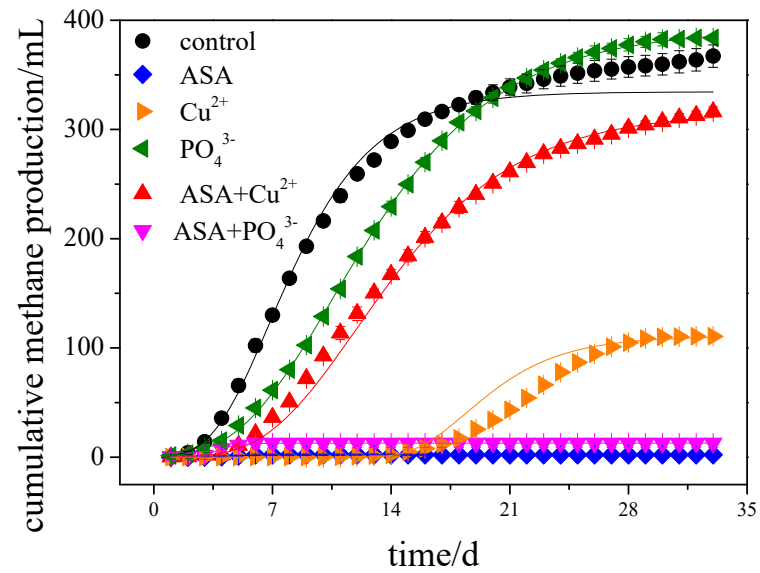
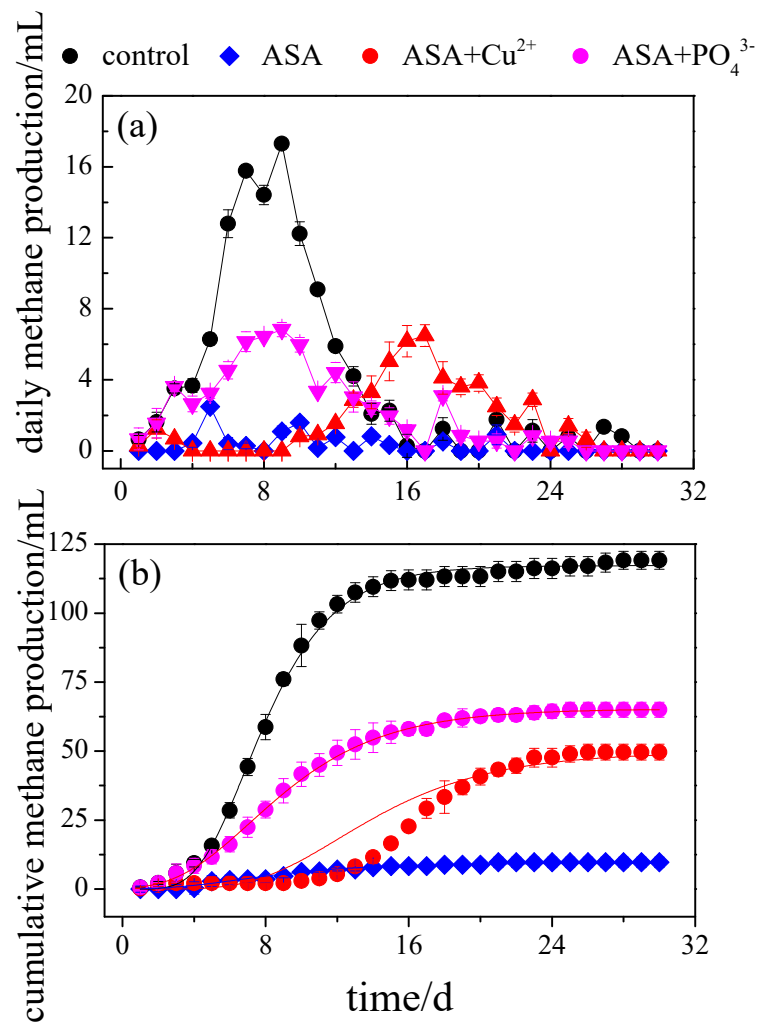


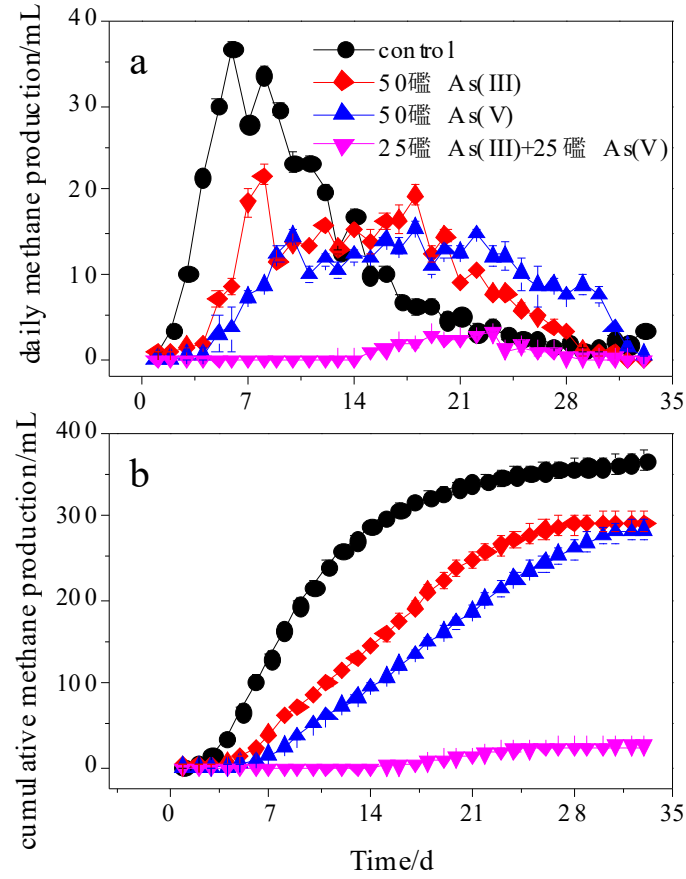
## Supplementary materials



**Fig. S1** Modeling of cumulative methane production using Gompertz equation using sucrose as substrate



**Fig. S2** Daily methane production (a) and Gompertz equation simulated cumulative methane production (b) using sucrose as substrate



**Fig. S3** Daily methane production (a) and cumulative methane production (b) using pig manure as substrate

**Table S1** Control experiments with As(III) and As(V)

Assays	Pig manure (g TS/L)	Sludge (mL)	As(III) (mM)	As(V) (mM)
1	9	50	–	–
2	9	50	50	–
3	9	50	–	50
4	9	50	50	50

Note: TS, total solid

**Table S2** Estimated parameters using Gompertz equation for methane production with sucrose as substrate

Group	Ion (2 mM)	ASA (mM)	CH <sub>4,max</sub> (mL)	$\lambda$ (d)	$R_{\max,CH_4}$ (mL/d)	$R^2$	Inhibition index (%)
1(control)	–	–	117.47	4.19	16.01	0.9983	–
2	–	0.46	9.34	2.62	0.88	0.9565	94.48
3	Cu <sup>2+</sup>	0.46	49.64	7.37	3.89	–	75.71
4	PO <sub>4</sub> <sup>3-</sup>	0.46	68.28	2.31	5.64	0.9991	63.96