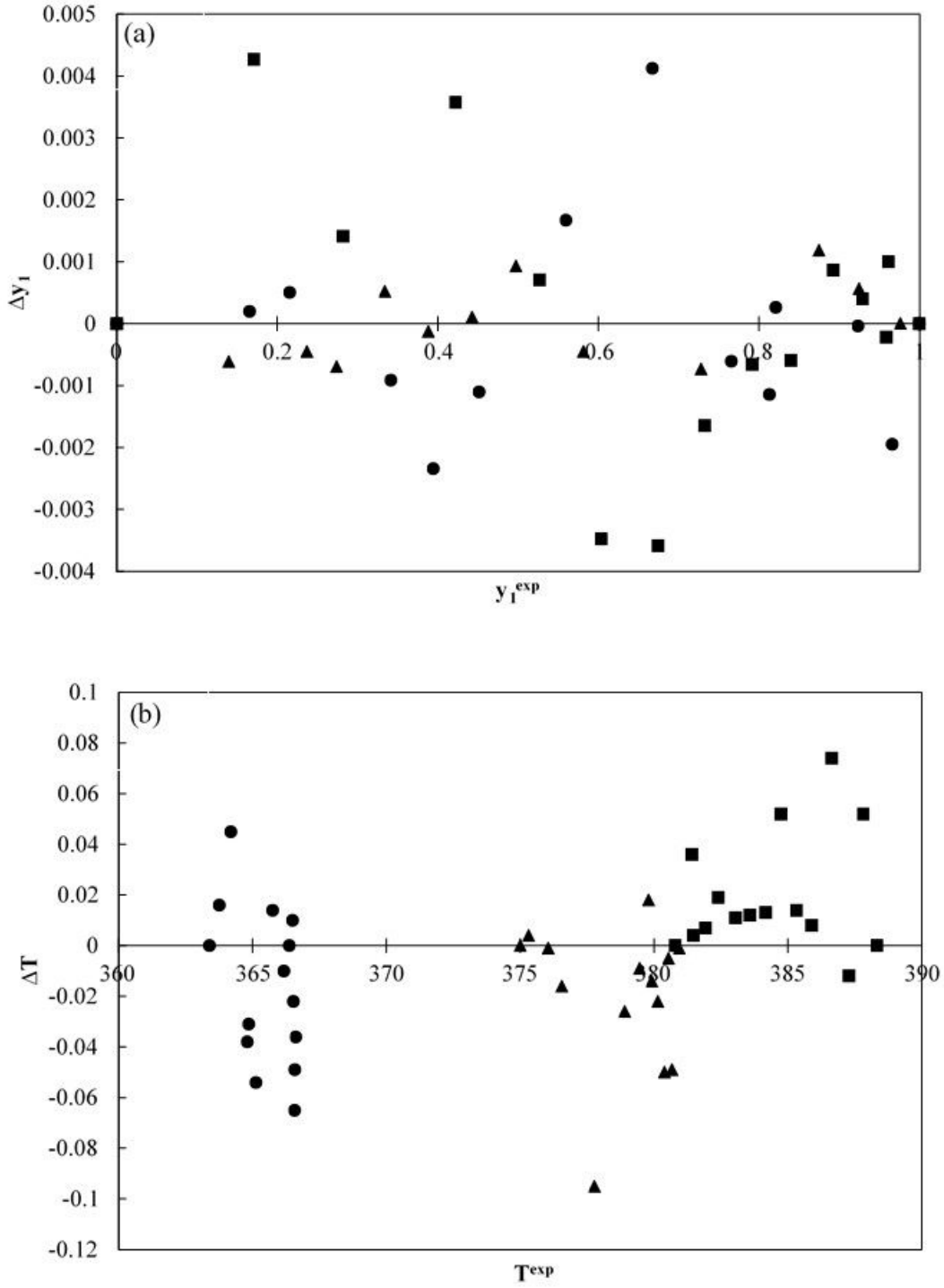

Figure S4. Plot of deviations in (a) y and (b) T for the 2-methyl-propan-1-ol (1) + pyridine (2) system at 51.1(●), 81.5 (▲), 101.3 (■), for use in the point test of Fredenslund [27].