j_h = Chilton-Colburn heat transfer factor defined by Equation 1
j_m = Chilton-Colburn mass transfer factor defined by Equation 2
k = thermal conductivity, cal./(sec.)(cm.)(° C.)
K = mass transfer coefficient, grams/(sec.) (sq. cm.) (unit concn. change in grams/cc.)
L = heat of fusion, cal./gram
m = constant
M = weight of liquid, grams
n = rotational speed of stirrer, r. p. s.
Q = total heat transferred, cal.
Re = Reynolds number = $(d_p u\rho/\mu)$ for pipes or $(nd^2\rho/\mu)$ for agitation systems
T = temperature, ° C.
T_0 = initial temperature, ° C.
T_p = melting point of solid, ° C.
u = fluid velocity, cm./sec.
V = volume of liquid, cc.
W = weight of undissolved solid at time θ, grams
W_0 = initial weight of solid, grams
W_s = weight of solid required for saturation, grams
X_h = effective film thickness for heat transfer, cm.
X_m = effective film thickness for mass transfer, cm.
α, β, γ = constants
Δ = temperature difference at time θ, ° C.
Δ_m = log mean temperature difference, ° C.
Δ_0 = initial temperature difference, ° C.
Δ_c = concentration driving force = $(C_s - C)$, grams/cc.
Δ_{cm} = log mean concentration driving force, grams/cc.
Δ_{c0} = initial concentration driving force, grams/cc.
Φ, Φ' = mathematical symbols representing "function of"
ρ = density of liquid, grams/cc.
θ = time, sec.
μ = viscosity of bulk fluid, grams/(sec.)(cm.)
μ_f = av. viscosity of film, grams/(sec.)(cm.)

Literature Cited

(1) Arnold, J. H., *Physics*, **4**, 255 (1933).
(2) Chilton, T. H., and Colburn, A. P., IND. ENG. CHEM., **26**, 1183 (1934).
(3) Colburn, A. P., *Ibid.*, **22**, 967 (1930).
(4) Colburn, A. P., *Trans. Am. Inst. Chem. Engrs.*, **29**, 174 (1933).
(5) Gilliland, E. R., and Sherwood, T. K., IND. ENG. CHEM., **26**, 516 (1934).
(6) Hixson, A. W., and Baum, S. J., *Ibid.*, **33**, 478 (1941).
(7) King, C. V., and Howard, P. L., *Ibid.*, **29**, 75 (1937).
(8) McAdams, W. H., "Heat Transmission", p. 169, New York, McGraw-Hill Book Co., 1934.
(9) Prandtl, L., *Z. Physik*, **11**, 1072 (1910).
(10) Sherwood, T. K., "Absorption and Extraction", pp. 32, 37, New York, McGraw-Hill Book Co., 1937.
(11) Shiba, *Sci. Papers Inst. Phys. Chem. Research* (Tokyo), **16**, 205 (1931).
(12) Smith, J. F. D., IND. ENG. CHEM., **22**, 1246 (1930).
(13) Stanton, T. E., *Trans. Roy. Soc.* (London), **A190**, 67 (1897).
(14) Wilderman, M., *Brit. Assoc. Advancement Sci. Rept.*, **1896**, 751; *Phil. Mag.*, [6] **2**, 50 (1901); [6] **4**, 271, 468 (1902).

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Note particularly the differences between the several stills shown and those which appear in almost all of Teniers' alchemical paintings, representing a difference of about fifty years.

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