

To find the number of neutrons in the atom, subtract the proton (atomic) number from the mass number.

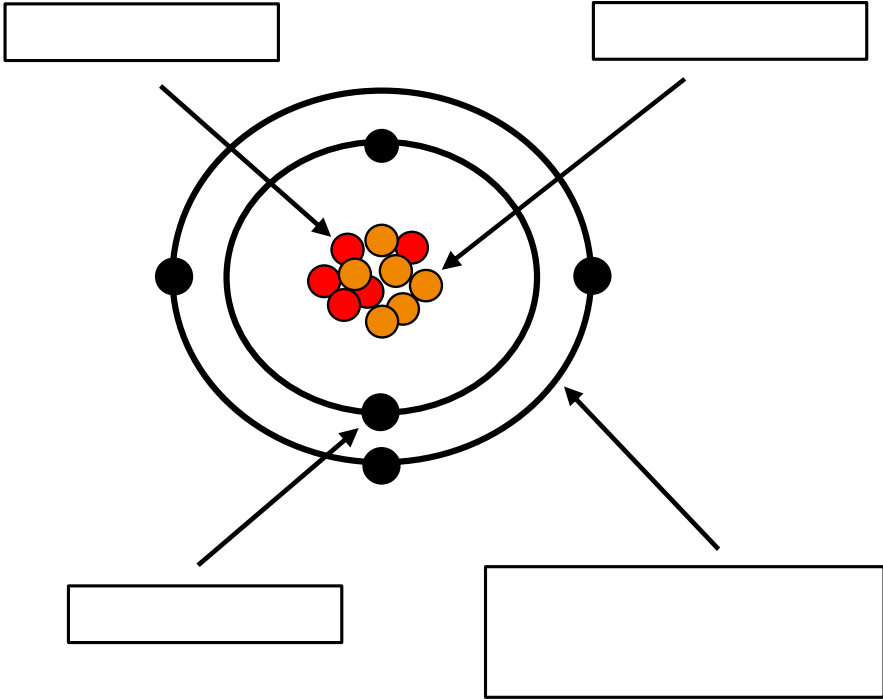
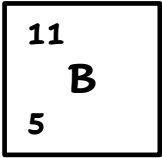
How many electrons are there in an atom of sodium if there are 11 protons?

How many neutrons are there if an atom has 20 protons and a mass number of 40?

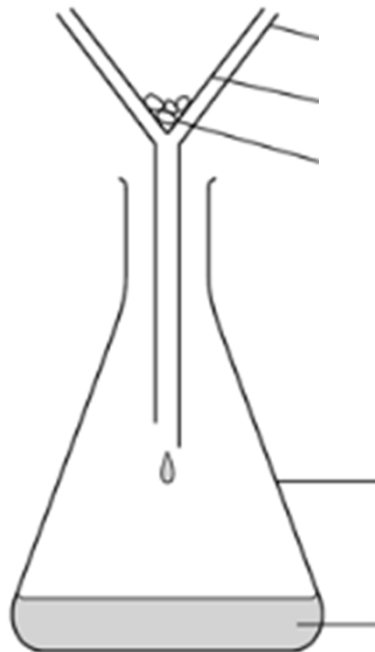


Can you fill in the table?

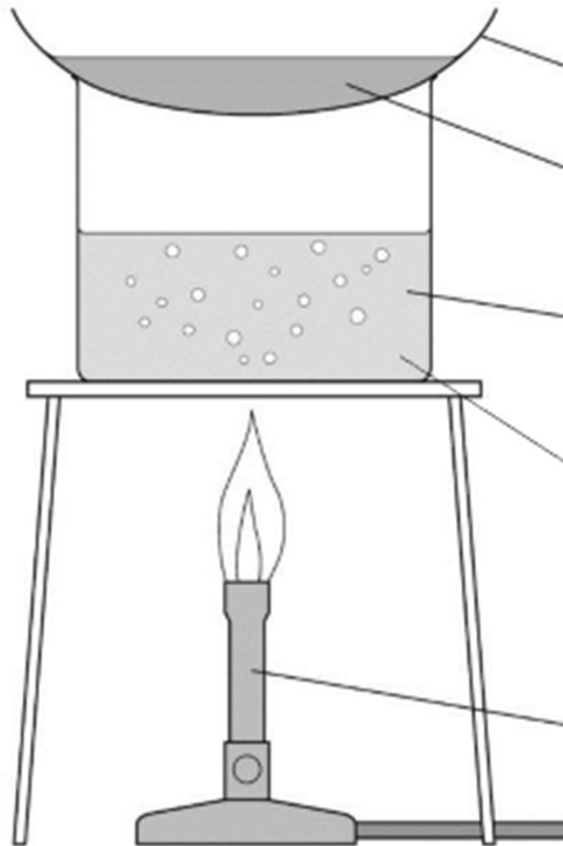
Particle	Relative charge	Relative mass
Proton	<input type="text"/>	<input type="text"/>
Neutron	<input type="text"/>	<input type="text"/>
electron	<input type="text"/>	<input type="text"/>



