411 **List of Tables**

412 **Table 1.** Characterisation of real wastewater and digested sludge inoculum (average
413 concentration ± standard deviation from at least three samples).

Parameters	Units	Wastewater	Digested sludge
Chemical oxygen demand (COD)	mg/L	288 ± 10	4,000 ± 60
Electrical conductivity (EC)	µS/cm	977 ± 4	5,230 ± 8
Total solids (TS)	%	0.07 ± 0.02	1.7 ± 0.5
Volatile solids (VS)	%	0.03 ±0.01	1.1 ± 0.3

414

415 **Table 2.** Variation in pre-concentrated wastewater conductivity and COD simulated in BMP
416 experiments for NaCl and NaOAc. The calculated total COD in each BMP bottle (750 mL) is
417 also shown. Two BMP experiments were performed and each condition was conducted in
418 duplicate.

Condition	FO water recovery (%)	Pre-concentrated wastewater conductivity (µS/cm)	Pre-concentrated wastewater COD (mg/L)	Total COD in each BMP bottle (mg)
Reference	-	-	-	4,000
Real wastewater	0	977	288	4,072
Synthetic wastewater + NaCl	50	2,449	540	4,135
	80	7,846	1,079	4,270
	90	16,750	2,280	4,570
Synthetic wastewater + NaOAc	50	1,889	540	4,675
	80	6,122	1,079	6,306
	90	8,900	2,280	7,588

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421 **Table 3.** Draw solute replenishment cost and unit cost of methane production using NaCl and
422 NaOAc. Draw solute replenishment costs were based on the average wholesale salt cost and
423 the pure water flux performance (J_w and J_s) for each draw solution at 30 bar osmotic pressure.
424 Draw solute cost per methane produced was determined at 90% FO water recovery.

Parameter	**Units**	**NaCl**	**NaOAc**
Water flux (J_w)	L/m^2h	18.1	16.9
Reverse solute flux (J_s)	g/m^2h	12.4	2.2
Specific reverse solute flux (J_s/J_w)	$g/L_{permeate}$	0.69	0.13
Salt cost	\$/kg	0.05	0.3
Replenishment cost	$\$/ML_{permeate}$	34.25	39.23
Specific methane production at 90% FO water recovery	L CH_4/ L substrate	0.48	0.66
Unit cost of methane production	$\$/m^3$ CH_4 produced	0.64	0.53

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426

List of Figure Captions

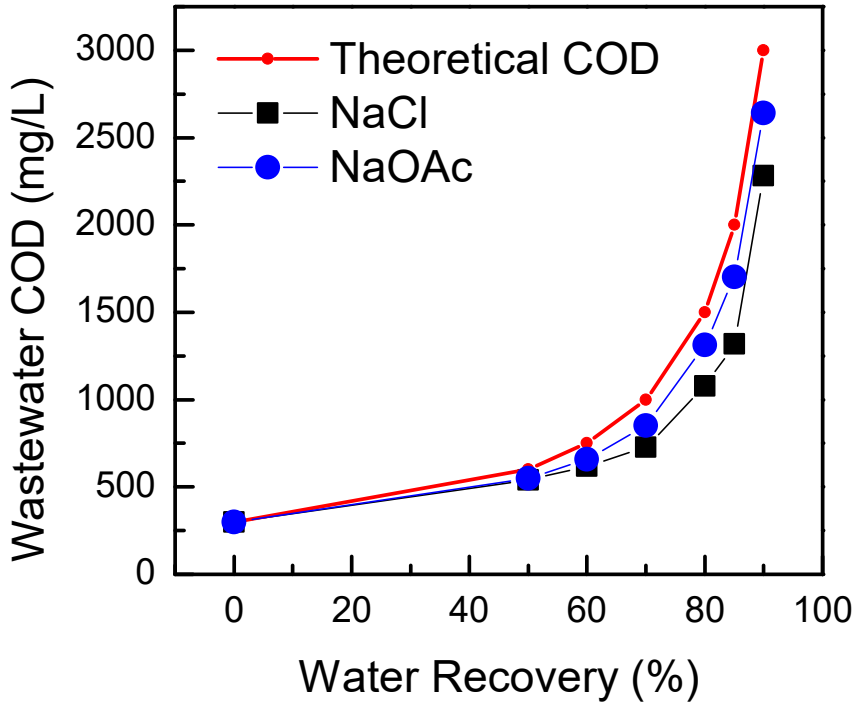
Figure 1: Pre-concentration of wastewater COD using NaCl and NaOAc draw solutions with the TFC FO membrane. Theoretical COD increase is shown assuming 100% COD retention. Experimental conditions: primary effluent feed solution (2 L); π = 30 bar draw solution; cross-flow rates of both feed and draw solutions were 1 L/min (corresponding to a cross-flow velocity of 16.7 cm/s).

