Chemistry Homework Year 10 into 11

In your final exams, you will be given exam questions on the required practicals so you need to understand what they are.

Overall, there are 8 required practicals that you need to know.

To be well prepared you need to have a thorough understanding of each one, so the earlier you start learning about them, the better you will do in your GCSE Science subjects.

A key point is to understand the independent variable, the dependent variable and the control variables for each required practical.

During this year you will have carried out or have had demonstrated to you, approximately half of the required practicals and these are:

Chemistry

- Making salts
- Neutralisation
- Electrolysis
- Temperature changes

Your Homework

Use your checklists in your books (C1) and watch videos on free science lessons.co.uk relating to the required practicals covered this year.

Write a full method for each one, which includes describing the variables.

Learn about each required practical ready for an exam question on them.

How will you be assessed on this homework?

You will sit a progress check (6 mark question) in the first two weeks of September on this topic.

Useful links:

This is information from the exam board about the required practicals.

https://filestore.aqa.org.uk/resources/chemistry/AQA-8462-PRACTICALS-HB.PDF

Chemistry

Making salts

https://www.youtube.com/watch?v=9GH95172Js8

Neutralisation
https://www.youtube.com/watch?v=saRBT5oZfh8

Electrolysis
https://www.youtube.com/watch?v=ukbtTTG1Kew

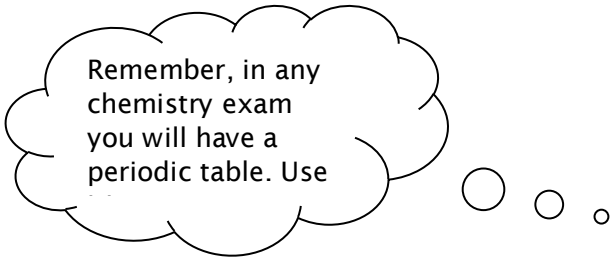
Temperature changes
https://www.youtube.com/watch?v=rdl7xEq4Ew8

Other useful information to learn

See the next page ….

Amazingly basic chemistry revision – things you should already know!!!

Learn these facts and tips off by heart.



Elements, symbols and the periodic table

- The periodic table is a table of elements. An element is a pure substance that contains only one type of atom and cannot be broken down further.

- Each element has its own **symbol**.

- Symbols are either a single CAPITAL LETTER e.g. **S** for sulphur or **O** for oxgyen.

- Or they are a single CAPITAL LETTER followed by a **little letter** e.g. **Br** for bromine, **Na** for sodium.

- If you see something like this in an exam **Ge** there is no excuse for not knowing it's an element! Why? Because it has a CAPITAL LETTER followed by a **little letter**. Obvious or what????

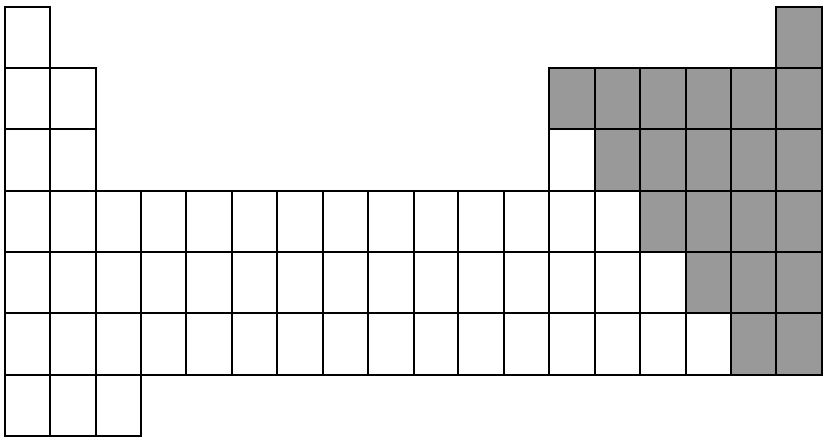
- Also, there is no excuse for thinking that **OH** is an element you've never come across! It is obvious at the very least that it is something that contains the element hydrogen, **H** and the element **O**, which is oxygen. It must be part of a compound or an ion. (It is of course a hydroxide group).

Also – you can always check on your periodic table.

Always write symbols correctly – if you do not, you will lose marks – there is no excuse not to!

Is it a metal or non-metal?

Not sure? No need to be unsure in the exam, you just look on your periodic table and see where it is.



- Everything shaded is a **non-metal**
- Everything else is a **metal**
- Metals are always elements – obvious but true! (Except steel!)

Why not draw a zig-zag line on

Formulae

Compounds contain different elements bonded together to make a new substance.

