

Please show all equations, all work, all calculations, and explain fully to receive credit

1. For mercury at a temperature of 310 K, calculate the:
 - a. Enthalpy of vaporization

 - b. Entropy of vaporization.

 - c. Change in Gibbs Free Energy at 310 K. Explain what your answer to this question makes sense.

2. Find the vapor pressure, in atmospheres, of mercury at a temperature 310K.

3. Atmospheric mercury concentrations measured in the Great Lakes region were found to be near 2.5×10^{-7} atm of Hg. Calculate the surface water mercury concentration (in units of molarity, M) that would be in equilibrium with atmospheric mercury vapor at this partial pressure. Using EPA's on-line tools for assessment, the Henry's Law constant for elemental mercury at 310 K was found to be 0.325 M / atm.