

**UNIVERSITY CEU SAN PABLO
SCHOOL OF PHARMACY
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY**

PROBLEMS OF PHYSICAL CHEMISTRY

2018-2019

LESSON 4

10. The vapour pressures at 7 °C of pure A and B are 100 and 1000 mmHg respectively. For an ideal solution formed by A and B in equimolar quantities and 27 °C want to know:

- a) the vapour pressure of the solution
- b) vapour composition

Data: $\Delta \bar{H}_{\text{vap,A}} = 400 \text{ cal} \cdot \text{mol}^{-1}$; $\Delta \bar{H}_{\text{vap,B}} = 280 \text{ cal} \cdot \text{mol}^{-1}$

$$R = 0.082 \text{ l} \cdot \text{atm} \cdot \text{K}^{-1} \cdot \text{mol}^{-1} = 1.987 \text{ cal} \cdot \text{K}^{-1} \cdot \text{mol}^{-1} = 8.314 \text{ J} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$$

11. The following table show the values of solutions of acetone-chloroform at 32.5 ° C.

$x^{\text{liq}}_{\text{(HCCl}_3\text{)}}$	$P_{\text{(HCCl}_3\text{)}} / (\text{mm Hg})$	$P_{\text{(C}_3\text{H}_6\text{O)}} / (\text{mmHg})$
0.000	-	344.5
0.059	9.200	323.2
0.080	12.700	-
0.100	16.200	-
0.123	20.400	299.3
0.185	31.9	275.4

Calculate for a solution of $x_{\text{HCCl}_3}^{\text{L}} = 0.123$ at 32.5 °C:

- a) The activity coefficients of acetone and chloroform according to convention I
- b) The activity coefficients of acetone and chloroform according to convention II, considering acetone the solvent

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