FILTRATION



CRYSTALLISATION



COMPOUNDS BLANKETY BLANK

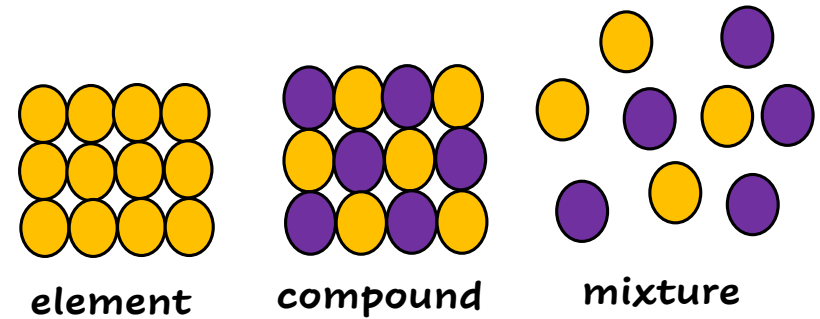
When elements react, they come together to form . Compounds are substances that are formed from elements which are held together by bonds. When bonds are formed between elements, are shared or transferred, and a new is made. Unlike physical separating techniques such as and evaporation, it is difficult to separate the original elements, so we need a chemical to do this.

Some bond types you need to know:

IONIC BOND – Formed between a metal and a non-metal. bonds are formed from electrons from the metal to the non-metal. The metal forms a ion, and the non-metal forms a ion.

COVALENT BOND – formed between non-metals. These bonds are very , and electrons are between the non-metals.

In both cases, the properties of the original elements are different from the compounds formed.



electrons

chemical

ionic

shared

negative

reaction

transferring

two or more

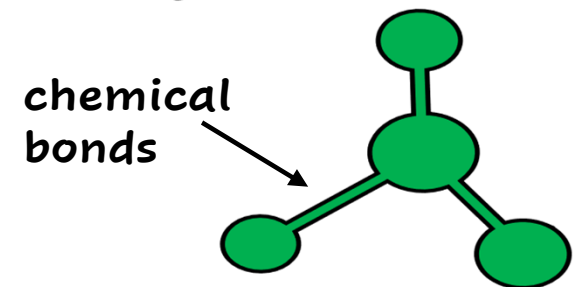
compounds

bond

positive

strong

filtration



PRACTICAL MAKING SOLUBLE SALTS!

SAFETY
Wear goggles.

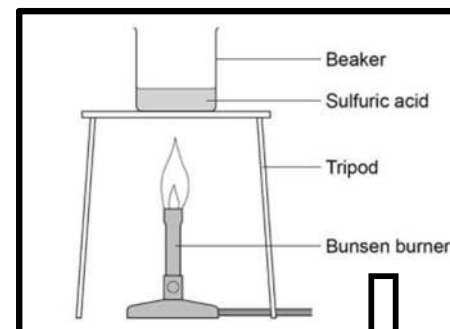
Soluble salts can be made by reacting an with a metal or an base (metal oxide, metal hydroxide or metal carbonate). When making a salt it is important that the appropriate reagents are chosen. You can do this by working out what reagents you need by knowing the name of the you want to produce.

Here's how its done.

This example involves making copper sulfate (CuSO_4).

