

Symbol	Parameter	Value	Ref.
D_O	Oxygen diffusion coefficient	$1.53 \times 10^{-9} \text{ m}^2 \cdot \text{s}^{-1}$	[1]
D_N	Nitrite diffusion coefficient	$1.32 \times 10^{-9} \text{ m}^2 \cdot \text{s}^{-1}$	[4]
L	Biofilm thickness (constant)	$400 \mu\text{m}$	[3]
h_0	Characteristic length scale	$100 \mu\text{m}$	*
k_O	Oxygen reaction rate (first order)	1.02 s^{-1}	*
k_N	Nitrite reaction rate (first order)	4 s^{-1}	*
s_O^0	Bulk concentration of oxygen	$175 \mu\text{mol} \cdot \text{l}^{-1}$	[3]
s_N^0	Bulk concentration of nutrient	$5 \text{ mmol} \cdot \text{l}^{-1}$	[3]
t_0	Characteristic time scale	3600 s	*
η	Parameter controlling oxygen interactions	$\log 2 \mu\text{mol}^{-1} \cdot \text{l}$	*
μ_O	Specific growth rate consuming oxygen	$0.1/175 \text{ h}^{-1} \cdot (\mu\text{mol oxygen})^{-1} \cdot \text{l}$	*
μ_N	Specific growth rate consuming nitrite	$0.1/5 \text{ h}^{-1} \cdot (\text{mmol nitrite})^{-1} \cdot \text{l}$	*
ρ_R	mRNA density	$6 \text{ g} \cdot \text{l}^{-1}$	†

Table S3: Parameter values for Denitrification simulation. *: assumed, †: unpublished estimate, other references are listed in **Text S1**.