## Concept to remember:

Chemical Thermodynamics-III:

Change in internal energy= $\Delta U$= heat transfer at constant volume ($q_v$)

As at constant volume $\Delta V=0$; work done =0; so, $q_v= \Delta U$

Generally, chemical reactions don't take place under constant volume, rather take place under constant pressure condition and the heat transfer at constant pressure process is denoted as $q_p$

Enthalpy doesn't depend on path. $\Delta H= \Delta (U +PV)$. At constant pressure, $\Delta H= \Delta U +P\Delta V$

**Extensive property**: Depends on size of the system

**Intensive property**: Independent of the size of the system

For constant pressure, $q_p = C_p\Delta T =\Delta H$ and at constant volume, $q_v = C_v\Delta T= \Delta U$

For **1 mol ideal gas**, $\Delta H=\Delta U+ \Delta(PV) = \Delta U +\Delta(RT)= \Delta U +R\Delta T$

Hence, $C_p \Delta T= C_v\Delta T + R\Delta T \rightarrow C_p = C_v +R \rightarrow C_p – C_v =R$