Figure 2: Variation in wastewater conductivity for NaCl and NaOAc draw solutions. Theoretical salt accumulation ($Salt_{Acc}$) from natural wastewater salinity only (i.e. excluding reverse draw solute flux) is shown assuming 100% salt retention Experimental conditions as in Figure 6.1.

Figure 3: Average cumulative methane production over the 30 day evaluation period at various wastewater (WW) pre-concentration stages using (A) NaCl and (B) NaOAc FO draw solutions. Error bars represent n=4 measurements, including two BMP experiments with each condition performed in duplicate.

Figure 4: Specific methane production over the experimental period, indicating no negative effect of pre-concentrated wastewater up to 90% water recovery. Experimental conditions as in Figure 6.3. Error bars represent n=4 measurements, including two BMP experiments with each condition performed in duplicate.

Figure 5: Water flux decline and recoverability during FO pre-concentration with TFC membrane. After achieving 90% water recovery, membrane flushing was performed for 30 min using DI water at double the experimental cross-flow velocity (i.e. 33.4 cm/s)). Experimental durations corresponding to 90% recovery were 65 and 72 hours for NaCl and NaOAc, respectively. Initial water flux was 17.4 L/m^{2}h for NaCl and 16.6 L/m^{2}h for NaOAc. Experimental conditions as in Figure 1.



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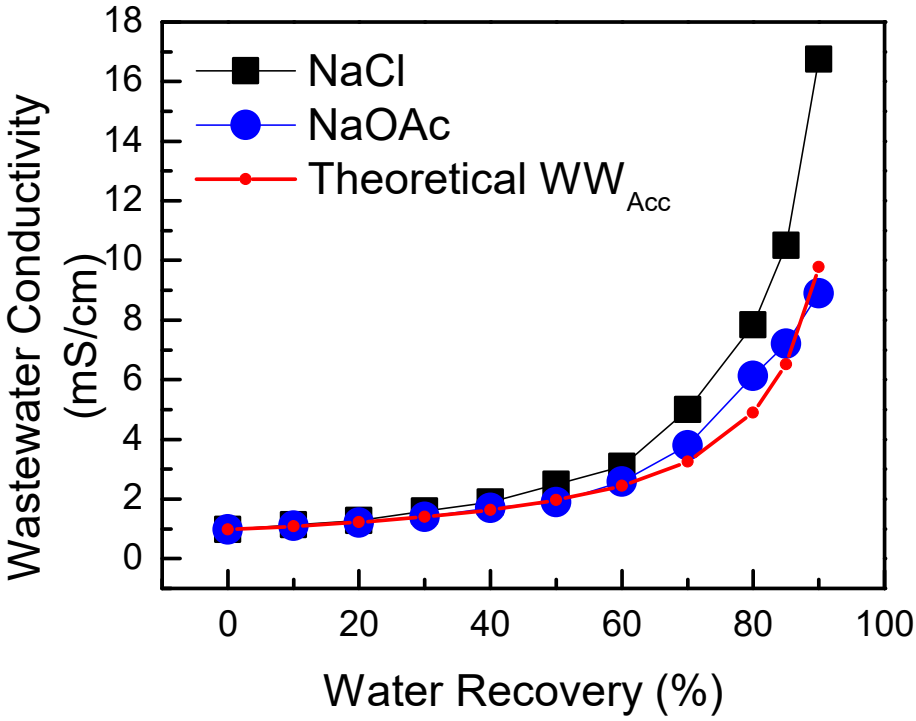
452 **Figure 1**



