

10/8/08 Review

- State Variables - describe condition of the state of the system
 T, P, V

Small change dT, dP, dV
~~Path~~ Heat δQ & Work δW not state variables

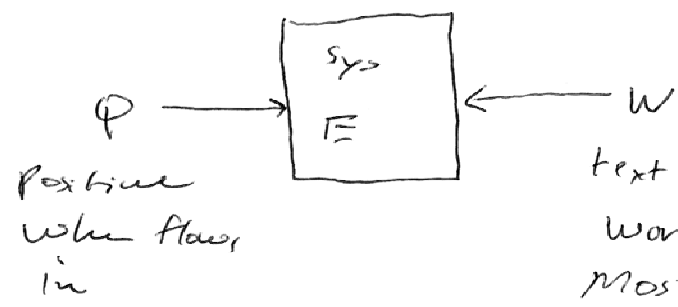
Equilibrium

- Thermal $\Delta T = 0$ in system & w/ environment.
- Chemical not reactions, no motion of constituents
- Mechanical NO unbalanced forces

\Rightarrow Thermodynamic Equilibrium

Reversible & Irreversible Processes

- Heat \Rightarrow ~~cause~~ exchange of energy via $\Delta T \neq 0$
Small amount δQ slash not state variable
- Work \Rightarrow exchange of energy via
Small amount δW $F \cdot dr$

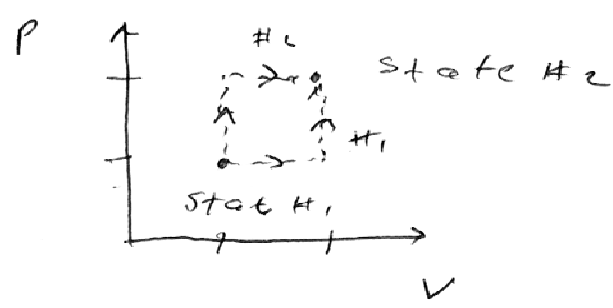


text of positive when work done on syst.
Most classical texts view opposite way.

o 1st Law

$$dE = dQ + dW$$

E is state variable or function



dQ & dW depend on path
 ~~dE, E, V, P~~ etc do not!

I deal gas

$$dW = -pdv$$

[sign depends on def of W!]

• Specific heat ~~is~~ heat capacity.

$$c = \frac{Q}{M \Delta T} = \frac{\delta Q}{m dT} \quad [J/kg \cdot ^\circ C]$$

$$= \frac{\delta Q}{n_m dT} \quad \text{molar specific heat} \quad [J/mol \cdot K]$$

• Latent heats

- fusion
solid \leftrightarrow liquid

$$Q = \pm m L_f$$

- Vaporization
liquid \leftrightarrow vapor

$$= \pm m L_v$$