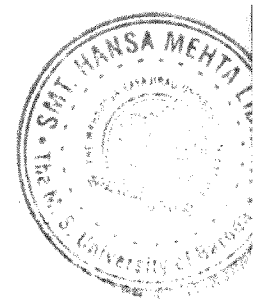
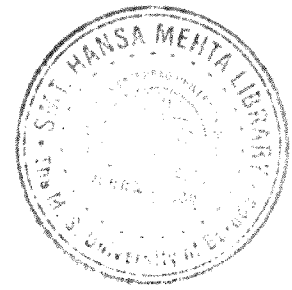


NOTATIONS



NOTATION

$\%A_E$ = % aromatics extracted

a = interfacial area per unit volume of contactor, L^2/L^3, L^{-1}

a_t = surface area of packing per unit, L^2/L^3, L^{-1}

d_v = packing size, L

d_T =tower diameter, L

d_{us} = Sautermean diameter of droplets, L

d_{us}^{o} =characteristic droplet diameter, L

D = diffusivity of solute, L^2T^{-1}

E = solubility of solute in the phase in which it is transferred, ML^{-3}

G =flow rate $MT^{-1}L^{-2}$

g = gravitational constant, LT^{-2}

HTU = height of transfer unit, L

H_B = Concentration of solute in the extract phase expressed as gm. of solute per gm. of solvent in the extract phase.

H'_B = Concentration of solute in raffinate phase, expressed as gm. of solute per gm. of non-solute in the raffinate phase.

H^*_B = Equilibrium value of Concentration of solute in the extract phase expressed as gm. of solute per gm. of solvent in the extract phase.

H'_B* = Equilibrium value of Concentration of solute in raffinate phase, expressed as gm. of solute per gm. of non-solute in the raffinate phase.

k_c=individual continuous phase mass transfer coefficient LT^{-1}

k_d = individual dispersed phase mass transfer coefficient, LT^{-1}

$k^{!}$ = Pseudo-first order reaction rate constant, T^{-1}

K_L = mass transfer coefficient in the phase where reaction is taking place39, LT^{-1}

$K_{oc}a$ = overall volumetric mass transfer coefficient based on continuous phase, T^{-1}

$K_{od}a$ = overall volumetric mass transfer coefficient based on dispersed phase, T^{-1}

L = ratio of dispersed phase to continuous phase velocities, V_d/V_c

m = slope of the equilibrium line

N.T.U.= Number of transfer units

NSc = Schemidt number, $\mu/(p\ D)$

$\%\ P_E$=% purity of extract

R = specific rate of extraction, $ML^{-2}\ T^{-1}$

$R_{cd}^{!}$ = characteristic Reynolds number of dispersed phase

S/F=solvent to feed ratio, by wt. or by vol.

V = superfacial velocity of the phase, LT^{-1}

Vo = characteristic velocity, LT^{-1}

V_s = slip velocity, LT^{-1}

V_t = terminal velocity of liquid drops, LT^{-1}

W_e = modified Weber number

X = fractional hold-up of dispersed phase

GREEK LETTERS

O = contact time T

γ = interfacial tension, FL^{-1}

ε = fractional voidage of column

μ = viscosity, $ML^{-1}T^{-1}$

p = density, ML^{-3}

Δp = density difference, ML^{-3}

σ = surface tension, FL^{-1}

σcr =critical surface tension

SUBSCRIPTS

c = continuous phase

d = dispersed phase

f = flooding conditions

o = overall

s = fluid which does not wet the packing preferentially

w = fluid which preferentially wets the packing

1=based on Vd

2= based on Vd+Vc

SPECIFIC NOTATIONS

Various constants

K, n = Constants in Hand's correlation.

K_c' n_c = Constants in Campbell's correlation.

k_B , ^nB = Constants in Batchman's correlation.

$k_{0.T.}$ $^n{}_{0.T.}$ = Constants in Othmer and Tobia

(ii) Composition on Weight Basis :-

X HE =Wt..fraction of Hexane Extract

X HR = Wt..fraction of Hexane Raffinate

X SE = Wt..fraction of Solvent Extract

X SR = Wt..fraction of Solvent Raffinate

XBE =Wt. Fraction of Benzene in extract

XBR=Wt. Fraction of Benzene in raffinate

XD'E+WE=Wt. Fraction of Dmso+Water in extract

XD'R+WR=Wt. Fraction of Dmso+Water in raffinate

XD'E+WE= wt. fraction of dmso+water in extract

XDE+WE=Wt. Fraction of Dmf+Water in extract

XDR+WR=Wt. Fraction of Dmf+Water in raffinate

XH'E=Wt. Fraction of Heptane in extract

XH'R= wt. fraction of Heptane raffinate

(iii) Flow rates in Packed column operation:

Vci= continuous phase flow rate in let, LT^{-1}

Vco= continuous phase flow rate out let, LT^{-1}

Vdi= dispersed phase flow rate in let, LT^{-1}

Vdo= dispersed phase flow rate out let, LT^{-1}

Vcavg= Average continuous phase flow rate LT^{-1}

Vdavg g= Average dispersed phase flow rate LT^{-1}

R.IE= Refractive Index Extract phase.

R.IR= Refractive Index raffinate. phase.

(iv) For Packed column internals .

I.D=. inside diameter of Packing cm

O.D=. out side diameter of Packing cm

L = Length of one Packing. cm

dp = diameter of Packing . cm

dc= diameter of column cm

(v) Abbreviations for Chemicals

A= aromatics

Dmf = dimethyl formamide

Dmso = dimethyl sulfoxide

DEG = diethylene glycol

TEG = triethylene glycol

H-Hexane, T=Toluene X=Xylene

H'=Heptane, O=Octane,