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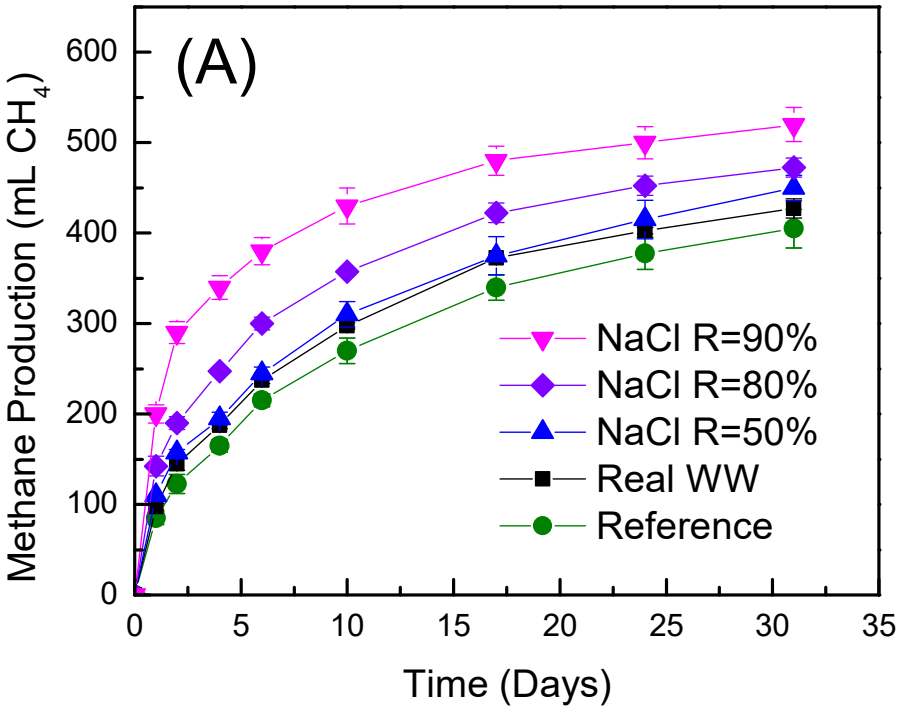
454 **Figure 2**



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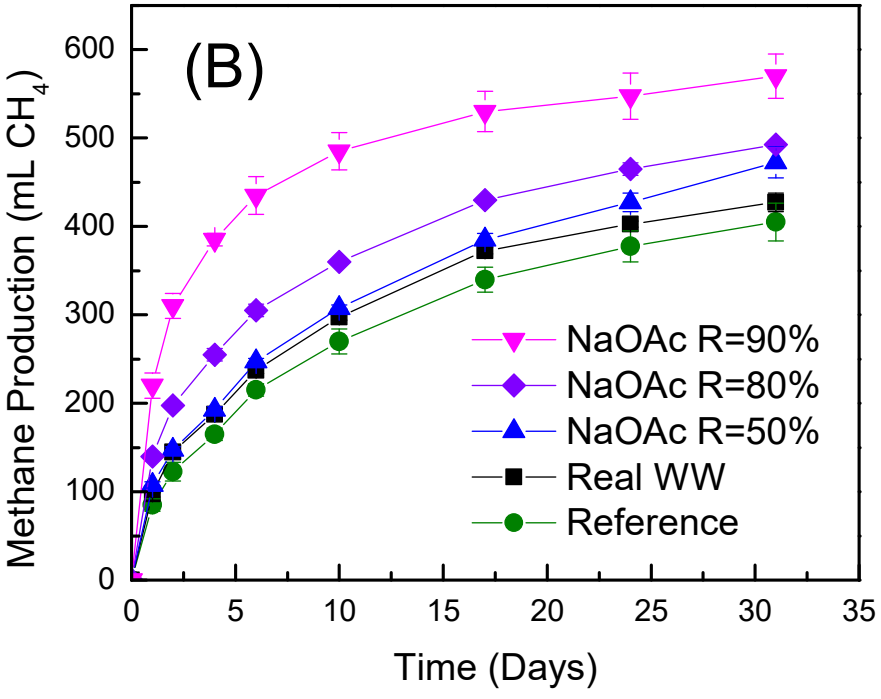

