

Subject	Year	Term
Chemistry	12	6
Topic		
5.2.1 Lattice Enthalpy & 5.2.2 Enthalpy and Entropy		
Content (Intent)		
Prior Learning (Topic) GCSE: C5. Year 12: 1.1, 1.2, 2.1, 3.1.1 Periodicity and 3.2.1 Enthalpy changes		
<p>Lattice enthalpy</p> <ul style="list-style-type: none"> Define lattice enthalpy (formation of 1 mol of ionic lattice from gaseous ions, Δ_{LEH}) and understand how it can be used as a measure of the strength of ionic bonding in a giant ionic lattice (see also 2.2.2 b–c) <p>Born–Haber and related enthalpy cycles</p> <ul style="list-style-type: none"> Be able to construct Born–Haber cycles and carry out related calculations Define and use the terms: enthalpy change of solution (dissolving of 1 mol of solute, $\Delta_{sol}H$), enthalpy change of hydration (dissolving of 1 mol of gaseous ions in water, $\Delta_{hyd}H$) Be able to give a qualitative explanation of the effect of ionic charge and ionic radius on the exothermic value of a lattice enthalpy and enthalpy change of hydration. <p>Entropy</p> <ul style="list-style-type: none"> Know that entropy is a measure of the dispersal of energy in a system which is greater, the more disordered a system Be able to explain the difference in magnitude of the entropy of a system involving solids, liquids and gases or a different number of gaseous molecules Calculate the entropy change of a system, ΔS, and related quantities for a reaction given the entropies of the reactants and products <p>Free energy</p> <ul style="list-style-type: none"> Be able to explain that the feasibility of a process depends upon the entropy change and temperature in the system, $T\Delta S$, and the enthalpy change of the system, ΔH Be able to explain and carry out related calculations, of the free energy change, ΔG, as: $\Delta G = \Delta H - T\Delta S$ (the Gibbs' equation) and that a process is feasible when ΔG has a negative value Describe some of the limitations of predictions made by ΔG about feasibility, in terms of kinetics. 		
Future Learning (Topic) End topic – Revision after this		
How will knowledge and skills be taught? (Implementation)	How will your understanding be assessed & recorded (Impact)	
<p>Practical work</p> <ol style="list-style-type: none"> Lattice enthalpy Born Haber cycles (type 1) Born Haber cycles (type 2) Ionic charge and radius Entropy and ΔS Gibbs free energy 	<p>- 2 x standard homework (Grade given. Written feedback. Response expected.)</p>	

Determining the enthalpy change of solution indirectly.
Relationship between enthalpy, entropy and feasibility

Written

Presentations
Worked through calculations and explanations
Past paper question examples and answers
Construction of Born-Haber cycles
Modelled answers with key points/terms

How can parents help at home?

Look at the topic specific resources on the VLE
Use appropriate websites: MachemGuy, Allery Chemistry, Chemistry World – by Royal Society of Chemistry, ChemGuide.
Take an interest! Ask your children what they have learnt and be curious about their learning.

Helpful further reading/discussion

Reading

Text book: A level chemistry for OCR by Rob Ritchie and Dave Gent. Chapter 22 p.346-371

The Science of Everyday Life by Marty Jopson
Why Chemical Reactions Happen by Keeler and Wothers

Vocabulary Lists

lattice enthalpy
enthalpy of solution
enthalpy of atomisation
ionisation energy
hydration enthalpy
electron affinity
ionic radius
ionic charge
exothermic
endothermic
entropy
disorder

Careers Links

Medicine
Veterinary science
Material science
Biomedical sciences
Environmental science
Toxicologist
Pharmacist
Dentist