NOMENCLATURE

CHAPTER 1

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CHAPTER 2

q_e	amount of adsorbate adsorbed at equilibrium, (mg/g)
c_e	concentration of adsorbate in solution at equilibrium, (mg/l)
K_f	Freundlich isotherm constant, (mg/g) $(mg/l)^{1/n}$
n	constant in Freundlich isotherm, (-)
Q	maximum mass of adsorbate adsorbed as Langmuir isotherm, (mg/g)
b	constant in Langmuir isotherm, (l/mg)
K_1	constant in Redlich Peterson isotherm, (l/g)
K_2	constant in Redlich Peterson isotherm, $(l/mg)^m$
m	constant in Redlich Peterson isotherm, (-)
T	monolayer adsorption capacity parameter in Toth isotherm, (mg/g)
a	constant in Toth isotherm, $(mg/l)^{th}$
th	constant in Toth isotherm, (-)
K	constant in Radke Prausnitz isotherm, (l/g)
k	constant in Radke Prausnitz isotherm, $(mg/l)/(mg/l)^{1/p}$
p	constant in Radke-Prausnitz isotherm, (-)
a_1	constant in Fritz-Schlunder isotherm, (mg/g) / $(mg/l)^{\beta_1}$
a_2	constant in Fritz-Schlunder isotherm, (mg/g) / $(mg/l)^{\beta_1}$
b_1	constant in Fritz-Schlunder isotherm, (-)
b_2	constant in Fritz-Schlunder isotherm, (-)
μ	specific growth rate, (1/h)
μ_{max}	maximum specific growth rate, (1/h)
K_s	substrate concentration at half the value of $:_{max}$, (mg/l)
K_i	Haldane's growth kinetics inhibition coefficient, (mg/l)
E_{bg}	band Gap Energy, (eV)
λ_{min}	minimum Wavelength, (nm)

CHAPTER 3

T	absolute temperature, (K)
R	gas constant, (J/mol K)
K	Equilibrium constant used in Van't Hoff equation, (-)
ΔH	Enthalpy, (J/mol)
ΔG	Gibb's free energy, (J/mol)
ΔS	Entropy change, (J/mol K)
q_t	amount of adsorbate adsorbed at given time, (mg/g)
t	time, (min)
k_1	pseudo-first order rate constant for the sorption process, (min^{-1})
k_2	rate constant for second order sorption process, (l/mg. min)
h	initial sorption rate, (mg. min/g)
ε_b	fraction of volumetric space unoccupied by adsorbent, (-)
ρ_p	density of adsorbent particle, (kg/m^3)
D_e, D_i	effective diffusivity of adsorbate in solution, (m^2/s)
D_p	diffusivity of adsorbate in pores, (m^2/s)
D_s	diffusivity of adsorbate on surface, (m^2/s)
r	radius of adsorbent particle, (m)
F	fractional uptake of adsorbate on adsorbent, (-)
$\bar{q}$	average solid phase concentration, (mg/g)
n	integer, (-)
K, B	Time constant, (1/second)
D_o	pre-exponential factor for diffusion controlled process, (m^2/s)
E	activation energy, (J/mol)
$S^{\#}$	entropy of activation, (J/mol K)
k	Boltzman constant, (J/K)
h	Planck's constant, (J. Sec.)
d	distance between two successive exchange site, (°A)
C_o	initial concentration of adsorbate in solution, (mg/l)
C_t	concentration of adsorbate in solution at given time, (mg/l)
C_e	equilibrium concentration of adsorbate in solution, (mg/l)
V	volume of solution, (l)
M	mass of adsorbent, (g)

CHAPTER 4

S	substrate concentration, (mg/l)
E	enzyme concentration, (mg/l)
v	velocity of reaction, (1/h)
v_{max}	maximum velocity of an enzyme catalyzed reaction, (1/h)
K_m	Michaelis constant, (mg/l)
x	concentration of biomass, (mg/l)
Y	observed yield coefficient, (mg biomass/mg substrate)
k_d	endogenous decay coefficient, (1/h)
m	specific maintenance requirement, (-)
t	time, (h)

CHAPTER 5

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CHAPTER 6

z	thickness of biofilm, (cm)
W_e	weight of evaporated water, (g)
N	number of particles in the samples, (-)
r_p	radius of particle, (cm)
ρ_l	density of water, (g/ml)

CHAPTER 7

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CHAPTER 8

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