

Supplementary Material

Effect of micro-aeration on syntrophic and methanogenic activity in anaerobic sludge

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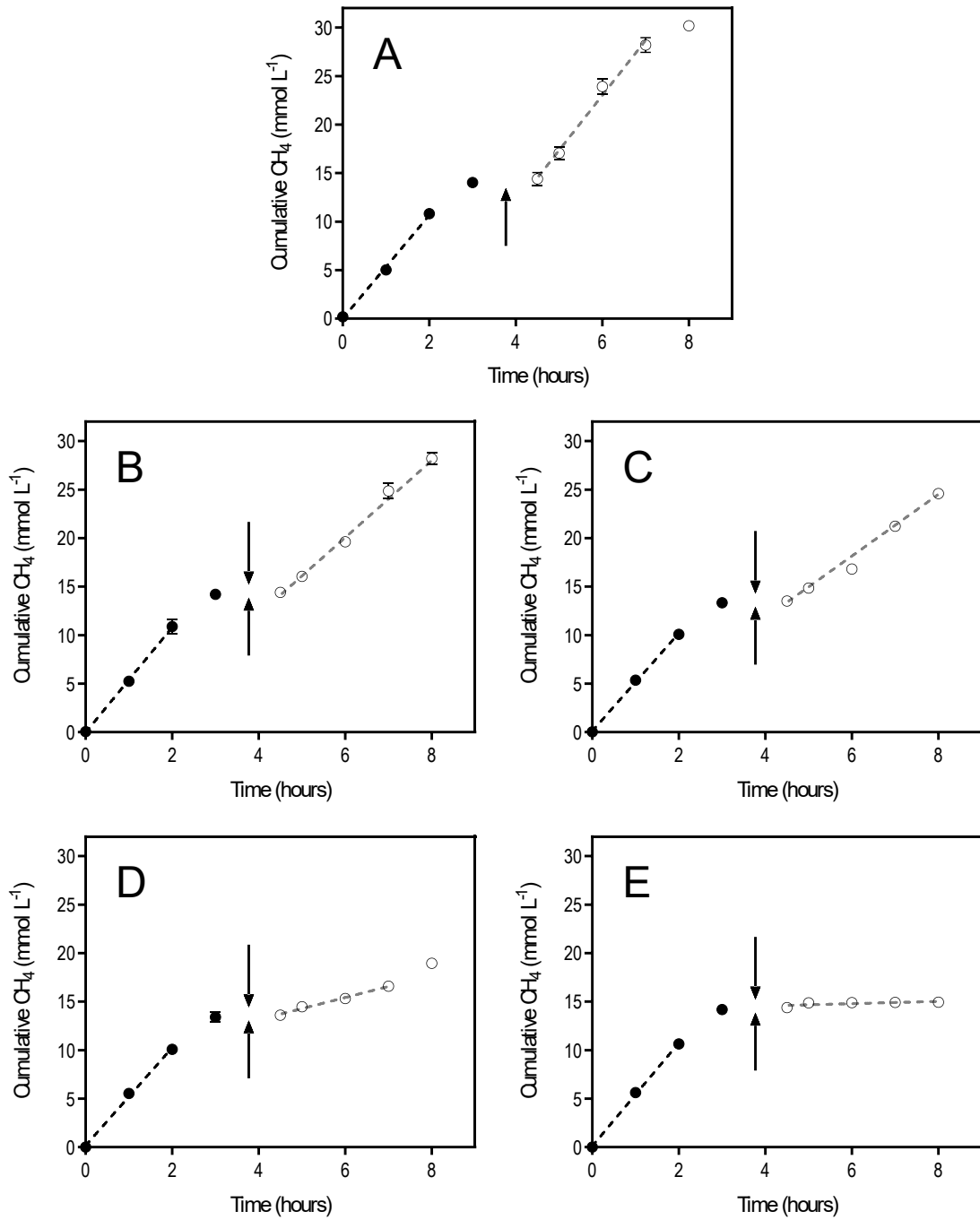


