Chemistry 311

Physical Chemistry

Homework Assignment # 7

Due: Wednesday, November 1, 2004

1. Prior to the discovery that Freon-12 (CF_2Cl_2) was harmful to the Earth's ozone layer, it was frequently used as the dispersing agent in spray cans for hair spray, etc.. Its enthalpy of vaporization at its normal boiling point of –29.2 °C is 20.25 kJ mol^{-1}. Estimate the minimum pressure a can of hair spray with Freon-12 had to withstand at 40 °C, the temperature of a can that has been standing in sunlight on a mild day. Assume that $\Delta_{vap}H°$ is constant over the temperature range considered.

2. The vapor pressure of pure liquid A at 300 K is 575 torr, and that of pure liquid B is 390 torr. The two liquids form an ideal mixture in which the mole fraction of A in the liquid phase is 0.350. Calculate (a) the total pressure of the vapor and (b) the composition of the vapor phase, assuming that no other gases are present.