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Physics 2C, Winter 2020

Reading Assignment due Tuesday 1/21: Submit via Gradescope by 11:30am

1. Uranium hexaflouride (UF_6) has a triple point at $(T, p) = (337 \text{ K}, 152 \text{ kPa})$. Suppose you have a (gaseous) sample of UF_6 at atmospheric pressure and room temperature. If you keep cooling your sample, will it undergo a phase transition from gas $\rightarrow$ liquid or from gas $\rightarrow$ solid?

2. Refer to Figure 18.9(a) in the textbook. Suppose you have an ideal gas initially at pressure p_0 in a container with volume V_0. A piston moves very slowly to expand the size of the container to a volume $2V_0$ and you find the pressure decreases to $2p_0/5$.

   (a) Draw the initial and final points on a pV diagram.

   (b) Assuming the gas is initially at a temperature of 340 K, what is the final temperature?

   (c) Now suppose instead of moving the piston slowly, a membrane suddnly bursts to make the container double in size. Can you represent that transition on a pV diagram?

3. The pV diagram below shows an ideal gas undergoing three processes $A \rightarrow B \rightarrow C \rightarrow A$. For each of the following, what type of process is it? What state variable is held constant? How do you know?
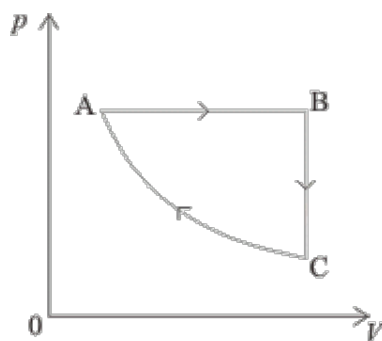
   (a) $A \rightarrow B$
   (b) $B \rightarrow C$
   (c) $C \rightarrow A$

For extra practice (not due): From Chapter 18 of Knight, 4th edition: Conceptual Questions: 3, 7-12. Exercises: 15-18, 21, 24, 26, 31-32, 34, 36, 39-40.