Answer on Question #79419, Chemistry/General Chemistry

The vapor pressure of methanol (CH3OH) at 25°C is 126 mmHg.

Kp= 0.166

Calculate the value of ΔG^o

Solution

The equilibrium that takes place is:

CH3OH(l) = CH3OH(g)

At equilibrium ΔG=0

$G_{gas} - G_{liq}=0$

$[G_{gas}^o + RT\ln(p/p_o)] - G_{liq} = 0$

$G_{gas}^o - G_{liq} = -RT\ln(p/p_o)$

$\Delta G^o = - RT\ln(p/p_o)$

$\Delta G^o = - 8.314\ J/mol\ K \times 398\ K \times \ln(126\ mmHg/760\ mmHg) = 4452\ J/mol$

Answer: 4452 J/mol