



# Chemistry

## 1. Atomic structure and the periodic table

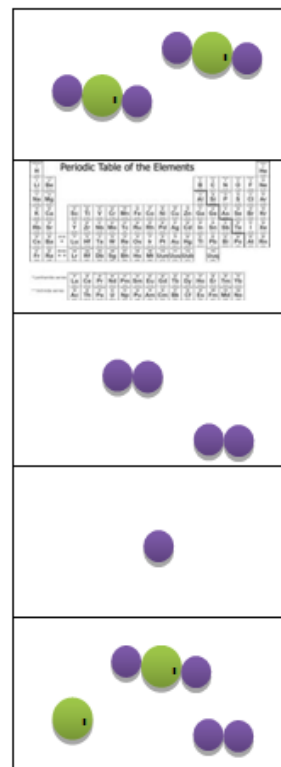
### Revisiting Booklet

Name:

Match the definitions to the key-words and the key-words to the images.

Substances with only one type of atom are called
Substances which are not chemically bonded
Substances are made of more than one type of atom bonded together
The smallest particles which substances can be broken down to
A place where a list of all the elements can be found

Periodic table
Elements
Atom
Compounds
Mixtures



**Q2.** There are millions of different substances that make up our world. All these substances are made from chemical elements.

(a) What is an element?

.....

.....

.....

.....

(1)

(b) Many substances are compounds. What is a compound?

.....

.....

.....

.....

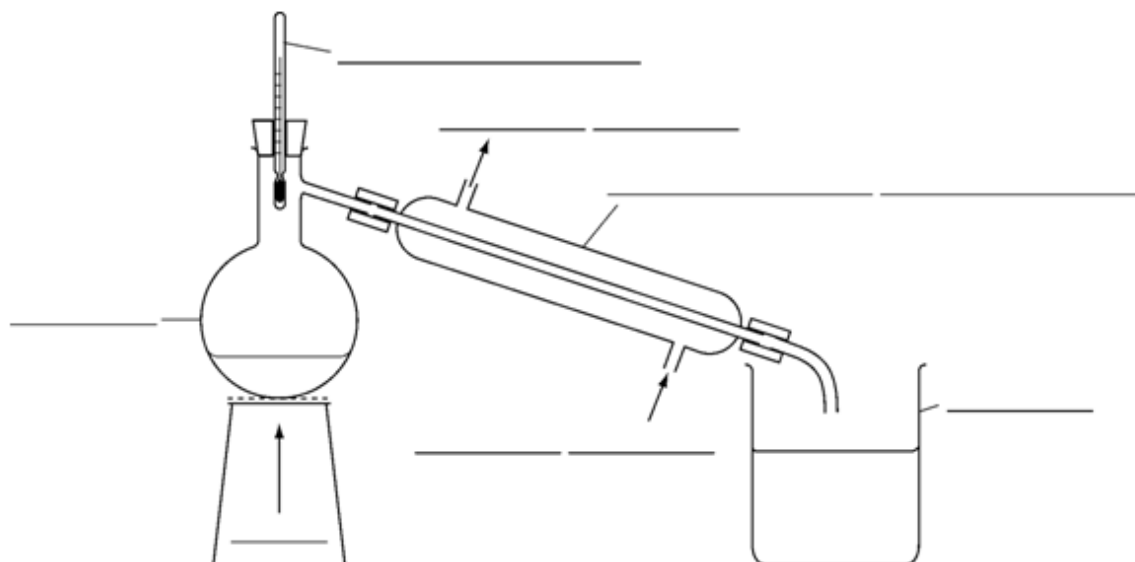
(2)

(Total 3 marks)

## Separating mixtures:

### Distillation:

Label the parts of the distillation apparatus shown below, using words from the box.



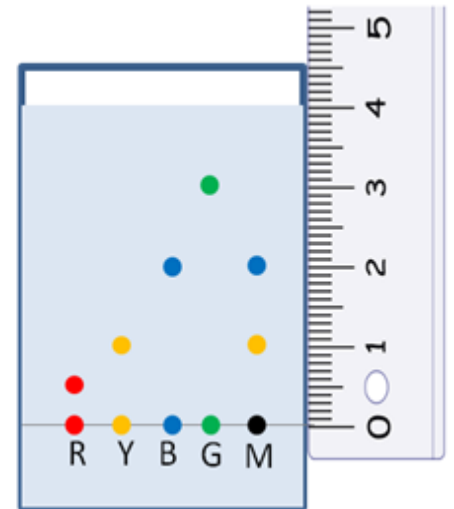
Beaker   flask   heat   Liebig condenser   thermometer   water in   water out

The above process is also used in fractional distillation for crude oil, describe the three main steps to distillation:

