HW6 Tips

Multiple Choice

* Problem 6-5 is the only problem with just one answer. The rest have multiple correct answers. Some are conditionally correct, so make a note about when those answers are true.

Problem 1

* If we assume the aluminum is incompressible (decent assumption for solids and single-phase liquids), over relatively small temperature changes it is usually safe to assume that the change in specific internal energy can be approximated with the equation
*du = cdT*
* For the value of specific heat, look it up at the average temperature.
* Calculate u over the temperature difference

Problem 2

* Because this is a ratio using the Ideal Gas EOS, R will divide out. And since it is rigid and sealed this means specific volume will not change, and v will also divide out. This leaves the governing equation as p2/p1 = T2/T1
* You can find the change in specific internal energy using *du = c­vdT*, and the change of specific enthalpy using *dh = c­pdT*. But you need to know the value of cv and cp for helium. Do remember that for inert gases there is an equation to calculate cp, and once you know that you can use R to find cv.

Problem 3

* You can use the form of the Ideal Gas Law of: p\**v* = R\*T. A little algebra gets you
*v* = R\*T/p 🡨 You’re going to need to use both absolute temperature and absolute pressure in this equation. But remember that R is not the same as Ru. R is the gas-specific gas constant, so you’ll need to use R­­propane, which you can find in your tables (C13).
* The Clausius EOS equation is given in the slides (and textbook) and just adds a ‘b’ term to Ideal Gas Law. You can find ‘b’ in Table C.15a (top table of page 52 of your supplement).
* Calculating specific volume two different ways will give you two different answers. In this case, they’re pretty different. Which is more correct?