Assignment problems II

- **P5.5** What volumes of ethanol and water should be mixed to produce 100 cm³ of mixture containing 50% by mass of ethanol. What change in volume is brought about by adding 1 cm³ of ethanol to the mixture. Take data from the graph in Fig. 5.1.

  8 points

- **P5.9** Plot the vapour pressure data for a mixture of benzene ("B") and acetic acid ("A") (take figure 5.16 as an example). Confirm that Raoult's and Henry's laws are obeyed in the appropriate regions. Deduce the activity and activity coefficients on the Raoult's law basis and taking B as a solute activity and activity coefficients on a Henry's law basis. Evaluate Gibbs energy of mixture over the composition range spanned by the data.

  12 points

x_A	0.016	0.0439	0.0835	0.1138	0.1714	0.2973	0.3696	0.5834	0.6604	0.8437	0.9931
p_A/kPa	0.484	0.967	1.535	1.89	2.45	3.31	3.83	4.84	5.36	6.76	7.29
p_B/kPa	35.05	34.29	33.28	32.64	30.90	28.16	26.08	20.42	18.01	10.0	0.47

Use Excel (or other graphing software of your choice) to perform fit in the problem P5.9