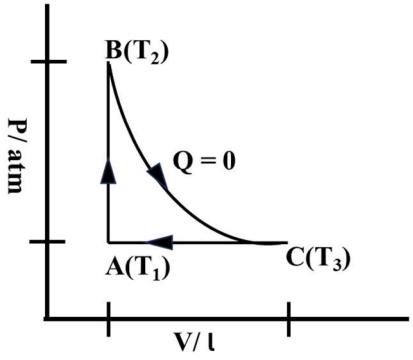
# Practice session IV

## Thermodynamics

1. One mole of an ideal monoatomic gas ($C_V = 1.5R$) is allowed to undergo the following cyclic process ABC. Calculate the efficiency of the cycle.




2. Calculate the entropy change of a sample of perfect gas under reversible isothermal expansion. (Given: the Volume occupied by 2 mole of any perfect gas molecules is tripled at any constant temperature).

3. Calculate the entropy change when 1 mole of argon at 25°C and 1.00 bar in a container of volume 0.8 $dm^3$ is allowed to expand to 1.2 $dm^3$ and is simultaneously heated to 75°C. ($C_V$=3/2 R)

4. Find entropy change for the melting of 3 g of ice (heat of fusion 79.7 cal/g) at STP. Find the same for the reverse process.

5. Show that $\Delta S_{mix,molar} = R\ln 2$ if equal volumes of two gases under the same conditions are mixed. Calculate the entropy of mixing if two moles of $N_2$ (g) are mixed with three moles of $O_2$ (g) at the same temperature and pressure. (Assume ideal behaviour).