Unit 10 - Week 8: Models for Activity Coefficients using Excess Gibbs Energy

Assessment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-25, 23:59 IST.

1) The van Laar constant A and B for the system of nitromethane (1) and CCl_4 (2) at 45°C are 2.230 and 1.959 respectively. Calculate the ratio between activity coefficients of nitromethane and carbon tetrachloride in the solution containing 30 mol % nitromethane. ***4 points***

- 1.068
- 5.876
- 4.514
- 2.218

No, the answer is incorrect.
Score: 0

Accepted Answers:
2.218

2) Wilson's parameters Λ_{12} and Λ_{21} for a system of nitromethane and carbon tetrachloride at 45°C are 0.1156 and 0.2879 respectively. Calculate the activity coefficients of nitromethane in solution if $x_1 = 0.3$. ***4 points***

- 2.513
- 4.219
- 1.053
- 3.894

No, the answer is incorrect.
Score: 0

Accepted Answers:
2.513

3) Wilson's parameters Λ_{12} and Λ_{21} for a system of nitromethane and carbon tetrachloride at 45°C are 0.1156 and 0.2879 respectively. Calculate the activity coefficients of CCl_4 in solution if $x_1 = 0.3$. ***4 points***

- 3.741
- 2.796
- 4.643
- 1.296

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.296

4) For a binary solution if g^E is given as $\frac{g^E}{RT} = x_1 x_2[A + B(x_1 - x_2)]$ then what is $\ln\left(\frac{\gamma_1}{\gamma_2}\right)$ =? ***6 points***

- $\frac{(A-3B)x_1^2-4Bx_1^3}{(A+3B)x_2^2+4Bx_2^3}$
- $\frac{(A+3B)x_1^2+4Bx_1^3}{(A-3B)x_2^2-4Bx_2^3}$
- $\frac{(A+3B)x_2^2-4Bx_2^3}{(A-3B)x_1^2+4Bx_1^3}$
- $\frac{(A-3B)x_2^2-4Bx_2^3}{(A+3B)x_1^2+4Bx_1^3}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{(A+3B)x_2^2-4Bx_2^3}{(A-3B)x_1^2+4Bx_1^3}$

5) In a binary mixture the activity coefficient of component "1" is given by: $R\ln\gamma_1 = Ax_2^2 + Bx_2^3$ .This equation is valid in the entire range of composition. What is the activity of component "2"? ***6 points***

- $R\ln\gamma_2 = \left(\frac{3A+2B}{2}\right)x_1^2 - Bx_1^3$
- $R\ln\gamma_2 = \left(\frac{2A+3B}{2}\right)x_1^2 - Bx_1^3$
- $R\ln\gamma_2 = \left(\frac{2A+3B}{2}\right)x_1^2 + Bx_1^3$
- $R\ln\gamma_2 = \left(\frac{2A-3B}{2}\right)x_1^2 - Bx_1^3$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$R\ln\gamma_2 = \left(\frac{2A+3B}{2}\right)x_1^2 - Bx_1^3$

6) For an isothermal binary solution, the activity coefficients are given as $\gamma_1 = 1 + Ax_2$ and $\gamma_2 = 1 + Bx_1$. Are these relations reliable? ***6 points***

- Yes
- No
- Data insufficient to judge
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
No