

Table 1 Parameter estimation for energy model and surface aerator model.

Model Variables	Parameter	Inner lane	Middel lane	Outer lane
Energy	a_e	0.27	0.35	0.83
	ξ	240	320	330
	R^2	0.99	0.95	0.99
Aeration, OTR	a	90	130	110
	b	0.40	0.41	0.19
	R^2	0.84	0.87	0.73
Velocity, v	v_m	0.70	0.69	0.95
	K_h	0.09	0.05	0.34
	R^2	0.97	0.98	0.99

Figure S1 DO profiles along the outer-lane reactor

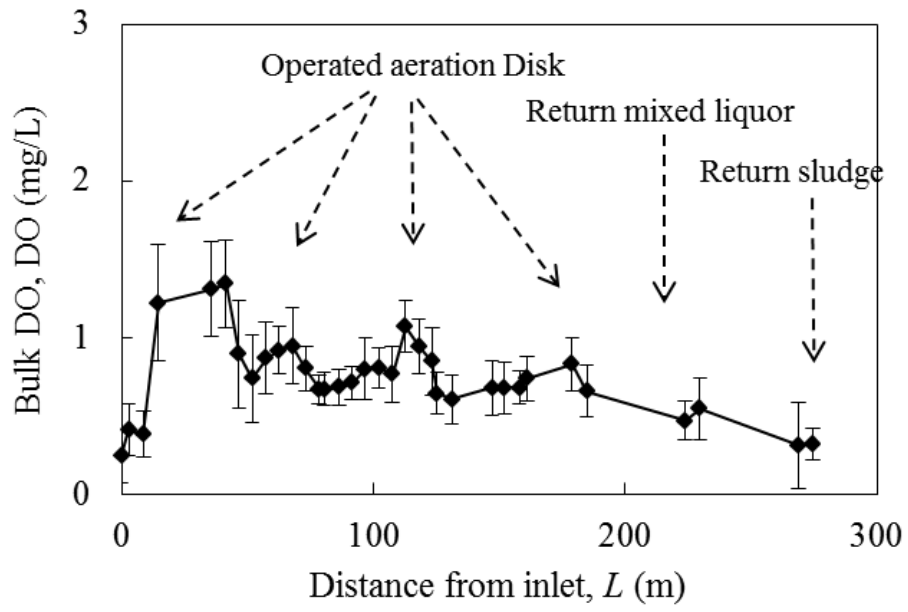


Figure S2 Profiles of OUR and ammonia along the reactor. OL, ML and IL mean the outer, middle and inner lane respectively. OL-1, OL-2 and OL-3 represent the three sampling sites evenly distributed along the OL, Which is the same for ML and IL. Eff represents the sampling site at the effluent weir. Error bars shows the standard deviation of OUR (n=10) and ammonia (n=3).

