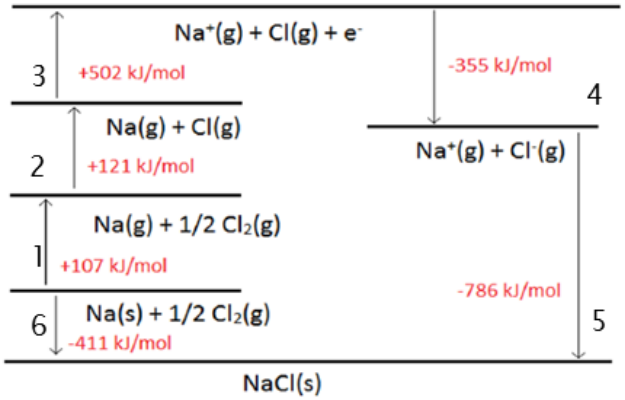
Thermodynamics Knowledge organiser

1. Keywords

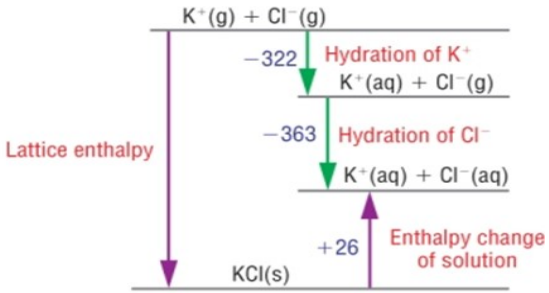
Standard enthalpy change of atomisation $\Delta_{at}H^{\circ}$	The enthalpy change when one mole of **gaseous** atoms are formed from a substance at its standard states
Ionisation enthalpy $\Delta_{ie}H^{1st}$	The enthalpy change when one mole of ions are formed from one moles of **gaseous** atoms under standard conditions
Electron affinity ΔH_{ea}^{1st}	The enthalpy change when one mole of **gaseous** atoms gain one mole of electrons under standard conditions
Lattice association enthalpy $\Delta_{Lf}H$	The enthalpy change when one mole of ionic lattice is *formed from its **gaseous** ions under standard conditions*
Lattice dissociation enthalpy $\Delta_{Ld}H^{\circ}$	The enthalpy change when one mole of an ionic lattice dissociates into isolated gaseous ions under standard conditions
Hydration enthalpy $\Delta_{Hy}H^{\circ}$	The enthalpy change when one moles of gaseous ions are completely surrounded by water
Enthalpy of solution $\Delta_{sol}H^{\circ}$	The enthalpy change when I mole of solute is completely dissolved in solvent so that the ions are infinitely diluted, under standard conditions.
Entropy	The measure of disorder within a system measured in J mol^{-1}
Entropy change ΔS	Σ entropy products - Σ entropy reactants
Gibbs free energy ΔG	A measure of the feasibility of a reaction. For a reaction to be feasible ΔG must ≤ 0

2. Born-Haber cycle: basic layout

1	Atomise
2	Atomise
3	Ionise
4	Electron affinity
5	Lattice enthalpy
6	Enthalpy of formation



3. Born-Haber cycle: enthalpy of solution



4. Gibbs free energy

$$\Delta G = \Delta H - T\Delta S$$

ΔG	Gibbs free energy / KJ
ΔH	Enthalpy change / KJ mol^{-1}
T	Temperature / K
ΔS	Entropy change / **J mol^{-1}**