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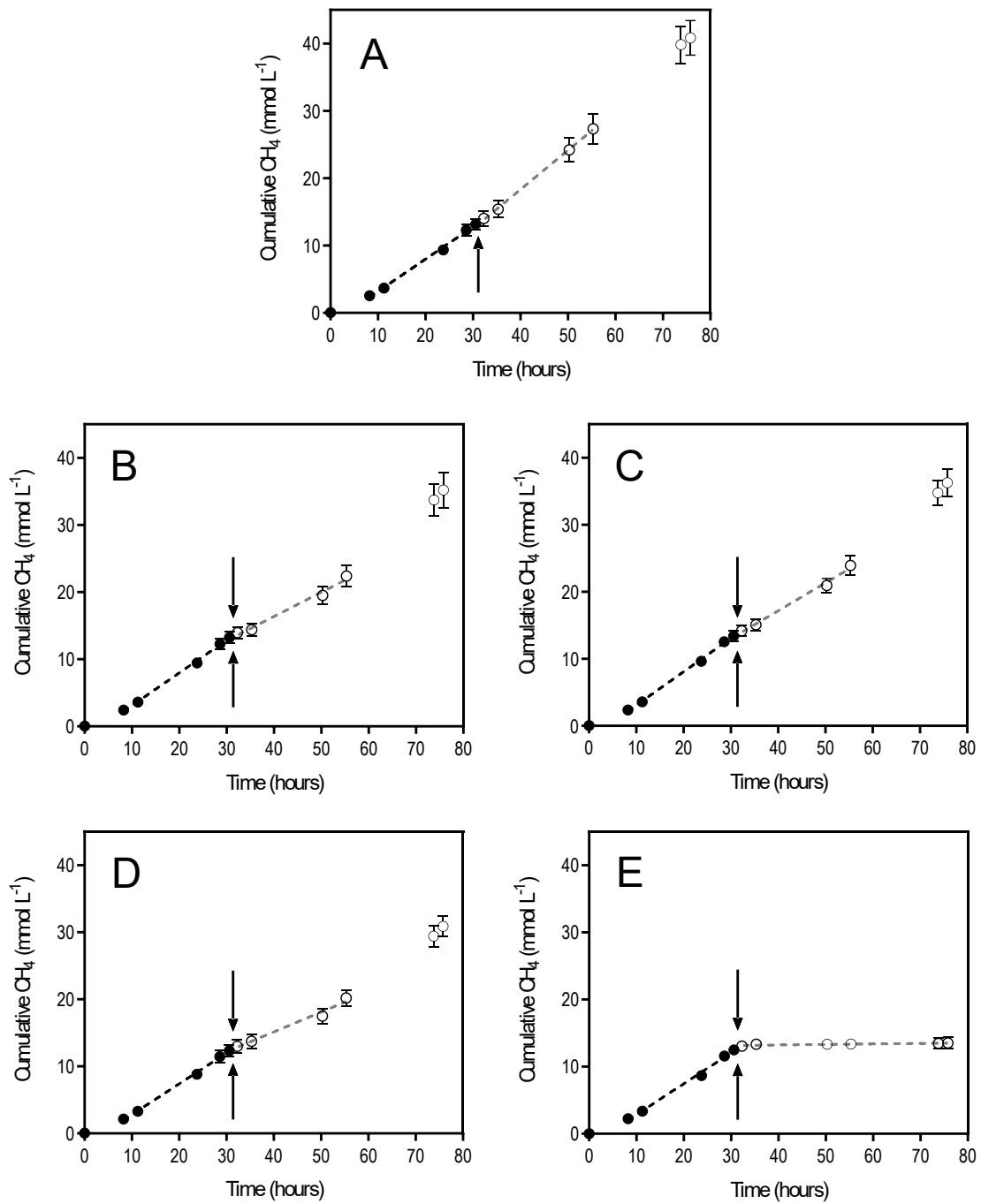