1. Add insoluble copper oxide (CuO) to sulfuric acid (H_2SO_4) and stir. Warm gently on a and gauze.
2. The solution will turn blue as the reaction occurs. Showing that copper sulfate is being formed.
3. On of the reaction, off the solution to remove the excess copper oxide.
4. the water so that crystals of copper sulfate form. Stop heating when the first start to appear.
5. Leave for the rest of the water to evaporate off slowly to give larger crystals. Any small excess of on the crystals can be removed by dabbing between filter papers.
6. Leave to

Warm
gently



excess

acid

solution

filter

completion

salt

crystals

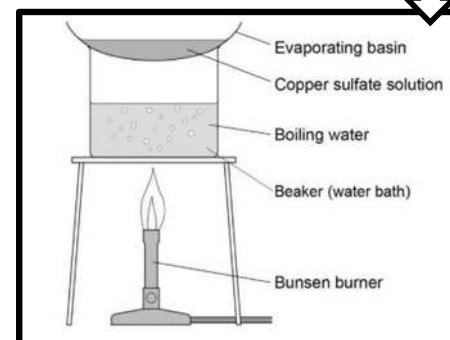
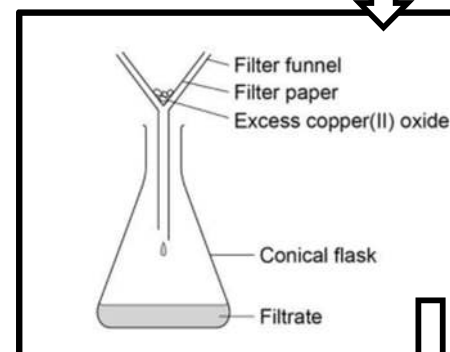
tripod

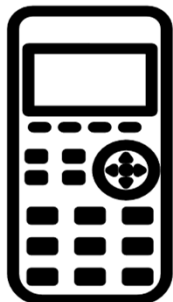
dry

insoluble

evaporate

soluble



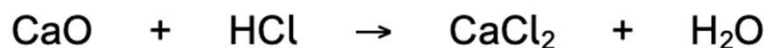
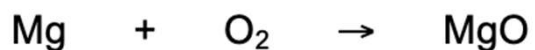


How to calculate relative atomic mass

Element	Isotopes	Abundance	Relative atomic mass (A_r) (to 3sf)
Chlorine	$^{35}_{17}\text{Cl}$	75.8%	$A_r = \frac{[(35 \times 75.8) + (37 \times 24.2)]}{75.8 + 24.2} = \frac{3548.4}{100} = 35.5 \text{ (3sf)}$
	$^{37}_{17}\text{Cl}$	24.2%	
Lithium	^6_3Li	7.6%	
	^7_3Li	92.4%	
Bromine	$^{79}_{35}\text{Br}$	50.7%	
	$^{81}_{35}\text{Br}$	49.3%	
Copper	$^{63}_{29}\text{Cu}$	69.2%	
	$^{65}_{29}\text{Cu}$	30.8%	

