Chapter 7 Answers

1. Brush up on your calculus, differentiate the expression with respect to x_{A}, put this expression equal to zero, and solve for x_{A}. You'll find it is 0.5. Do it.

2. $\Delta_{mix}G = -1668.4\,\mathrm{J}$.

3. The chemical potential of A is 7979.5 J less in the solution than it would be in an ideal 1 molal solution.

4. In an ideal gas solution, the volume % is proportional to the number of moles of gas, or to the mole fractions. Therefore the mole fraction of each gas is its volume % divided by 100. This also equals its fugacity and partial pressure in bar.

5. At 100 bar, $f_{\mathrm{CH_4}} = 1.7 \times 10^{-4}$ bar.

6. $f_{\mathrm{CH_4}} = 1.615 \times 10^{-4}$ bar.

7. See spreadsheet HenrysLaw.xls.