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457 **Figure 3**

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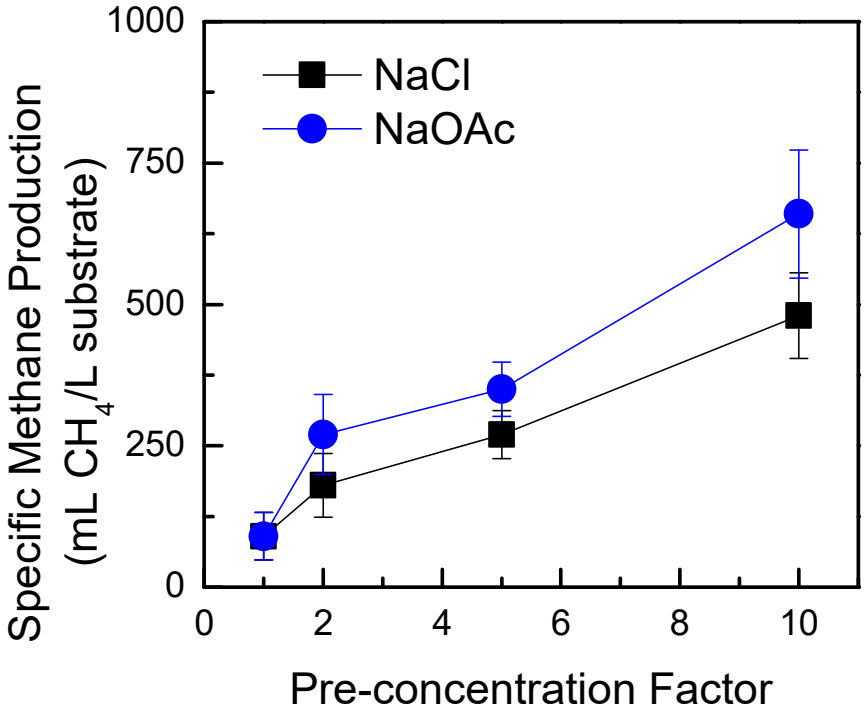

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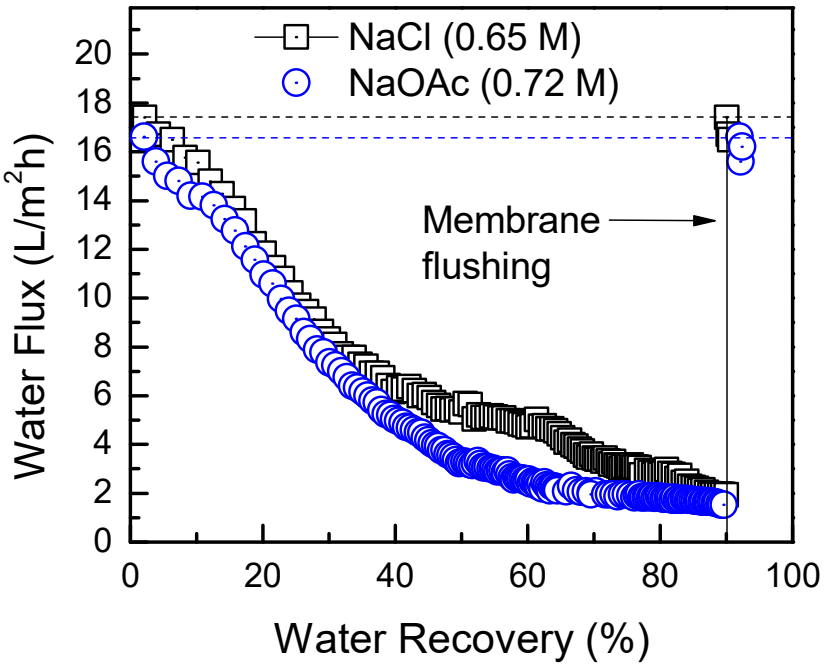
460 **Figure 4**



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463 **Figure 5**