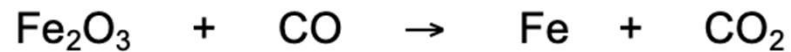


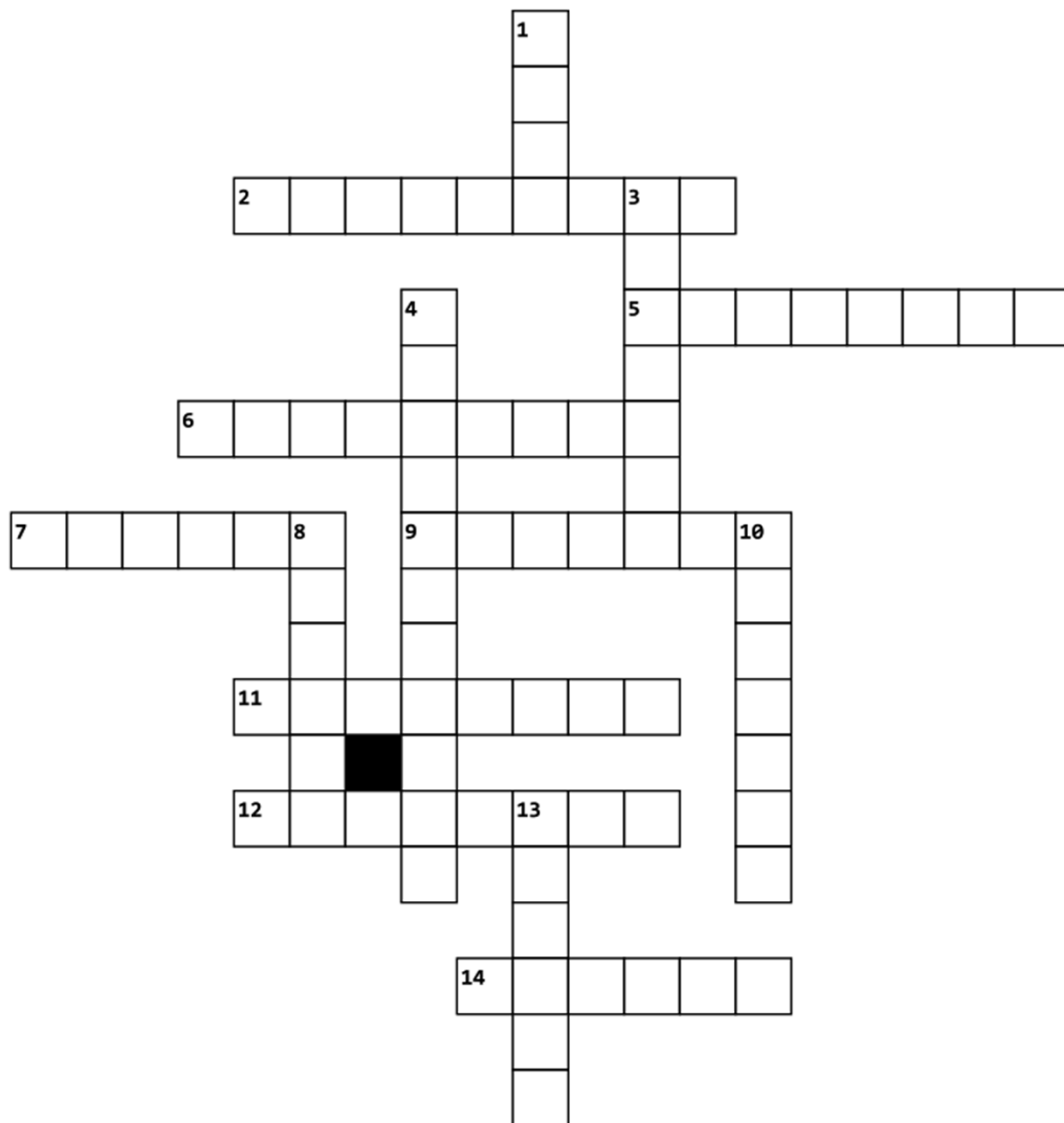
BALANCE THE FOLLOWING EQUATIONS



What is happening in terms of particles/molecules/compounds during the reaction here?

2 atoms of magnesium react with one molecule of oxygen to give two molecules of magnesium oxide.





Across

2. Found in the outer shell of atoms and determine which group the element is in
5. Scientist who discovered the neutron
6. A property of metals meaning they can be bent into particular shapes
7. An arrangement in the periodic table where elements have similar properties
9. The scientist who discovered the electron
11. A negatively charged sub-atomic particle
12. Elements with the same number of protons but a different mass number/number of neutrons
14. The number for how the periodic table is arranged

Down

1. The scientist who proposed electrons orbit the nucleus
3. The central part of an atom
4. Metals conduct this very well
8. Fixed paths where electrons orbit the nucleus
10. A sub-atomic particle with no charge
13. Positively charged particle in the nucleus

SWJ TUITION



NAME _____

1. Which subatomic particle has a **+1 charge** and a **mass of 1**?

- a. Electron
- b. Proton
- c. Neutron
- d. Positron

2. Where are **protons and neutrons** found in an atom?

- a. In the nucleus
- b. In energy levels
- c. In the electron cloud
- d. In the outer shell

3. The **small number** on the periodic table represents:

- a. Mass number
- b. Atomic number
- c. Number of neutrons
- d. Relative atomic mass

4. Isotopes are atoms of the same element with:

- a. Same number of protons, different number of neutrons
- b. Different number of protons, same number of neutrons
- c. Same number of electrons, different number of protons
- d. No neutrons at all

5. To calculate **relative atomic mass**, you:

- a. Multiply mass number by relative abundance, add, divide by 100
- b. Add atomic number and mass number
- c. Divide mass number by atomic number
- d. Multiply atomic number by abundance

6. When elements react, they form:

- a. Mixtures
- b. Compounds
- c. Isotopes
- d. Solutions

7. In an **ionic bond**, electrons are:

- a. Shared between atoms
- b. Transferred from metal to non-metal
- c. Lost by non-metals
- d. Gained by metals