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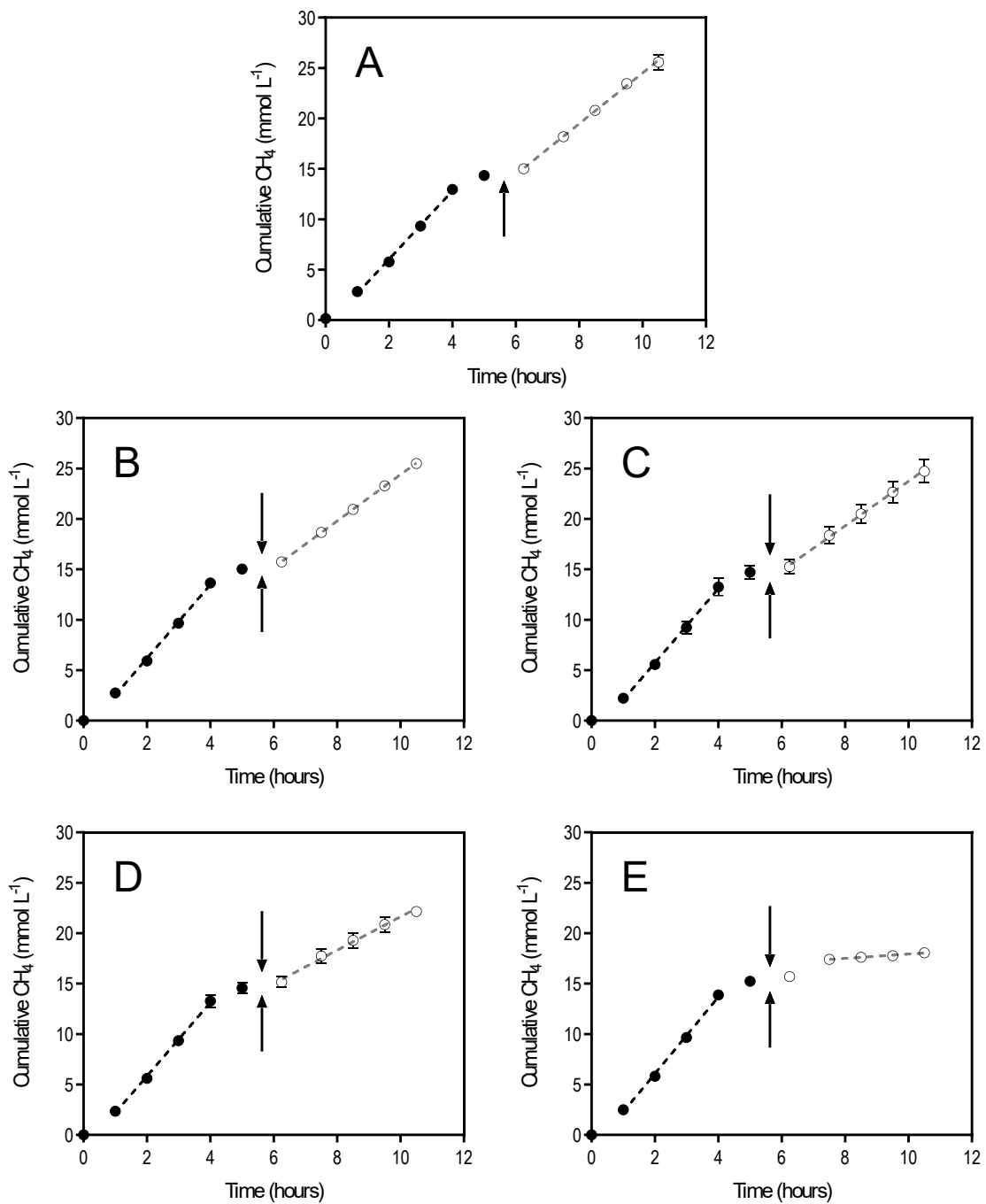


Figure S3. Effect of different O_2 concentrations on cumulative methane production from ethanol, in P1 (●) and P2, (○): 0 % O_2 (A), 0.5 % O_2 (B), 1 % O_2 (C), 2.5 % O_2 (D) and 5 % O_2 (E). Dashed lines show the data points used to calculate the MPR in P1 (black dashed lines) and P2 (grey dashed lines). (↓) indicates the moment of air addition and (↑) indicates ethanol replenishment. Each data point represents the average of triplicates $\pm$ standard deviation.

