

Biology

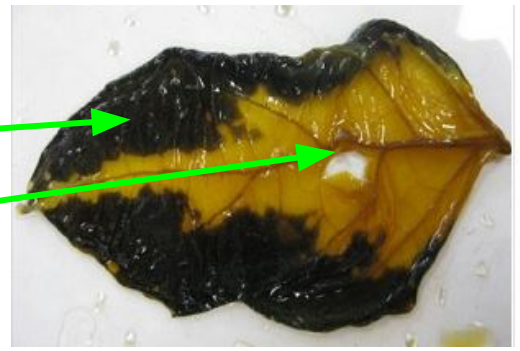
GCSE Bioenergetics

1

| | | |
|-------------------------|---------|-----------|
| Learned | Revised | Confident |
| | | |
| _____ % Achieved: _____ | | |

Starch present

No starch present



| N ^{ocv} | Keyword | Definition |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| 2 | Aerobic | Respiration that involves the use of oxygen to transfer energy. |
| 3 | Anaerobic | Respiration that takes place without oxygen to transfer energy. |
| 4 | Fermentation | The process of breaking down sugars by anaerobic respiration in bacteria or yeast. |
| 5 | Metabolism | The sum of all the reactions in the cell or body. This is controlled by enzymes |
| 6 | Oxygen debt | The amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells. |
| 7 | Photosynthesis | An endothermic reaction in which energy is transferred from the environment to chloroplasts by light. |
| 8 | Respiration | A chemical reaction that breaks down glucose to release energy. |

| N ^{ocv} | Facts Definition |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9 | Factors affecting the rate of photosynthesis: Carbon dioxide, Temperature, Light intensity |
| 10 | Plants use glucose for: Respiration, Making cellulose, Making amino acids, Converted and stored as lipids (fats), Converted and stored as starch, Stored as sucrose and other sugars in fruits. |

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12



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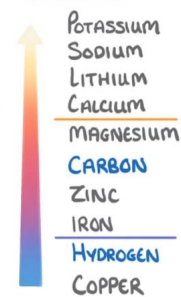
Chemistry

GCSE Chemical changes

1

| Acid Formula | Acid Name | Salt Name |
|--------------------------------|--------------|-----------|
| HCl | Hydrochloric | Chloride |
| H ₂ SO ₄ | Sulphuric | Sulphate |
| HNO ₃ | Nitric | Nitrate |
| H ₃ PO ₄ | Phosphoric | Phosphate |

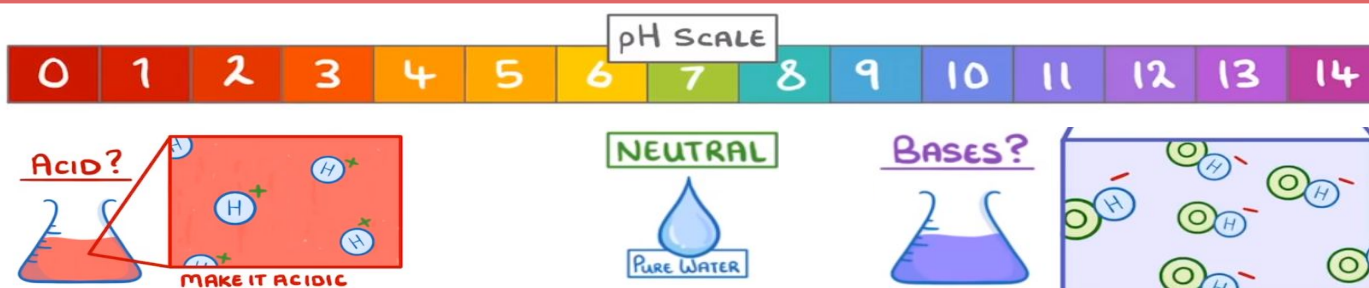
REACTIVITY SERIES



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| _____ % Achieved: _____ | | |

