

PHYS1013

Energy and Matter

$U_i (n_i, P_i, V_i, \dots)$ \rightarrow $U_f (n_f, P_f, V_f, \dots)$

$W = -nRT \int_{V_i}^{V_f} \frac{dV}{V} = -nRT \ln\left(\frac{V_f}{V_i}\right)$

$H = U + pV$ $T(K) = T(^{\circ}C) + 273.15$

$dH = dU + d(pV)$ $dH = dU + pdV + Vdp$

$C_p = (\Delta H / \Delta T)_p$ $\Delta U = Q - W$


$C_p = \left(\frac{\partial H}{\partial T}\right)_p$ $W = P\Delta U$ $\Delta S = nRT \ln\left(\frac{V_f}{V_i}\right)$

$dU = dq + dw$ $dH = dq - pdV + Vdp$ $W = \int_{V_1}^{V_2} P dV$


$H = U + PV$ $dH = C_p dT$ $\Delta H = q_p = C_p \Delta T$ $C_v = (\Delta U / \Delta T)_v$

$dw = -pdv$ $\Delta S = \frac{\Delta_{\text{trans}} H}{T}$ $ds \geq \frac{dq}{T}$

$C_v = \left(\frac{\partial U}{\partial T}\right)_v$



$\Delta U = m(u_2 - u_1) \Delta KE$
 $= \frac{1}{2} m (v_2^2 - v_1^2) \Delta PE$
 $= mg(z_2 - z_1)$



$W_b = \frac{P_2 V_2 - P_1 V_1}{1 - \gamma}$ $\eta_{th} = \frac{W_{net}}{Q_{in}} = 1 - \frac{Q_{out}}{Q_{in}}$

$dH = dq + Vdp$ $\Delta H = \Delta U + V\Delta p$


$Q = \Delta U + P\Delta V$

$dH = (dq)_p$ $\Delta H = q_p$ $T_R = \frac{T}{T_{cr}}$ $dU = C_v dT$

$dU = (dq)_v$ $\Delta U = q_v$ $\Delta U = q_v = C_v \Delta T$

$P_{cr} = \frac{P}{P_{cr}}$ $W_b = P_1 V_1 \ln \frac{V_2}{V_1}$ $= P_1 V_1 \ln \frac{P_1}{P_2}$ $= RT_1 \ln \frac{P_1}{P_2}$

$\Delta U = U_f - U_i = q(\text{heat}) + w(\text{work})$



$\gamma_k = \frac{V_{cr}}{RT_{cr}}$

Thermodynamics

Nick's Play List

Consideration by Reef
Fourteen by Wheatus
Rammstein - Keine Lust
Boygenius Not Strong Enough
Pisces- Jinjer
Numbers(I Can Only Count to 4)- Psychostick
Polyphia - Playing God
Ye by Burna Boy,
Na Money by Davido,
Ojuelegba by Wizkid
River or Daisy Mae by Leon Bridges
Welcome to Hell by black midi
I ain't no thief by The Viagra Boys
Car Lights - James Marriott
AC/DC
This is me trying – Taylor Swift
You Wish by Flyana Boss

Thank
You!

Week 5 (this week)

Today - double lecture slot as usual

No problem classes

No Thursday lecture

So you can revise.

Week 6

5/3 Tuesday mid-term test

9am Surnames M-Z

10am Surnames A-L

You can bring in a one page
A4 revision sheet with you -
hand in with the test for your
tutor to see.

If you have special room arrangements the office will contact you this week – if not there will be extra time in the main hall for those assigned it.

Week 6 (beyond the test)

Problem classes resume

No Thursday lecture

MP due by Sunday

Week 7

No Tuesday lectures

Problem classes as usual

Thursday – lectures resume.