20.110/2.772/5.601 Fall 2005
Recitation #5
9/27/2005

1. (SAB 3.16)
A flask containing several moles of acetic acid (CH_3CO_2H) at 16.6 °C (its melting point) is lowered into an ice water bath briefly. When it is removed, it is found that exactly 1 mol of acetic acid has frozen.
Given: $\Delta_{fus}H(CH_3CO_2H) = 11.45$ kJ/mol, $\Delta_{fus}H(H_2O) = 5.98$ kJ/mol
a) What is the change in entropy of the acetic acid?
b) What is the change in entropy of the water bath?
c) Now consider that the water bath and acetic acid are in the same system. What is the entropy change for the combine system? Is the process reversible or irreversible? Why?

2. (SAB 3.23)
Steam is condensed at 100 °C and the water is cooled to 0 °C and frozen to ice. What is the molar entropy change of the water? Consider that the average specific heat of liquid water is 4.2 J K^{-1} g^{-1}. The heat of vaporization at the boiling point and the heat of fusion at the freezing point are 2258.1 and 33.5 J/g, respectively.

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Recitation # 6
9/29/2005

1. (SAB 4.12) An ideal gas is allowed to expand irreversibly and isothermally (25 °C) from a pressure of 1 bar to a pressure of of 0.1 bar.
   a) What is the change in molar Gibbs energy?
   b) What would be the change in molar Gibbs energy if the process occurred reversibly?

2. (SAB 4.14) Helium is compressed isothermally and reversibly at 100 °C from a pressure of 2 to 10 bar. Calculate:
   a) q per mole
   b) w per mole
   c) _G
   d) _A
   e) _H
   f) _U
   g) _S