

Table S3 The deviation derived from the different simulation time steps.

Time step: 1 day		Time step: 3 hours	
Daily reaction rate: r_d		3-hour reaction rate: $r_d/8$	
Time	Substrate concentration	Time	Substrate concentration
t_0	c_0	t_0	c_0
t_1 (1 day=24 hours)	$c_0(1 - r_d)$	t_1' (3 hours)	$c_0(1 - r_d/8)$
		t_2' (6 hours)	$c_0(1 - r_d/8)^2$
		t_3' (9 hours)	$c_0(1 - r_d/8)^3$
		t_4' (12 hours)	$c_0(1 - r_d/8)^4$
		t_5' (15 hours)	$c_0(1 - r_d/8)^5$
		t_6' (18 hours)	$c_0(1 - r_d/8)^6$
		t_7' (21 hours)	$c_0(1 - r_d/8)^7$
		t_8' (24 hours)	$c_0(1 - r_d/8)^8$

At the moment of 24 hours, the deviation between the simulated substrate concentration using daily and 3-hour time step: $[c_0(1 - r_d)] - [c_0(1 - r_d/8)^8]$, i.e., **$c_0[1 - r_d - (1 - r_d/8)^8]$**

c_0 denotes the initial concentration of a substrate.