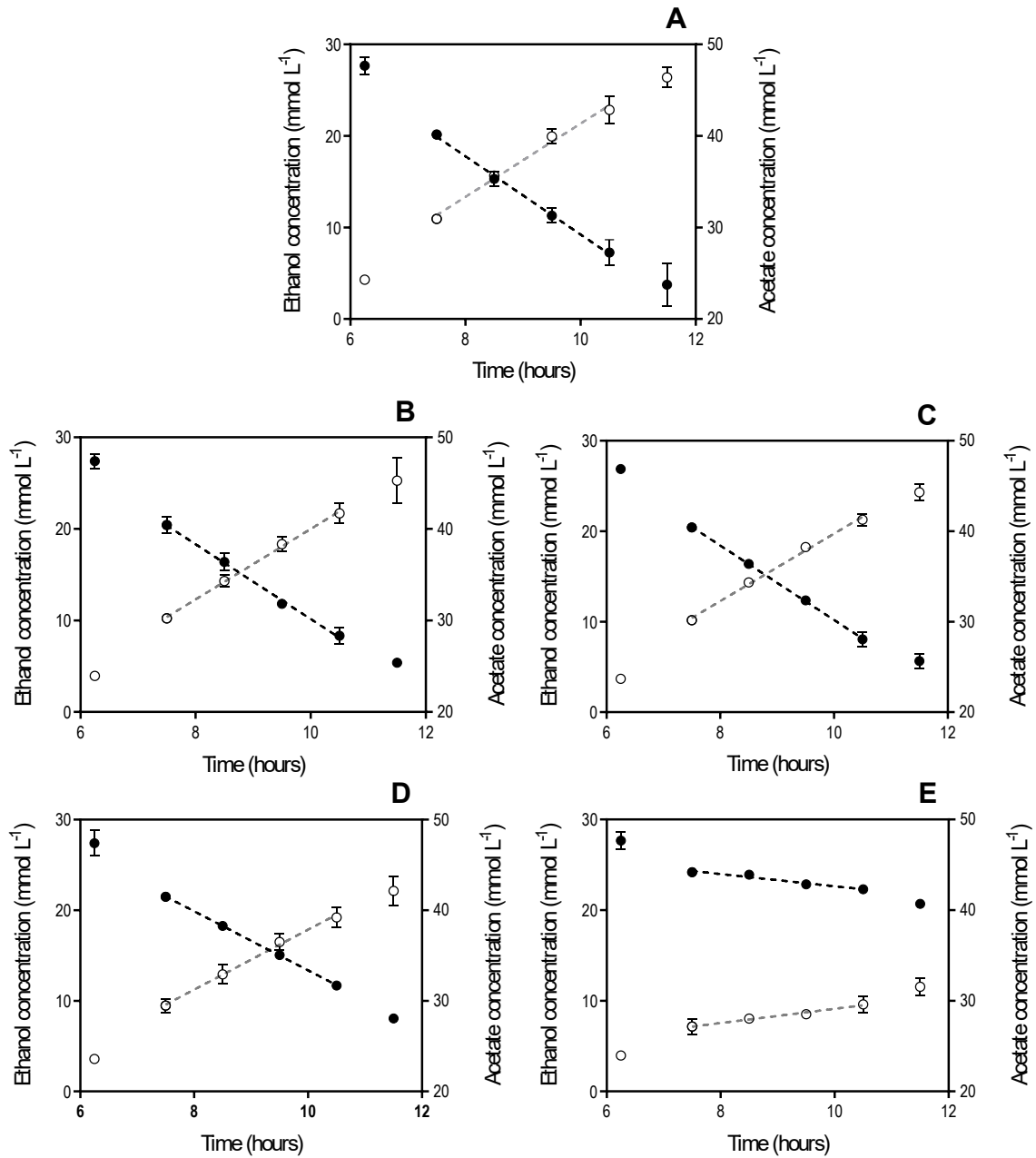


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Table S1. H₂ and acetate concentrations at the beginning of P1 and P2, and total consumption (average of triplicates $\pm$ standard deviation).

