Changing lives through learning

Access to Higher Education Unit

This unit forms part of an Access to HE Diploma. If delivering the graded version of this unit, please refer to the Provider Handbook for details on grading descriptors and the application of these across units within your programme.

Unit Title: Thermodynamics

Graded Unit Reference Number: GA36CHE19

Ungraded Unit Reference Number: UA36CHE19

Module: Chemistry

Level: 3

Credit Value: 6

Minimum Guided Learning Hours: 60

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Understand that chemical reactions are always accompanied by enthalpy changes	1.1 Explain the differences between exothermic and endothermic reactions
	1.2 Interpret enthalpy profile diagrams for exothermic and endothermic reactions including the concept of activation energy
	1.3 Perform simple calorimetric experiments and complete required calculations to determine ΔH values
2. Understand specified enthalpy changes	2.1 Define standard conditions and standard enthalpy changes of formation, combustion and reaction
	2.2 State Hess' Law and apply it to indirectly determine enthalpy changes using given data on standard enthalpy changes of combustion and of formation
	2.3 Define mean bond enthalpy and calculate enthalpy changes of reaction from mean bond enthalpy values
	2.4 Evaluate the accuracy of the ΔH values calculated from calorimetry and from standard bond enthalpies, compared to those calculated from standard enthalpies of combustion or formation

3. Understand the usefulness of the Born-Haber cycle on enthalpy calculations	3.1 Define the following terms: a) first ionisation enthalpy b) standard enthalpy of atomisation c) first electron affinity d) lattice enthalpy of formation e) enthalpy of hydration f) enthalpy of solution
	3.2 Draw Born-Haber cycles for a range of binary compounds to calculate unknown enthalpy values
	3.3 Predict enthalpies of formation of theoretical compounds using Born-Haber cycles and explain whether these compounds may be expected to exist
4. Understand the factors affecting the feasibility of a chemical reaction	4.1 Discuss the feasibility of a chemical reaction, using the relationship $\Delta G = \Delta H - T\Delta S$ (derivation not required)
	4.2 Rearrange the equation $\Delta G = \Delta H - T\Delta S$ to calculate unknown values for a series of reactions, using data provided on tables and graph
	4.3 Predict which of the above reactions would be feasible and explain why