SYSTEM –

2Butanol & 1,3,5TrimethylBenzene

Activity Coefficient Model –

Wilson

Type of Equation	Parameters	$\ln \gamma_1$ = $\ln \gamma_2$ =	Notation of Parameters in Data Sheet
Wilson [8]	$\lambda_{12} - \lambda_{11}$ [1]	$-\ln (x_1 + \Lambda_{12} x_2) + x_2 \left(\frac{\Lambda_{12}}{x_1 + \Lambda_{12} x_2} - \frac{\Lambda_{21}}{\Lambda_{21} x_1 + x_2} \right)$ (30a)	A 12
	$\lambda_{21} - \lambda_{22}$	$-\ln (x_2 + \Lambda_{21} x_1) - x_1 \left(\frac{\Lambda_{12}}{x_1 + \Lambda_{12} x_2} - \frac{\Lambda_{21}}{\Lambda_{21} x_1 + x_2} \right)$ (30b)	A 21

1) $\Lambda_{12} = \frac{V_2^L}{V_1^L} \exp - \frac{\lambda_{12} - \lambda_{11}}{RT}$ $\Lambda_{21} = \frac{V_1^L}{V_2^L} \exp - \frac{\lambda_{21} - \lambda_{22}}{RT}$

V_i^L molar volume of pure liquid component i. For values of V_i^L see Appendix A.

λ_{ij} interaction energy between components i and j $\lambda_{ij} = \lambda_{ji}$

Parameters are given in cal/mol with the gas.

2. Antoine Vapor Pressure Equation

The Antoine vapor pressure equation is used in the following form:

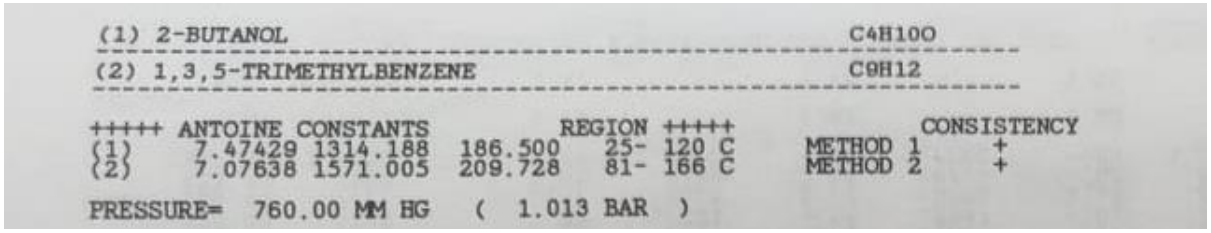
$$\log[p_i^0] = A - \frac{B}{t + C} \qquad (70)$$

with $[p_i^0]$ vapor pressure of pure component i in mm Hg
t temperature in degrees Celsius (° C)

The Antoine constants A, B, and C are given with respective temperature regions (in ° C).

Note- Here it is log (Base 10).

Value of Constants

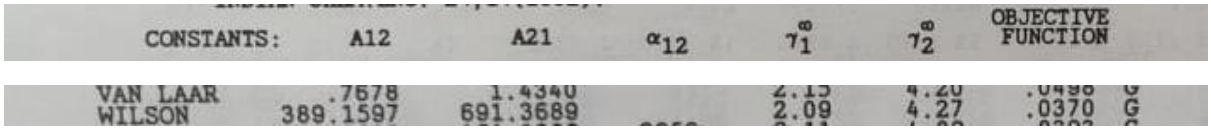


(1) 2-BUTANOL C4H10O

(2) 1,3,5-TRIMETHYLBENZENE C9H12

+++++ ANTOINE CONSTANTS			REGION +++++		CONSISTENCY
(1)	7.47429	1314.188	186.500	25- 120 C	METHOD 1 +
(2)	7.07638	1571.005	209.728	81- 166 C	METHOD 2 +

PRESSURE= 760.00 MM HG (1.013 BAR)

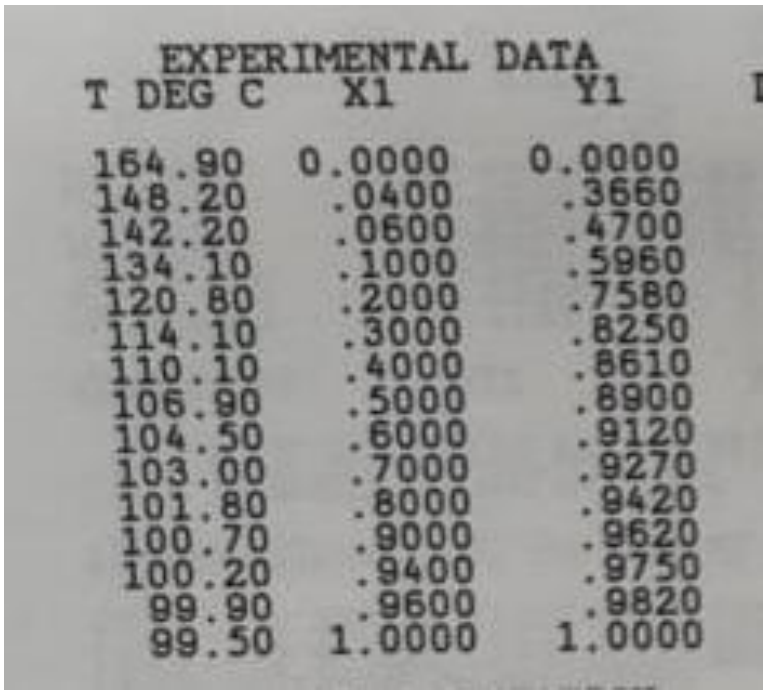


CONSTANTS:	A12	A21	α_{12}	γ_1^∞	γ_2^∞	OBJECTIVE FUNCTION
VAN LAAR	.7678	1.4340		2.15	4.20	.0498 G
WILSON	389.1597	691.3689		2.09	4.27	.0370 G

Please take data corresponding to Wilson

There is no alpha12 for Wilson.

T-X-Y Data



EXPERIMENTAL DATA

T DEG C	X1	Y1
164.90	0.0000	0.0000
148.20	.0400	.3660
142.20	.0600	.4700
134.10	.1000	.5960
120.80	.2000	.7580
114.10	.3000	.8250
110.10	.4000	.8610
106.90	.5000	.8900
104.50	.6000	.9120
103.00	.7000	.9270
101.80	.8000	.9420
100.70	.9000	.9620
100.20	.9400	.9750
99.90	.9600	.9820
99.50	1.0000	1.0000

Take the molar volume from NIST Database. If not available there, please contact the TA's (Sandra and Krishna).

All data taken from Dechema Chemistry Data Series.