

TOPIC 5 - Electrical Circuits (Background)

The idea of Electric Charge

- Greeks discovered ^{that by} rubbing dissimilar objects the objects may attract one another.
- They explained this phenomenon with the idea of an electrical charge. They suggested that there were two types of charges \Rightarrow positive and negative
 - like charges \Rightarrow repel
 - unlike charges \Rightarrow attract
- rubbing causes one type of charge (we know now that it is the negative charge) to be transferred from one object to the other \Rightarrow leaves one object positive and the other becomes negative \Rightarrow attraction.

Electrostatics - the study of stationary charges

Atoms

- Greeks were the first to come up with the idea of an atom and said that atoms were the smallest particles of an element which have the properties of the element

- 19th + 20th research showed the structure of the atom \Rightarrow small positively charged nucleus containing protons + neutrons + surrounded by negatively charged electrons moving in electron clouds.



force of attraction \oplus and \ominus
hold the atom together

- mass (most) is centred in the nucleus ($p + n$)
- neutral atom $\Rightarrow p = e$
- # of protons determines what element

The flow of charge is electric current

- metals have outer electrons that are free to move from one atom to the next => good electrical conductors
- the nucleus does not move => only the electrons
- if the electron is completely removed from an atom then you are left with positively charged ion (cation)
- an atom that gains an electron will become a negatively charged ion (anions)

metals => flow of electrons } electrical current
 ionic solutions => flow of ions }

