Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

Topic 5: Energetics/thermochemistry PLP

**What you should know already:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| I can explain why some reactions are endothermic and others exothermic from a reaction profile | Image result for reaction profile exothermic and endothermic**Energy change = Energy of products – energy of reactants****ΔHreaction = ΔHproducts - ΔHreactants**Therefore, exothermic reactions **ΔH= (-) value**Endothermic reactions **ΔH= (+) value** |  |  |  |

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| **Learning Intention**We are learning to how to compare the enthalpy of reactants and products in a reaction |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 1 | I can state what is meant by an **‘enthalpy change’** |  |  |  |  |
| 2 | I can describe how the energy changes from reactants to products during an **exo**thermic reaction, including their thermodynamic stability. |  |  |  |  |
| 3 | I can describe how the energy changes from reactants to products during an **endo**thermic reaction, including their thermodynamic stability. |  |  |  |  |

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| **Learning Intention**We are learning how to calculate enthalpy changes |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 4 | I can explain the equationEh = cmΔT |  |  |  |  |
| 5 | I can express the energy for a reaction as a value **per mole** |  |  |  |  |
| 6 | I can state the definition for **enthalpy of combustion** |  |  |  |  |
| 7 | I can write a formula equation that represents an enthalpy of combustion | e.g. Combustion of methanol: |  |  |  |
| 8 | I can draw a labelled diagram of the apparatus used to practically determine the enthalpy of combustion of a substance |  |  |  |  |
| 9 | I can explain the difference between enthalpy values obtained experimentally compared to data book values including how to account for some of the difference |  |  |  |  |
| 10 | I can state the definition of **enthalpy of solution** |  |  |  |  |
| 11 | I can state the definition of **enthalpy of formation** |  |  |  |  |
| 12 | I can explain the limitations of enthalpy calculations involution chemicals as solutions |  |  |  |  |
| 13 | I know what is meant by standard conditions and how this is shown as a symbol. |  |  |  |  |

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| L**earning Intention**We are learning about how Hess’ Law can be used |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 14 | I can define Hess’ Law |  |  |  |  |
| 15 | I can describe why Hess’ Law is useful |  |  |  |  |
| 16 | I can use Hess’ Law to calculate an enthalpy change for a reaction. | e.g. C(s) 🡪 C(g) ∆H = +715kJmol-1 3C(s) + 4H2(g) 🡪 C3H8(g) ∆H = -104kJmol-1**Target equation: 3C(g) + 4H2(g) 🡪 C3H8(g) ∆H = ???**  |  |  |  |
| 17 | I know how the databook can be used to help get data for Hess’ Law calculations |  |  |  |  |

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| L**earning Intention** We are learning how enthalpy changes can be determined theoretically |
| No. | **Outcome** | **What you know and understand** | ☹ | 😐 | ☺ |
| 18 | I can define “mean bond enthalpy” and why it can differs from experimental values. |  |  |  |  |
| 19 | I can use mean bond enthalpy values to calculate the enthalpy change for a reaction. |  |  |  |  |

**Key Words from Enthalpy**

|  |  |
| --- | --- |
| **Key Word or Phrase** | **Meaning** |
| Temperature |  |
| Heat  |  |
| Enthalpy change |  |
| Standard conditions |  |
| Enthalpy of combustion |  |
| Enthalpy of solution |  |
| Enthalpy of neutralisation |  |
| Specific heat capacity of water |  |
| Enthalpy of formation |  |







**Hess’ Law Past Paper Questions**

**2011**



**2009**

**2010**

**2010**



8



**2009**

**Hess’ Law Continued**

Q12



2007

2008

Q12



2007

2006

2006



2006

**Hess’ Law Past Paper Questions**

**2011**



**2009**

**2010**

**2010**