

Problem Set 4

Due date: November 5, 2007

Problem 13)

The following vapor-pressure data were obtained for Neon:

Temperature / °C	-228.7	-233.6	-240.2	-243.7	-245.7	-247.3	-248.5
Pressure / Torr	19800	10040	3170	1435	816	486	325

Determine the enthalpy and entropy of vaporization for Neon.
(3 points)

Problem 14)

1-Methyl naphthalene melts at -22.0 °C . If the vapor pressure of the liquid is 9.93 Torr at 86.1 °C , and 36.20 Torr at 119.7 °C , use the *Clausius-Clapeyron* equation to calculate a) the enthalpy of vaporization, b) the normal boiling point, and c) the entropy of vaporization at the normal boiling point.

(4 points)

Problem 15)

The boiling point of benzene at standard pressure is 80.1 °C , and furthermore, benzene follows *Trouton's rule*. Estimate a) its enthalpy of vaporization and b) its vapor pressure at 25.0 °C and 70.0 °C .

(3 points)

Problem 16)

The contact angle for water at a clean glass surface is close to zero. Calculate the surface tension of water at 25.0 °C given that at that temperature water climbs to a height of 5.02 cm in a clean glass capillary tube of 0.290 mm diameter. The density of water at 25.0 °C is 0.997 g/cm^3 .

(2 points)