8. After forming an ionic bond, a **metal** becomes:

- a. Neutral
- b. Positively charged
- c. Negatively charged
- d. Unchanged

9. Filtration is used to:

- a. Separate a soluble solid from a liquid
- b. Separate an insoluble solid from a liquid
- c. Evaporate a solvent
- d. Separate liquids with different boiling points

10. Which method involves heating a solution until **dry crystals** remain?

- a. Crystallisation
- b. Evaporation
- c. Distillation
- d. Chromatography

11. The key difference in **crystallisation** is:

- a. Cooling the solution after heating to form crystals
- b. Heating until all solvent is gone
- c. Using a condenser
- d. Filtering before heating

12. **Simple distillation** is used to:

- a. Separate a soluble solid from a liquid and collect the liquid
- b. Separate insoluble solids
- c. Separate gases
- d. Separate immiscible liquids

13. In **paper chromatography**, substances move up the paper because of:

- a. Density differences
- b. Solubility in the solvent
- c. Gravity
- d. Magnetic attraction

14. Why must the **pencil line** in chromatography be above the solvent?

- a. To stop the spots dissolving into the solvent
- b. To make the paper absorb faster
- c. To prevent evaporation
- d. To keep the paper flat

0 3

This question is about making a soluble salt.

0 3 . 1

Plan a method to make pure, dry crystals of zinc chloride from zinc carbonate and a dilute acid.

[6 marks]

0 3 . 2

Name **two** other substances that can each be reacted with a dilute acid to make zinc chloride.

Do **not** refer to zinc carbonate in your answer.

[2 marks]

1 _____

2 _____

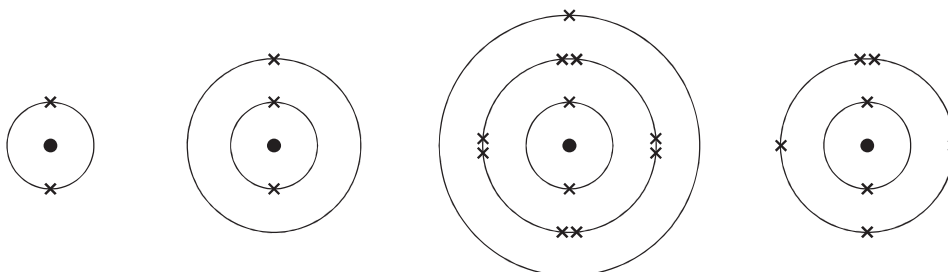
—
8

Turn over ▶



Answer **all** questions in the spaces provided.

1 The diagrams show the electronic structure of four different atoms.



Atom A

Atom B

Atom C

Atom D

Use the Chemistry Data Sheet to help you to answer these questions.

1 (a) Name the two sub-atomic particles in the nucleus of an atom.

.....
(1 mark)

1 (b) Why is there no overall electrical charge on each atom?

.....
.....
(1 mark)

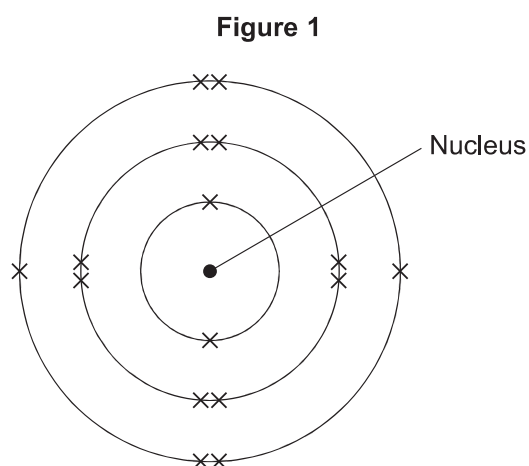
1 (c) Why is **Atom A** unreactive?

.....
(1 mark)

1 (d) Which **two** of these atoms have similar chemical properties?
Give a reason for your answer.

.....
.....
.....
.....
(2 marks)

1 (d) **Figure 1** shows the electronic structure of an atom of a non-metal.



What is the chemical symbol of this non-metal?

[1 mark]

Tick (✓) **one** box.

Ar

O

S

Si

1 (e) When elements react, their atoms join with other atoms to form compounds.

Complete the sentences.

1 (e) (i) Compounds formed when non-metals react with metals consist of particles called

[1 mark]

1 (e) (ii) Compounds formed from only non-metals consist of particles called

[1 mark]