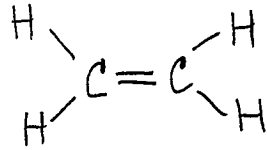


Quiz #2

Thermodynamics 3760

Problem#1 (5 points)

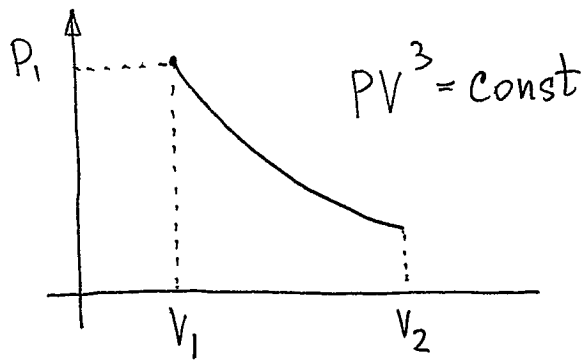
The molecule of ethylene has the following structure.



- a) Specify all degrees of freedom that this molecule has.
- b) What is the heat capacity of one mole of ethylene gas at high temperature when all degrees of freedom are active?

Problem#2 (5 points)

One mole of a monoatomic gas undergoes the following process



Find

- a) Work done by the gas.
- b) Change in the internal energy of the gas.
- c) Heat added to the gas (if gas actually releases the heat, it will have minus sign).

Problem #3 (5 points)

Two distinguishable molecules A and B are located in the chamber that has three compartments with volumes  $V_1$ ,  $V_2$ ,  $V_3$ . Volumes of the neck sections are negligible. The probability to find the molecule in any position in the chamber is the same.

- a) Find the probability of having the molecule A in  $V_1$  and the molecule B in  $V_2$ .
- b) What is the probability of the same arrangement if we have two indistinguishable molecules of A-type.