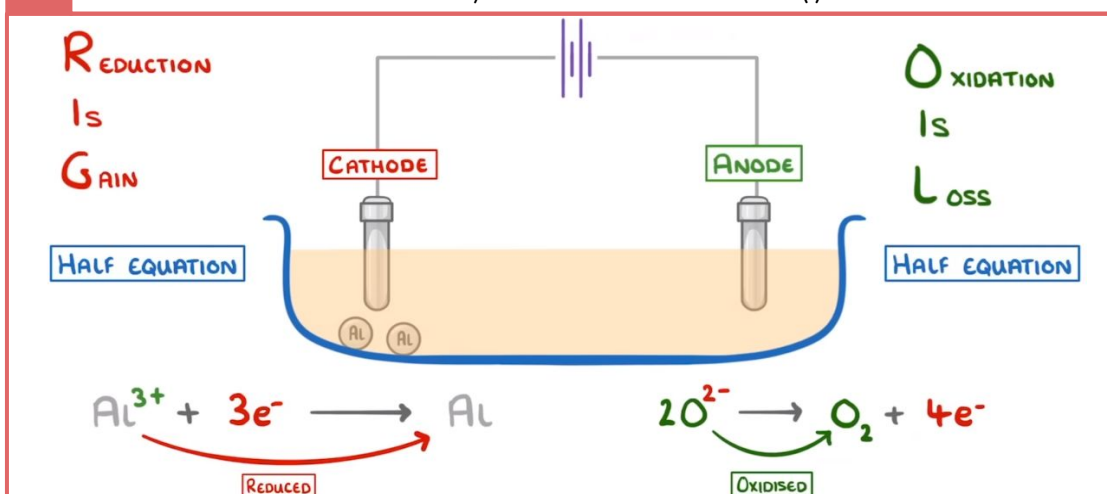
| Nº | Keyword | Definition |
|----|----------------|---------------------------------------------------------------------------------------------------------------------------|
| 2 | Acid | Substance with a pH less than 7 that forms H ⁺ ions in solution e.g. H ₂ SO ₄ |
| 3 | Base | A substance that reacts with an acid in a neutralisation reaction e.g. CaO |
| 4 | Alkali | Substance with a pH greater than 7 that forms OH ⁻ ions in solution e.g. NaOH |
| 5 | Strong acid | Strong acids will fully ionise / dissociate in solution whereas weak acids only partially ionise / dissociate in solution |
| 6 | Neutralisation | A reaction between acids and bases where a neutral product i.e. water forms |
| 7 | Displacement | A more reactive element will replace a less reactive element from a compound |
| 8 | Oxidation | Where oxygen is gained or electrons are lost by a species |
| 9 | Reduction | Where oxygen is lost or electrons are gained by a species |
| 10 | Electrolysis | Breaking down a substance, usually ionic compounds, using electricity |

11



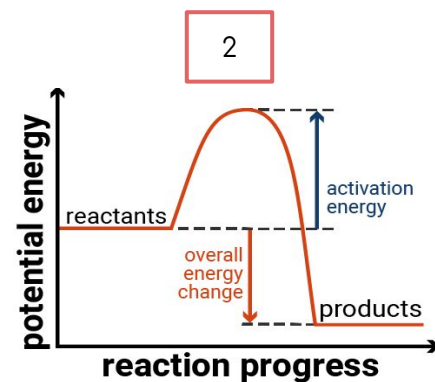
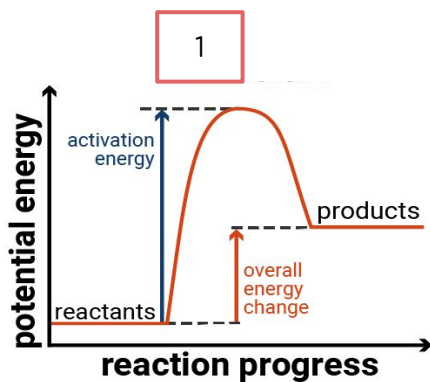
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Electrolysis of Aluminium oxide (l)



GCSE Energy changes

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| Learned | Revised | Confident |
| | | |
| _____ % Achieved: _____ | | |



| Nº | Keyword | Definition |
|----|-----------------------|------------------------------------------------------------------------------------------------|
| 3 | Endothermic | A reaction that takes in energy from the surroundings |
| 4 | Exothermic | A reactions that releases energy to the surroundings |
| 5 | Activation energy | Minimum amount of energy required to start a reaction |
| 6 | Overall energy change | The difference between the energy of the reactants and the products |
| 7 | Catalyst | Provides an alternate reaction pathway with a lower activation energy to speed up the reaction |

| Nº | Facts |
|----|-----------------------------------------------------------------------------------------------------------|
| 8 | Bond breaking is an endothermic process, it requires energy |
| 9 | Bond making is an exothermic process, it releases energy |
| 10 | An endothermic reaction has a positive overall energy change - more energy was taken in than was released |
| 11 | An exothermic reaction has a negative overall energy change - less energy was taken in than was released |

| Nº | Overall energy change calculations (HIGHER) |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 | Complete these questions using a simple T-table with "Break" and "Make" as headings. Tick off the bonds as you count them. Total break - Total make = Overall energy change |

