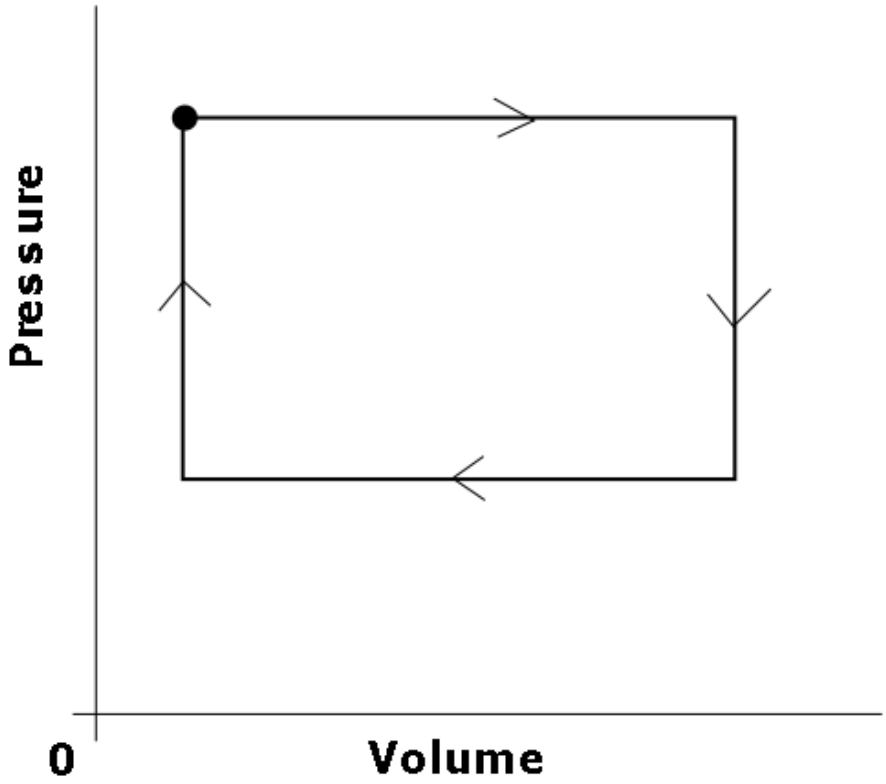
Using pV plots

We'll begin the day by looking at processes that happen at constant pressure, volume, temperature or entropy. This touches on the name-the-experiment discussion we had yesterday.



We talked about measurements such as

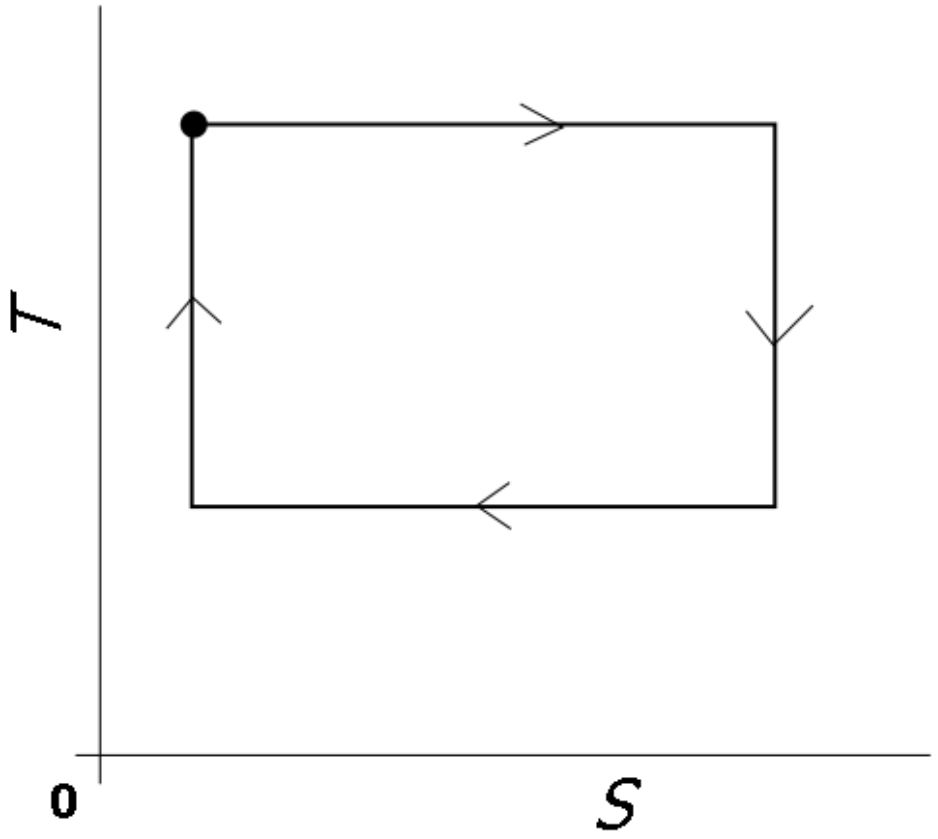
$$\left(\frac{\partial \tau}{\partial L}\right)_S$$

$$\left(\frac{\partial L}{\partial T}\right)_\tau$$

In these measurements, we measure how a state variable changes as we vary another one. Another sort of measurement involves *integrals* rather than derivatives, and measures finite changes. To discuss this, it's common to use what are called pV diagrams. For instance, consider the diagram above.

In your groups, work out the following questions:

1. What does this describe? Is p a function of V?
2. What is the net work done after one cycle of this process? How much work was done at each step?
3. What is the net heat transfer over one cycle of this process? For each step?



Now let's look at another cycle. Let's consider the figure above, which looks similar but is a plot of T vs. S, and answer the following questions.

1. What is this cycle? How would you go about running a cycle like this?
2. What is the net heat transfer over one cycle of this process? How much was transfered on each step?
3. What is the net work done after one cycle of this process? How much work was done at each step?

by David Roundy