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 ºC 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 oC want to know:

a) the vapour pressure of the solution

b) vapour composition

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

R = 0.082 l·atm·K^{-1}·mol^{-1} = 1.987 cal·K^{-1}·mol^{-1} = 8.314 J·K^{-1}·mol^{-1}

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

$x^{liq}_{(HCCl3)}$	**P $_{(HCCl3)}$ / (mm Hg)**	**P $_{(C3H6O)}$ / (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 $x^{L}_{HCCL_3}$ = 0.123 at 32.5 ^{o}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.

Data: P^{*}_{HCCl3}(35 ^{o}C) = 295.1 mm Hg; $\Delta\overline{H}_{V,HCCl3}$ = 7500 cal·mol^{1} M $_{chloroform}$ = 118.5 g·mol^{-1}; M $_{acetone}$ = 58 g·mol^{-1}.

R = 0.082 l·atm·K^{-1}·mol^{-1} = 1.987 cal·K^{-1}·mol^{-1} = 8.314 J·K^{-1}·mol^{-1}

12.- Calculate the mean ionic activity of a 0.001 molal aqueous solution of magnesium nitrate

Datos: A = 0.509