Resumen de Termodinámica

Tipo de transformación	Ecuación	**Q** Calor $\Delta Q = \Delta U + \Delta W$	**W** Trabajo	**U** Energía interna	**S** Entropía
Isoterma $\Delta T = 0$ $\Delta H = 0$	PV = K	$\Delta Q = \Delta W$	$\Delta W = \Delta Q$ $W = n \cdot R \cdot T \cdot \ln \frac{V_2}{V_1}$ $W = n \cdot R \cdot T \cdot \ln \frac{P_1}{P_2}$	$\Delta U = 0$	$S = \frac{Q}{T}$ $S = n \cdot R \cdot T \cdot \ln \frac{V_2}{V_1}$ $S = n \cdot R \cdot T \cdot \ln \frac{P_1}{P_2}$
Isostérica $\Delta V = 0$	$\frac{P}{T} = \frac{P'}{T'}$	$\Delta Q_v = \Delta U$	$\Delta W = 0$	$\Delta U = n \cdot C_v \cdot \Delta T$	$S = n \cdot C_v \cdot \ln \frac{T_2}{T_1}$
Isobárica $\Delta P = 0$	$\frac{V}{T} = \frac{V'}{T'}$	$\Delta Q_p = n \cdot C_p \cdot \Delta T$	$\Delta W = P \cdot \Delta V$	$\Delta U = (C_p - R) \cdot \Delta T$ $\Delta U = n \cdot C_v \cdot \Delta T$	$S = n \cdot C_p \cdot \ln \frac{T_2}{T_1}$
Adiabático $\Delta Q = 0$ $\gamma = \frac{C_P}{C_V}$	$P_1 V_1^{\gamma} = P_2 V_2^{\gamma}$ $T \cdot V^{\gamma - 1} = K$ $P^{\frac{1-\gamma}{\gamma}} \cdot T = K$	$\Delta Q = 0$	$W = \frac{p_f V_f - P_i V_i}{\gamma - 1}$ $\Delta W = -\Delta U = n \cdot C_v \Delta T$	$\Delta U = -\Delta W = n \cdot C_v \Delta T$	$\Delta S = 0$
Primer Principio $\Delta U = Q - W$ **Entalpia** $\Delta H = U + P \cdot V$ $\Delta H = \Delta Q_P$ $\Delta U = \Delta Q_V$	$\frac{P \cdot V}{T} = K$ $Q = m \cdot C_e \cdot \Delta T$ $C_p - C_v = R$ **Gas monoatómico** $Cv = \frac{3}{2} nR, C_p = \frac{5}{2} nR$ **Gas diatómico** $Cv = \frac{5}{2} nR, C_p = \frac{7}{2} nR$	R= 2 Cal R= 0.082 $\frac{at.\cdot l.}{mol \cdot K}$ R= 8.314 $\frac{Pa \cdot m^3}{mol \cdot K}$ R= 8.314 $\frac{Jouls}{mol \cdot K}$	**Segundo Principio** **Entropía** $S = \frac{Q}{T}$ **Energía Libre** $\Delta G^0 = \Delta H - T \Delta S$ $\Delta G^0 = - R \cdot T \cdot \ln K_e$ $\Delta G^0 = - 2.3 \cdot R \cdot T \cdot \log K_e$	$\Delta G^0 = -n \cdot F \cdot €$ $\Delta € = \Delta €^0 - \frac{RT}{nF} \cdot \ln K$ **Transmisión de calor** $\Phi = \frac{\Delta Q}{\Delta t} = A \bullet K \bullet \frac{\Delta T}{\Delta X}$ $R = \frac{\Phi \bullet \Delta x}{K \cdot A}$	Rendimiento $\eta = \frac{W}{Q} = \frac{Q + Q'}{Q}$ $\eta = \frac{T + T'}{T}$ Eficiencia $K = \frac{Q\_frigorífico}{W\_motor}$

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