NOMENCLATURE

Latin letters		
a	interfacial specific surface area	$[m^2/m^3]$
A	cross section area	$[m^2]$
A_i, A*	physical solubility of chlorine	[kmol/m^3 or gmol/liter]
b_0, b_{ii} , b_{ij}	regression coefficients	[-]
C	concentration	[kmol/m^3 or gmol/liter]
C_{A0}	concentration of A bulk of liquid/ Initial concentration in gas	[kmol/m^3 or gmol/liter]
C_g	concentration of gas	[kmol/m^3 or gmol/liter]
C_{B0}	concentration of B in bulk of liquid/ Initial concentration	[kmol/m^3 or gmol/liter]
C_D	drag coefficient	[-]
C_{DN}	modified drag coefficient	[-]
d, D	diameter	[m]
d_{32}	Sauter bubble diameter	[m]
D_A	diffusion coefficient of species A in the liquid phase	$[m^2\ s^{-1}]$
G	volumetric flow rate of gas	[$m^3\ s^{-1}$ or litre/hr]
G'	molal flow rate	[moles/sec]
g	acceleration due to gravity	$[m\ s^{-2}]$
F	volumetric flow rate	$[m^3\ s^{-1}]$
H	Henry's law coefficient	$[Pa\ m^3\ mol^{-1}]$
Ha	Hatta number	[-]
R_A, N_A	rate of molar absorption with chemical reaction (flux)	$[mol\ m^{-2}\ s^{-1}]$
N_A*	average rate of physical absorption (flux)	$[mol\ m^{-2}\ s^{-1}]$
k_G	gas sided mass transfer coefficient	$[mol\ m^{-2}\ Pa^{-1}\ s^{-1}]$
k_L	liquid sided mass transfer coefficient	$[m\ s^{-1}]$
$k_{m,n}$	chemical reaction rate constant for m^{th} order in species A and n^{th} order in species B	$[m^{3(m+n-1)}\ mol^{-(m+n-1)}\ s^{-1}]$
k_La	volumetric mass transfer coefficient	$[s^{-1}]$

k_La^*	dimensionless k_La	[-]
l	length	[meter]
L	volumetric flow rate of liquid	[$m^3 s^{-1}$ or litre/hr]
M	molecular weight	[kg mol^{-1}]
m	number of moles	[-]
n	number of nozzles	[-]
P	system pressure	[Pa]
p_A	partial pressure of component A	[Pa]
r	radius	[m]
r_A	chemical reaction rate of species A (volumetric)	[mol $m^{-3} s^{-1}$]
R	gas constant	[J K^{-1} mol^{-1}]
t	time	[s]
t_e	exposure time	[s]
T	temperature	[K]
V	volume	[m^3]
v	velocity	[m s^{-1}]
V_R, V_J	volume of reactor/ejector	[m^3]
w_i	concentration of species *i* in the liquid phase	[kmol/m^3]
w_{ij}	concentration of species *i* in the liquid phase at x_j	[m s^{-1}]
x	distance from interface	[m]
x_j	spatial variable at node j	[m]
X	influencing parameter, dimensionless	[-]
Y	target quantity, dimensionless	[-]
y	mole percentage of solute in gas	[-]
z	stoichiometric coefficient	[-]
Z	distance along axis of ejector	[-]
N	normality	

Greek letters

α	gas hold up	[-]
β	enhancement factor	[-]
Δ	difference	[-]

δ	film thickness	[m]
χ_1	liquid holdup	[-]
k	exponent	[-]
σ	parameter defined by equation (4.2.13)	[-]
σ_1, σ_2	parameter defined by equation (4.2.15) & (4.2.16)	[-]
σ	surface tension	[N m^{-1}]
μ_k	kinematic viscosity	[cm2/sec]
μ	dynamic viscosity	[Pa s]
ν	kinematic viscosity	[m^2 s^{-1}]
ρ	homogeneous flow model density	[kg m^{-3}]

Subscripts

0	fluid bulk
A,B....	component A,B.....
b	bubble
disp	Dispersion
e	exposure
G, g	gas phase
i	interface
in	inlet
j	jet
L, l	liquid phase
m, n	chemical reaction order
N	nozzle
M	mixing tube
out	outlet
th	throat
tot	total
d	desorption
b	bubble
s	superficial
R	reactor
mo	molal

Superscripts

O	fluid bulk/initial
*	equilibrium, physical solubility
’	solute free basis