Substrate	P1		O ₂ (%)	P2	
	Initial concentration (mmol L ⁻¹) ^(a)	Total consumption (mmol L ⁻¹)		Initial concentration (mmol L ⁻¹) ^(a)	Total consumption (mmol L ⁻¹)
H ₂ /CO ₂	55.6 $\pm$ 0.6	48.6 $\pm$ 2.2	0	53.2 $\pm$ 1.2	49.3 $\pm$ 1.4
	53.5 $\pm$ 0.5	48.2 $\pm$ 1.5	0.5	51.6 $\pm$ 0.5	43.5 $\pm$ 1.5
	53.4 $\pm$ 0.3	44.9 $\pm$ 0.7	1.0	48.5 $\pm$ 2.3	32.8 $\pm$ 2.6
	53.2 $\pm$ 0.3	46.0 $\pm$ 1.1	2.5	46.1 $\pm$ 0.6	12.9 $\pm$ 1.1
	53.5 $\pm$ 0.5	48.3 $\pm$ 3.6	5.0	42.2 $\pm$ 0.2	0.0 $\pm$ 0.0
Acetate	24.3 $\pm$ 0.6	12.1 $\pm$ 1.5	0	25.4 $\pm$ 2.1	24.0 $\pm$ 2.6
	25.2 $\pm$ 0.3	12.6 $\pm$ 0.7	0.5	25.9 $\pm$ 0.5	17.6 $\pm$ 1.5
	23.7 $\pm$ 2.0	11.4 $\pm$ 2.0	1.0	25.2 $\pm$ 0.6	19.3 $\pm$ 0.7
	24.0 $\pm$ 0.8	10.6 $\pm$ 1.2	1.5	25.9 $\pm$ 0.7	16.0 $\pm$ 1.3
	24.7 $\pm$ 0.9	11.7 $\pm$ 1.3	2.0	26.6 $\pm$ 1.1	0.4 $\pm$ 1.9

^(a) H₂ concentration was measured in H₂/CO₂ assays.

Table S2. Ethanol and acetate concentrations measured at the beginning (t_0) and end (t_f) of P1 and P2, at increasing O_2 concentrations, in the assays with ethanol. Values are the average of triplicates $\pm$ standard deviation.

P1				P2				
[Eth] t_0 (mmol L ⁻¹)	[Eth] t_f (mmol L ⁻¹)	[Ac] t_0 (mmol L ⁻¹)	[Ac] t_f (mmol L ⁻¹)	O_2 (%)	[Eth] t_0 (mmol L ⁻¹)	[Eth] t_f (mmol L ⁻¹)	[Ac] t_0 (mmol L ⁻¹)	[Ac] t_f (mmol L ⁻¹)
26.6 $\pm$ 0.0	0.0 $\pm$ 0.0	0.1 $\pm$ 0.0	24.9 $\pm$ 0.2	0	27.7 $\pm$ 0.8	3.8 $\pm$ 1.9	24.3 $\pm$ 0.3	46.4 $\pm$ 0.9
26.1 $\pm$ 0.4	0.0 $\pm$ 0.0	0.1 $\pm$ 0.0	24.6 $\pm$ 0.4	0.5	27.4 $\pm$ 0.7	5.4 $\pm$ 0.4	23.9 $\pm$ 0.6	45.3 $\pm$ 2.0
26.1 $\pm$ 0.4	0.0 $\pm$ 0.0	0.1 $\pm$ 0.0	24.4 $\pm$ 0.1	1.0	26.9 $\pm$ 0.4	5.6 $\pm$ 0.7	23.7 $\pm$ 0.1	44.3 $\pm$ 0.7
25.7 $\pm$ 0.6	0.0 $\pm$ 0.0	0.1 $\pm$ 0.0	24.2 $\pm$ 0.5	2.5	27.4 $\pm$ 1.1	7.2 $\pm$ 1.2	23.6 $\pm$ 0.6	42.1 $\pm$ 1.1
26.2 $\pm$ 0.3	0.0 $\pm$ 0.0	0.1 $\pm$ 0.0	24.3 $\pm$ 0.2	5.0	27.7 $\pm$ 0.8	20.7 $\pm$ 0.4	24.0 $\pm$ 0.1	31.6 $\pm$ 0.8

Eth (Ethanol), Ac (Acetate)

