

## A cyclic process

A cylinder contains 0.50 mol of ideal gas at 27.0 °C. First, the gas is heated to 127.0 °C while the pressure is maintained constant at 1.0 atm by a frictionless piston.

- a. How much work is done by the gas in this process?
- b. On what is this work done?
- c. What is the change in internal energy of the gas?
- d. How much heat was supplied to the gas?

Second the gas is cooled back to 27.0 °C while the volume remains constant.

- e. How much work is done by the gas in this process?
- f. On what is this work done?
- g. What is the change in internal energy of the gas?
- h. How much heat was supplied to the gas?

Third, the gas is returned to its original state via an isothermal process.

- i. How much work is done by the gas in this process?
- j. On what is this work done?
- k. What is the change in internal energy of the gas?
- l. How much heat was supplied to the gas?
- m. Sketch the complete cycle on a PV diagram.