OVERALL REACTION

$$\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$$

ENDOOTHERMIC

H-H Cl-Cl

BREAK BREAK

TOTAL

H-Cl

H-Cl

FORM

TOTAL

EXOTHERMIC

| MOLECULE | ENERGY (kJ/mol) |
|----------|-----------------|
| H-H | 436 |
| Cl-Cl | 242 |
| H-Cl | 431 |

ENERGY REQUIRED TO BREAK BONDS **ENERGY RELEASED BY FORMING BONDS**

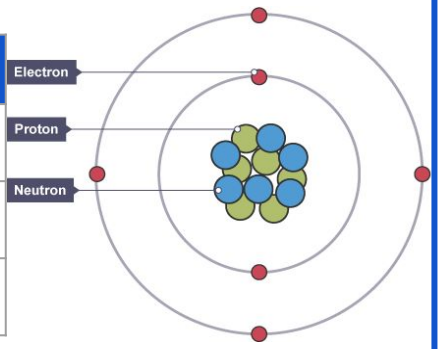
678 - 862

= -184 kJ/mol

Physics

GCSE Atomic structure and radiation




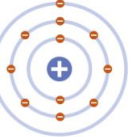
| N ^o | Particle | Mass | Charge |
|----------------|----------|--------|--------|
| 1 | Proton | 1 | +1 |
| 2 | Neutron | 1 | 0 |
| 3 | Electron | 1/2000 | -1 |

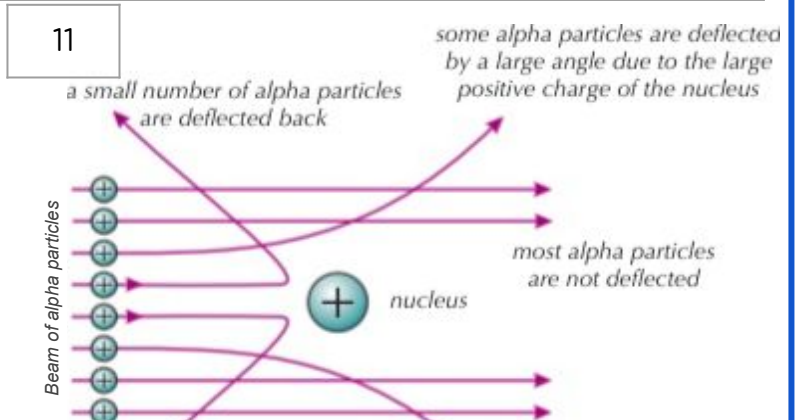


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| Learned | Revised | Confident |
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_____ % Achieved: _____

| N ^o | Keyword | Definition |
|----------------|---------------|-----------------------------------------------------------------------------------------|
| 4 | Activity | The number of nuclei of a sample that decay per second |
| 5 | Contamination | Has unwanted radioactive atoms on or in it |
| 6 | Half life | The time it takes for the number of nuclei of a radioactive isotope in a sample to half |
| 7 | Ion | A charged particle (an atom that has gained/lost electrons) |
| 8 | Irradiation | Exposure to radiation |
| 9 | Isotope | An element with a different number of neutrons |

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | 11 |
| <p>SOLID SPHERE MODEL</p>  <p>JOHN DALTON 1803</p> | <p>PLUM PUDDING MODEL</p>  <p>J.J. THOMSON 1904</p> |
| <p>NUCLEAR MODEL</p>  <p>ERNEST RUTHERFORD 1911</p> | <p>PLANETARY MODEL</p>  <p>NIELS BOHR 1913</p> |



| N ^o | Type of radiation | Change in the nucleus | Ionising power | Range in air | Stopped by |
|----------------|---------------------------------------------------------------------------------------|--------------------------------------------------|------------------------|----------------------------------|--------------------------------------------------------------------|
| 12 | α alpha particle (two protons and two neutrons) | nucleus loses two protons and two neutrons | highest ionising power | travels a few centimetres in air | stopped by a sheet of paper |
| 13 | β beta particle (fast-moving electron) | a neutron changes into a proton and an electron | high ionising power | travels \approx 1 m in air | stopped by a few millimetres of aluminium |
| 14 | γ gamma radiation (short-wavelength, high-frequency EM radiation) | some energy is transferred away from the nucleus | low ionising power | virtually unlimited range in air | stopped by several centimetres of thick lead or metres of concrete |