

Standard Enthalpy Change for A Levels

S/N	Terms	'Amt of substance' used in calculation	Sample Equation	Signs of ΔH	Remarks
1	$\Delta H_r^\ominus$	Overall based on thermochemical eqn	$2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$	+/-ve	$\Delta H_r = \sum \Delta H_f$ of product – $\sum \Delta H_f$ of reactant
2	$\Delta H_n^\ominus$	Water formed after neutralisation	$\text{NaOH}(\text{aq}) + \text{HCl}(\text{aq}) \rightarrow \text{NaCl}(\text{aq}) + \text{H}_2\text{O}(\text{l})$	Always -ve	Formation of water
3	$\Delta H_c^\ominus$	Compound before burning	$\text{C}_3\text{H}_6(\text{g}) + 4\frac{1}{2}\text{O}_2(\text{g}) \rightarrow 3\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$	Usually -ve	Energy is usually released during burning
4	$\Delta H_{\text{atom}}^\ominus$	Gaseous atoms formed after atomisation	$\frac{1}{2}\text{Cl}_2(\text{g}) \rightarrow \text{Cl}(\text{g})$	Always +ve	Breaking the bonds between atoms
		Gaseous compound before atomisation	$\text{C}_2\text{H}_6(\text{g}) \rightarrow 2\text{C}(\text{g}) + 6\text{H}(\text{g})$	Always +ve	Breaking bonds in the compound
5	$\Delta H_{\text{disso}}^\ominus$	Covalent bonds broken during dissociation	$\text{CH}_4(\text{g}) \rightarrow \text{CH}_3(\text{g}) + \text{H}(\text{g})$ Number of C-H bonds broken	Always +ve	Breaking the bond between atoms
6	I.E.	Electrons removed from gaseous atoms	$\text{Cl}(\text{g}) \rightarrow \text{Cl}^+(\text{g}) + \text{e}^-$	Always +ve	Overcome the attraction of valence e^- and nucleus
7	E.A.	Electrons added to gaseous atoms	$\text{O}(\text{g}) + \text{e}^- \rightarrow \text{O}^-(\text{g})$	1 st : Always -ve Usually +ve	e^- forms bond with atom; overcome e^- repulsion
8	$\Delta H_{\text{latt}}^\ominus$	Ionic compound formed from gaseous ions	$\text{Mg}^{2+}(\text{g}) + 2\text{Cl}^-(\text{g}) \rightarrow \text{MgCl}_2(\text{s})$	Always -ve	Formation of bond between ions
9	$\Delta H_{\text{hyd}}^\ominus$	Gaseous ions before hydration	$\text{Na}^+(\text{g}) + \text{aq} \rightarrow \text{Na}^+(\text{aq})$	Always -ve	Formation of bond between ion and water
10	$\Delta H_{\text{sol}}^\ominus$	Substance before dissolving	$\text{MgCl}_2(\text{s}) + \text{aq} \rightarrow \text{Mg}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq})$	+/-ve	-ve $\rightarrow$ soluble +ve $\rightarrow$ insoluble
11	$\Delta H_f^\ominus$	Compound formed from constituent elements	$\text{K}(\text{s}) + \frac{1}{2}\text{Cl}_2(\text{g}) + \frac{3}{2}\text{O}_2(\text{g}) \rightarrow \text{KClO}_3(\text{s})$	+/-ve	$\Delta H_f^\ominus$ of element = 0

PS: Unless the definition states that the particles are in its gaseous state, it will always be in its standard state.