Edexcel IAL Chemistry A-Level

Topic 6 - Energetics

Flashcards

What is enthalpy change?

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The heat energy change measured at constant pressure.

What are standard conditions?

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Pressure - 100 kPa

Temperature - 298 K

Solutions at a concentration of 1 mol dm^{-3}

What is an exothermic reaction?

What is an exothermic reaction?

A reaction in which energy is released.

What is an endothermic reaction?

What is an endothermic reaction?

A reaction in which energy is taken in.

What is the sign of ΔH for exothermic and endothermic reactions?

What is the sign of ΔH for exothermic and endothermic reactions?

Exothermic: ΔH is negative

Endothermic: ΔH is positive

What does an enthalpy level diagram look like for an exothermic reaction?

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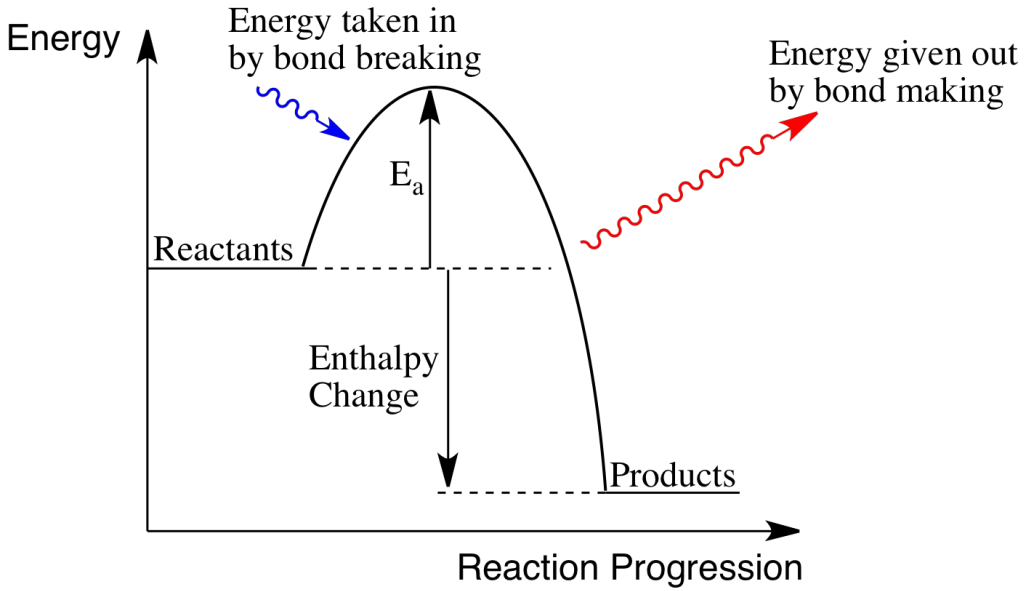

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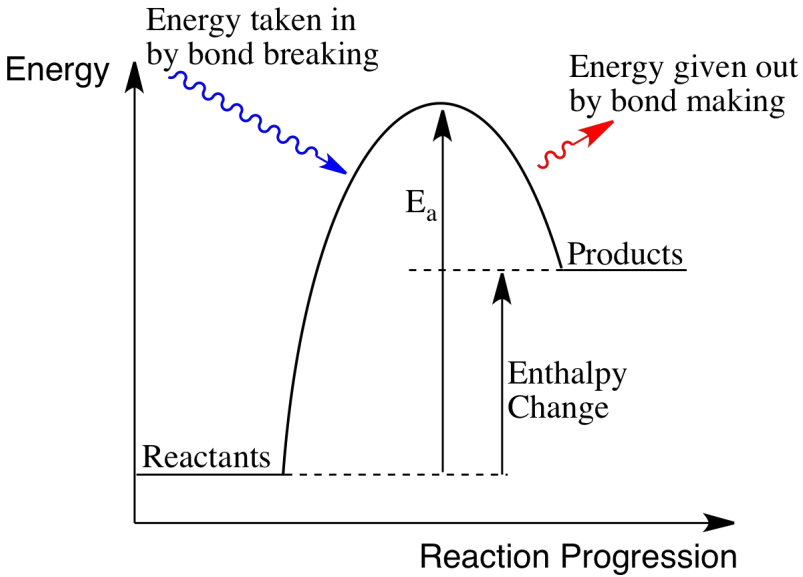

What is the definition for the standard enthalpy change of reaction, $\Delta_r H^\theta$?

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The enthalpy change that occurs when the quantities of reactants shown in the equation react under standard conditions, with all reactants and products and in their standard states.

What is the definition for the standard enthalpy change of formation, $\Delta_f H^\theta$?

What is the definition for the standard enthalpy change of formation, $\Delta_f H^\theta$?

The enthalpy change when one mole of product is formed from its constituent elements with all reactants and products in their standard states, under standard conditions.

What is the definition for the standard enthalpy change of combustion, $\Delta_c H^{\theta}$?

What is the definition for the standard enthalpy change of combustion, $\Delta_c H^\theta$?

The enthalpy change that occurs when one mole of compound is completely reacted with excess oxygen under standard conditions with all reactants and products in their standard states.

What is the definition for the standard enthalpy change of neutralisation, $\Delta_{neut}H^{\theta}$?

What is the definition for the standard enthalpy change of neutralisation, $\Delta_{neut}H^{\theta}$?

The enthalpy change that occurs when one mole of water is formed from a neutralisation reaction between an acid and base under standard conditions, with all reactants and products in their standard states.

What is the definition for the standard enthalpy change of atomisation, $\Delta_a H^\theta$?

What is the definition for the standard enthalpy change of atomisation, $\Delta_a H^\theta$?

The enthalpy change that occurs when 1 mole of gaseous atoms is formed from its element in its standard state, under standard conditions.

What equation can be used to work out the energy transferred in a reaction?

What equation can be used to work out the energy transferred in a reaction?

$$q = mc\Delta T$$

q = energy released/absorbed (J)
m = mass (g)
c = specific heat capacity (J g^{-1} $°C^{-1}$)
ΔT = temperature change (°C)

Why are energy change reactions carried out in an insulated container?

Why are energy change reactions carried out in an insulated container?

To prevent heat energy loss to the surroundings.

What is Hess's law?

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The enthalpy change of a reaction is independent of the pathway taken.

What is mean bond enthalpy?

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The mean energy needed to break a specific covalent bond, averaged out across a wide variety of different compounds.

How are bond enthalpy and bond strength related?

How are bond enthalpy and bond strength related?

The larger the bond enthalpy, the stronger the bond, hence the longer it takes to break this bond.

Therefore bonds with lower average bond enthalpies are weaker and will break first in a reaction.