

Homework Assignment #5: Chapter 3

Name: _____
(Print and Pledged)

Purpose for homework: To practice your skills and knowledge of the second law of thermo

Instructions: Answer the following questions fully and completing showing necessary equations and diagrams. Feel free to work together but turn in your own work.

Work the following exercises from your pchem text AND explain WHY you used which formula: (The explanations will help you to learn/remember the formulas and under which conditions you should use them.)

If you work the problems in the order given, it helps build you from less difficult to more difficult problems...

Exercise 3.15a

3.7a

Exercise A: A Sample of perfect gas that initially occupies 15.0 L at 250 K and 1.00 atm is compressed isothermally. To what volume must the gas be compressed to reduce its entropy by 5.0 J/K?

Exercise B: A Sample of aluminum of mass 1.75 kg is cooled at constant pressure from 300 K to 265 K. Calculate (a) the energy that must be removed as heat and (b) the change in entropy of the sample. (Hint: You need the specific heat of aluminum.)

Exercise C: Calculate the change in entropy when 50 g of water at 80 oC is poured into 100 g of water at 10 oC in an insulated vessel given that $C_{p,m} = 75.5 \text{ J/(K}\cdot\text{mol)}$. (Hint: Watch your units carefully to avoid making mistakes. Cancelling variables before plugging in numbers is also helpful.)

Exercise 3.3a (The answer I obtained was a teeny bit off from the answer in the back of the book.)

Exercise 3.4a

Exercise 3.6a