We show what is in a compound by using a formula. E.g. **H_2O** is the formula for water. It shows that a molecule of water contains two hydrogen atoms and one oxygen atom.

NaCl shows that it contains one sodium and one chlorine

H_2SO_4 shows that it contains two hydrogens, one sulfur and four oxygens

Al_2O_3 shows that it contains two aluminiums and three oxygens

$Mg(NO_3)_2$ shows that it contains one magnesium, two nitrogens and six oxygens

Get this absolutely straight in your heads! Whenever you write a formulae in an equation, the little numbers go on the bottom e.g.

Br_2

Numbers that go on top are only for when you are writing symbols for ions. They do not go into formulae!

Non-metal elements can have formulae too

Quite a few non-metals are gases. Except for group 0, the Noble gases, all the other gases you commonly come across are molecules. Two atoms of the element are bonded together to make a molecule. You show this by writing a formulae for the elements e.g.

$$H_2 \quad O_2 \quad N_2 \quad Cl_2 \quad F_2$$

Also, although bromine is a liquid at room temperature and iodine is a solid, they still form molecules made of two elements so can have a formula:

$$Br_2 \qquad I_2$$

Always remember, if you are writing about hydrogen gas in an equation, or chlorine coming off at the anode during electrolysis, it will need to be H_2 or Cl_2. If you just give the symbol you will lose a mark. Use your common sense!

Halogens and halides – or how to lose marks really, really easily!

If you look at group 7 in the periodic table you will see that all the halogen elements have the ending **ine**, e.g. brom**ine**, iod**ine**. Whenever you are talking about the **element** it will have the ending **ine**.

Compounds which contain halogens **or halogen ions (halide ions)** have the ending **ide**.

E.g. sodium iod**ide** or the chlor**ide** ion.

Do **not** get these muddled up!

Some common formulae that you should know

H_2O	water	**CO_2**	carbon dioxide

CO	carbon monoxide	**H_2SO_4**	sulfuric acid
HNO_3	nitric acid	**NaOH**	sodium hydroxide
KOH	potassium hydroxide	**NH_3**	ammonia
SO_2	sulfur dioxide	**CH_4**	methane
NaCl	sodium chloride	**$CaCO_3$**	calcium carbonate

HCl Either a gas called hydrogen chloride, but when dissolved in water, hydrochloric acid

Some common groups you need to know about

There are some groups that you need to be able to recognise in formulae

~NO_3 a nitrate group, e.g. $NaNO_3$ is sodium nitrate

~SO_4 is a sulfate group, e.g. K_2SO_4 is called potassium sulphate

~OH is a hydroxide group e.g. NaOH is sodium hydroxide. These are alkalis if soluble in water, or bases if not.

~CO_3 is a carbonate group, e.g. $CuCO_3$ is called copper carbonate

More every day facts about metal ions and non-metal ions

- Ions are charged.

- Metal ions are always positive. You can often work out the charge by seeing where the element is in the periodic table. For example, Ca^{2+} has a charge of +2. The element calcium is in group 2. This means that calcium has two electrons in the outer shell. The easiest way for calcium to have a full outer shell is to lose two electrons. This means that it is left with a positive charge of +2.

- You cannot use this rule for transition metals. But most iron ions are Fe^{3+} with a few being Fe^{2+}. Most copper ions are Cu^{2+} but a few are Cu^{+}.

- Non-metal ions are usually negative. The only exception is hydrogen, H^{+}. An ammonium ion is made from the elements nitrogen and hydrogen, NH_4^{+}.

- Metal compounds, e.g. copper sulfate, always have ionic bonding (i.e. they are made up of ions bonded together with ionic bonding). As far as you are concerned, ions never, ever get themselves mixed up with molecules! The two do not go together!

- Non-metal compounds, e.g. hydrogen chloride, sulfur dioxide, tend to be made of molecules and have covalent bonding. Not always though!

- Non-metal ions which come from elements will have negative charges, except for hydrogen. You can tell the charge from the group on the periodic table. For example, sulfur is in group 6. To get a full outer shell of eight electrons it needs to attract two more negative electrons, hence it gets a negative charge of –2 and is called a sulfide ion, S^{2-}.

Opposites attract!

- Positive ions, i.e. metal ions, will always be attracted to the negative electrode, called the cathode, during electrolysis.

- Negative ions will always be attracted to the positive electrode, called the anode, during electrolysis.

- You need to learn the charges on the common ions mentioned earlier.

NO_3^{-} nitrate ion, -1

SO_4^{2-} sulfate ion, -2

OH^{-} hydroxide ion, -1

CO_3^{2-} carbonate ion, -2