

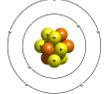
Ch 5. Electricity & Magnetism
5.1 Electrical Charge

Write this in your notebook.

- Most objects are **neutral** because they have an equal # of protons (+) and electrons (-).
- Electrons can be transferred, this causes an object to become charged.
 - Negative charge = object has more electrons than protons.
 - Positive charge = object has more protons than electrons.

Write this in your notebook.

(5.1 continued)



- 1 Coulomb (C) = the charge of 6.25×10^{18} electrons (-).
- One electron has a charge of 1.602×10^{-19} C.
- Conductors** permit the movement of electrons. (the charge spreads out quickly)
 - Eg. Metals, graphite, electrolytic solutions
- Semiconductors** slow the movement of electrons.
- Insulators** stop the movement of electrons.
 - Eg. Plastics, ceramics, wood, glass
- The **triboelectric** series (p146) is a list that ranks an object's ability to take negative electrons.

Only **negative** charges **move!**
 Positive charges **NEVER** move!!

Triboelectric series is a list that ranks objects' ability to take **negative electrons**

Rubber
Ebonite
Polyethylene
Cotton
Paper
Silk
Wool
Glass
Acetate
Fur / hair

Items at top **take** electrons (-)

Items at bottom **lose** electrons (-)

Add this to your formula sheet!



5.2 Static electricity.

Write this in your notebook.

- You can create a charge by causing electrons to be transferred from one item to another by:
 - Friction.** Items high on the triboelectric series pull electrons away from lower items.
 - Induction.** Without contact! A charged object can cause the electrons in a neutral object to shift to one side.
 - Conduction.** Once in contact, a charged object can share its charge with another neutral object.
 - See p147

Calculations:
 How do you measure "charge"

Write this in your notebook.

- Ex. After charging a piece of fabric Kim determines that it has a charge of 9.1 C.

How many electrons has it lost?

$$\frac{1C}{9.1C} \times 6.25 \times 10^{18} \text{ electrons} = ?$$

$$\text{or } \frac{1 \text{ electron}}{1.602 \times 10^{-19} C} \times 9.1C = ?$$

? = 5.7×10^{19} electrons

Check for understanding.
 Finish for homework if necessary.

Copy questions into your notebook please.

- An object has received 1.125×10^{19} electrons. What is its charge in Coulombs?
- How many electrons have been lost by an object whose charge is 4.1C. Does the object now have a positive or negative charge?