- 
- 
-

## Chromatography:

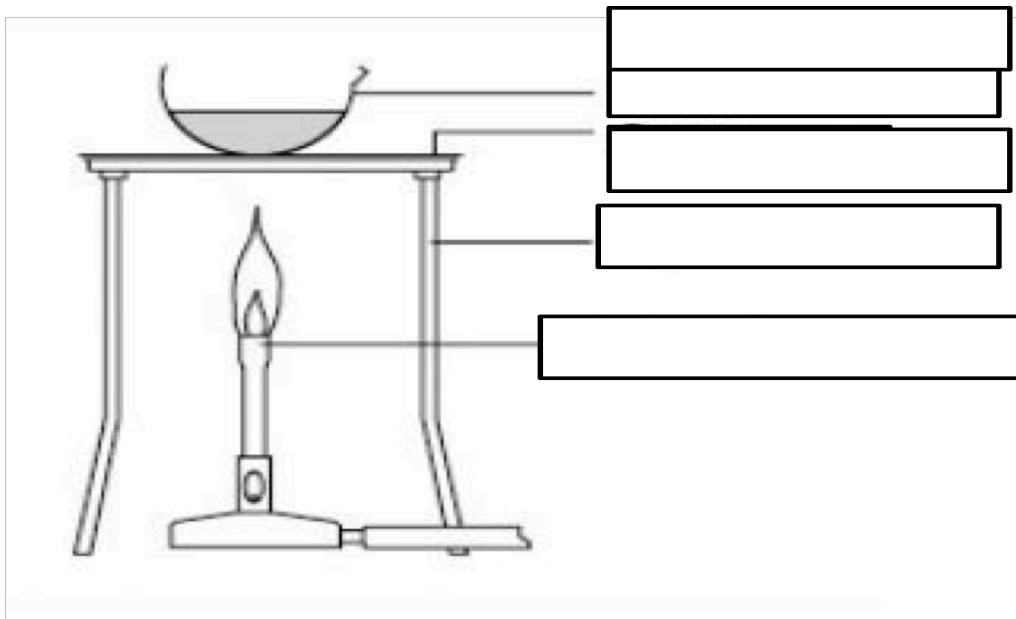
1. Identify which components R, Y, B and G are in the M mixture.
2. Calculate the R<sub>f</sub> value of the blue substance:  
\_\_\_\_\_



What is chromatography used for?

.....  
.....

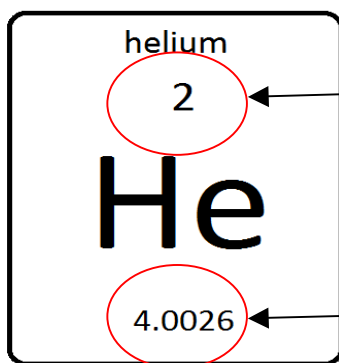
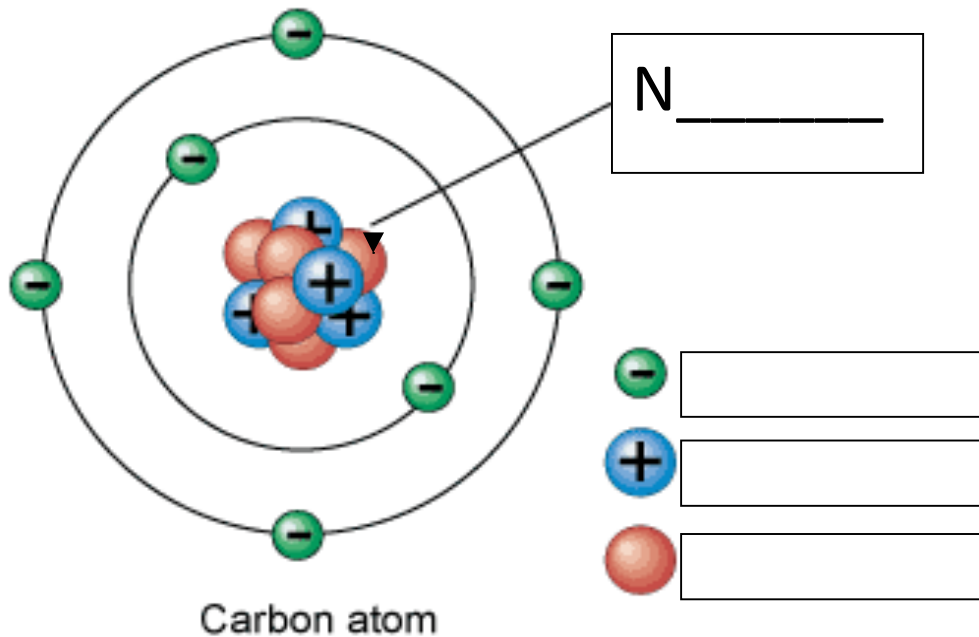
## Filtration:



**Separation technique**  
name: \_\_\_\_\_

*This technique separates a solution to get out the* \_\_\_\_\_

## Electronic structure



What does this number represent?

