Born-Haber Cycle

Introduction: Born-Haber cycle is used to calculate the lattice energy of a substance based on experimental of enthalpy changes. The Born-Haber cycle is an application of Hess' law of heat summation.

Enthalpy Change	Symbol	Example Equations
Standard enthalpy change of formation- the enthalpy change when one mole of a compound is formed from its elements in their standard states.	$\Delta H_f^{\ominus}$	$H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(l)}$ $Na_{(s)} + \frac{1}{2}Cl_{2(g)} \rightarrow NaCl_{(s)}$
Standard enthalpy change of atomisation- the enthalpy change when 1 mole of atoms in gaseous state is formed from the element in its standard state.	$\Delta H_{at}^{\ominus}$	$Na_{(s)} \rightarrow Na_{(g)}$ $\frac{1}{2}Cl_{2(g)} \rightarrow Cl_{(g)}$
First electron affinity- the enthalpy change when 1 mole of gaseous atoms each gain 1 electron.	$\Delta H_{Ea}^{\ominus}$	$Cl_{(g)} \rightarrow Cl^-_{(g)}$ $O_{(g)} \rightarrow O^-_{(g)}$
First ionisation enthalpy- the enthalpy change when 1 mole of gaseous 1+ ions are formed from 1 mole of gaseous atoms.	$\Delta H_{i(1)}^{\ominus}$	$Na_{(s)} \rightarrow Na^+_{(g)}$ $Ca_{(g)} \rightarrow Ca^+_{(g)}$
Lattice enthalpy- the enthalpy change when 1 mole of solid ionic compound is made from gaseous ions.	$\Delta H_{LE}^{\ominus}$	$Na^+_{(g)} + Cl^+_{(g)} \rightarrow NaCl_{(s)}$

https://www.youtube.com/watch?v=YEJ5ITLC4IU&feature=emb_logo

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