What does this number represent?

What is the mass and charge of these subatomic particles?

	Mass	Charge
Proton		
Electron		
Neutron		

1. Which element has the electronic structure 2.8.6 ?

.....

2. Name an element with only one electron in its outer shell

.....

3. The atomic number of silicon is 14 – what does this mean?

.....

.....

4. Name an element with 6 electrons in its outer shell

.....

5. Name an element with 8 electrons in its outer shell

.....

6. Which period does sulphur belong?

.....

7. Draw the electronic structure of a silicon atom

8. **Define**

a. mass number:

.....

b. Proton number:

.....

c. Isotope:

.....

9. What is a displacement reaction?

.....

10. Why is fluorine more reactive than bromine?

.....

11. What is a covalent bond?

.....

12. Draw a dot-and-cross diagram to show the bonding in chlorine, Cl<sub>2</sub>

## **The periodic table**

3: State the similarities and differences in the properties of group 1 and 7 elements.

5: Explain how the atomic structure of the elements in group 1, 2 and 7 and 8 affect its properties.

7: Predict possible reactions between the different groups in the periodic table.

What is the name of the group 1 metals?

.....  
.....

Why does reactivity increase down group 1?

.....  
.....

What is similar about elements across a period?

.....  
.....

How many electrons do group 2 elements have in their outer shell?

.....  
.....

How is the modern periodic table arranged?

.....  
.....

How did Mendeleev organise the periodic table?

.....  
.....

**What did J.J. Thompson's plum pudding model show?**

.....  
.....  
.....  
.....

**What did Rutherford's model show? ( hint Alpha scattering)**

.....  
.....  
.....  
.....

**What did Neil Bohr discover?**

.....  
.....  
.....  
.....



## Metals and non-metals:

Describe the structure of a metal ( draw a diagram to help you; make sure you label it).

List the properties that metals have:

- 
- 
- 
- 
- 
- 
- 

List the properties that non-metals have:

- 
- 
- 
- 
- 
-

## Group 0:

### Complete the DART!

1. Elements in group 0 have \_\_\_ electrons in their outer shell
2. Helium is different and has \_\_\_ electrons in its outer shell
3. All elements in Group 0 have a \_\_\_\_\_ outer shell.
4. Elements in group 0 are **reactive/unreactive** because \_\_\_\_\_.
5. As you move down the group the energy needed to turn Group 0 elements into a gas increases. Another word for this is \_\_\_\_\_ point, which increase as you move down the group.

## Group 1

### Complete the DART!

Also known as ...the \_\_\_\_\_ metals.

They have \_\_\_ electron in their outer shell.

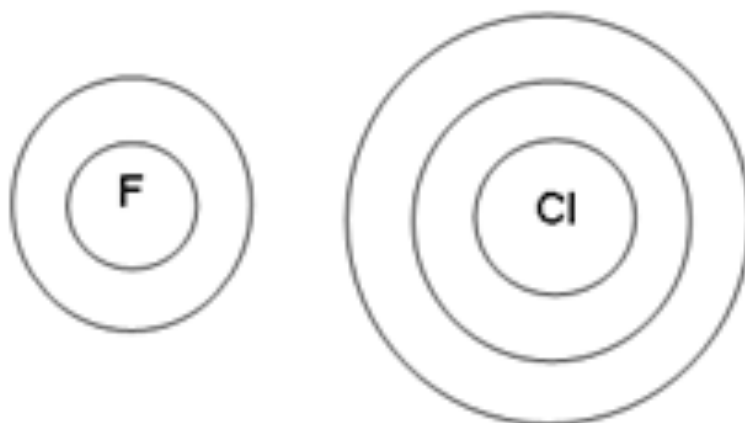
Properties:

- soft - can be cut with a \_\_\_\_\_ knife
- conduct \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_ when freshly cut
- In moist air the freshly \_\_\_\_\_ surface \_\_\_\_\_ easily as they react easily with \_\_\_\_\_ in the air (\_\_\_\_\_)

To avoid this they are kept in \_\_\_\_\_

## Group 7:

Fill the electron shells of the two halogens below, by adding the correct number of electrons in each shell.



Can you list the uses and properties of any elements in group 7?

.....

.....

.....

.....

.....

Exam questions:

1.

This diagram shows part of the Periodic Table.

					He
Li	Be		C		Ne
Na	Mg			Cl	Ar
K	Ca			Br	

(a) (i) Which three elements shown in the diagram are in the same **group**?

Put a tick (✓) in the box next to the correct answer.

- |    |    |    |                          |
|----|----|----|--------------------------|
| Be | C  | He | <input type="checkbox"/> |
| Na | Mg | Ar | <input type="checkbox"/> |
| He | Be | Ar | <input type="checkbox"/> |
| Li | Na | K  | <input type="checkbox"/> |

[1]

(ii) Which three elements shown in the diagram are in the same **period**?

Put a tick (✓) in the box next to the correct answer.

- |    |    |    |                          |
|----|----|----|--------------------------|
| Na | Mg | Ar | <input type="checkbox"/> |
| Li | Na | Ca | <input type="checkbox"/> |
| He | Ne | Ar | <input type="checkbox"/> |
| Na | Ca | Br | <input type="checkbox"/> |

[1]

3.

The diagram shows an outline of the Periodic Table.

- (a) Complete the labels by filling in the missing words.  
Choose words from this list.

liquid

group

period

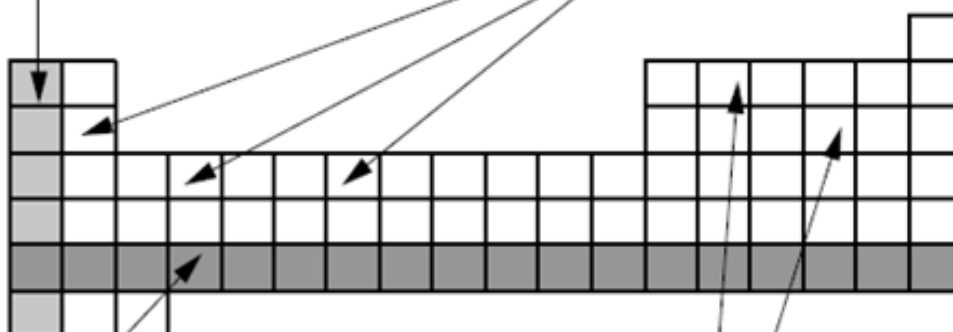
metal

non-metal

series

Each vertical column  
is called a.....

Every element in this part of the table  
is a .....



Each horizontal row is  
called a .....

Every element in this part of the table  
is a .....

[3]



## Mark scheme:

- M2. (a) a substance which contains one type of atom  
or a substance that cannot be **broken down**  
into anything simpler

*for 1 mark*

1

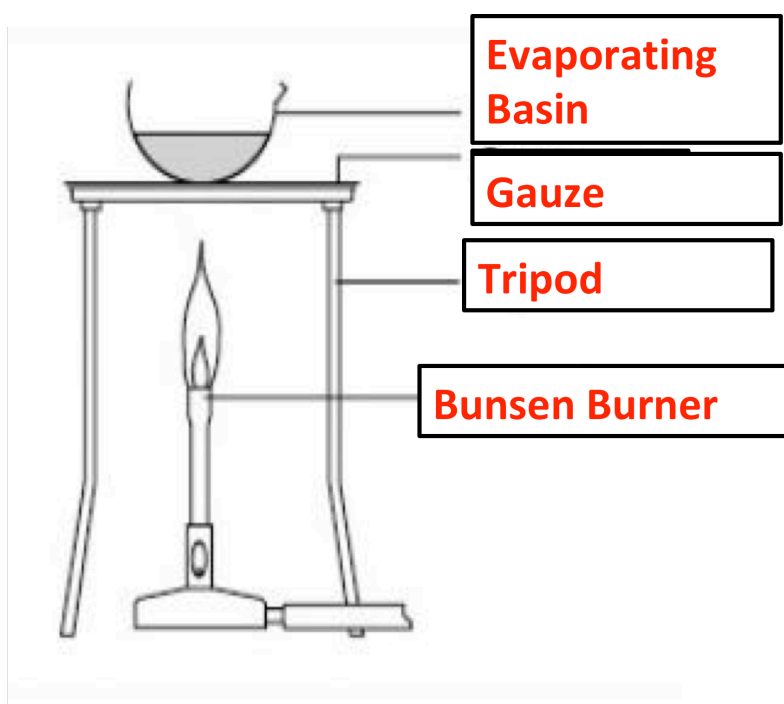
- (b) more than one element/more than one type of atom  
combined/join together/bonded

*for 1 mark each*

2

## Three steps for distillation:

- Heat solution
- Solution will vapourise and condense
- Collection of fractions or solvent.



Separation technique

name: **Evaporation**

*This technique separates a solution to  
get out the* **Soluble solid**

