

Name:
Science Class:
Teacher:
Hand in day:

Y7 Science

Term 3: Homework Booklet

Chemistry

	Hand in Date	Parents Signature
Separating Mixtures		
Homework 1		
Homework 2		
Homework 3		
Homework 4		
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Separating Mixtures Homework 1:

Comprehension Task

Mixtures

A mixture contains different substances that are not chemically joined to each other. For example, a packet of sweets may contain a mixture of different coloured sweets. The sweets are not joined to each other, so they can be picked out and put into separate piles.



A mixture of iron filings and sulfur powder can easily be separated using a magnet. The iron filings are attracted to the magnet but the sulfur powder is not.



Dissolving

Dissolving is one way to make a mixture. For example, when salt is stirred into water, the salt dissolves in the water to make salt solution. In a solution:

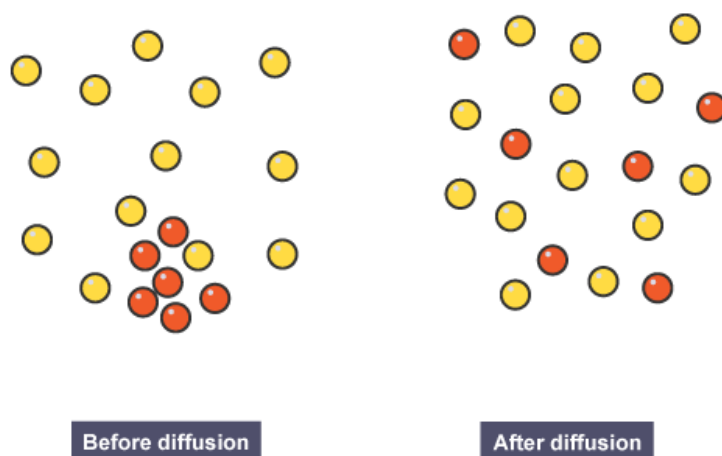
- the substance that dissolves is called the solute
- the substance that the solute dissolves in is called the solvent

In salt solution, salt is the solute and water is the solvent. The particles of solute and solvent are completely mixed together.

Diffusion

Diffusion is another way to make a mixture. Particles of different substances mix together during diffusion. This happens:

- quickly in gases, because their particles are able to move quickly in all directions
- slowly in liquids, because their particles can move around each other, and they can push other particles around
- not at all in solids because their particles can only vibrate on the spot



Diffusion explains why the smell of cooking spreads through the house, and why a drop of paint spreads on its own through a jar of water.

Questions

1. What does a mixture contain?
2. Why can the different coloured sweets be separated easily?
3. What could be used to separate iron from a mixture of iron and sulfur? Why does this work?
4. What can be added to solid salt to get it to dissolve?
5. When salt dissolves in water, what does it make?
6. What is the special name for the solid that dissolves?
7. What is the special name for the liquid that it dissolves in?
8. What word is used to describe the spreading out of gas particles?
9. Why does diffusion occur quickly in gases?
10. Why does diffusion not occur in solids?

Separating Mixtures Homework 2:

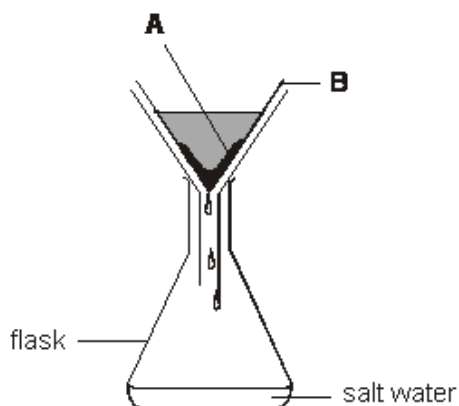
Learn the spellings of the following key words and their meanings.

Word	Meaning
Solvent	A liquid in which something dissolves
Solute	A substance that can dissolve in a liquid.
Dissolve	When a solute mixes completely with a solvent.
Solution	Mixture formed when a solvent dissolves a solute.
Soluble	Property of a substance that will dissolve in a liquid.
Insoluble	Property of a substance that will not dissolve in a liquid.
Solubility	Maximum mass of solute (solid) that dissolves in a certain volume of solvent (liquid).
Pure substance	Contains only one type of element or compound.
Mixture	Two or more substances mixed together but not chemically joined.
Filtration	Separating an insoluble solid from a liquid using a filter to produce a filtrate (solution) and a residue.
Distillation	Separating a solvent from a solution, by boiling and then condensing the vapours.
Fractional distillation	Separating mixtures into fractions with different boiling points
Evaporation	A way to separate a solid dissolved in a liquid by the liquid turning into a gas.
Chromatography	Used to separate different substances dissolved in a liquid

You will have a short test on this revision in class

Chris collected some sea water near a beach.
The sea water had salt dissolved in it. It had sand mixed in it.

(a) Chris separated the sand from the salt water as shown below.



(i) What is this method of separation called? Tick the correct box.

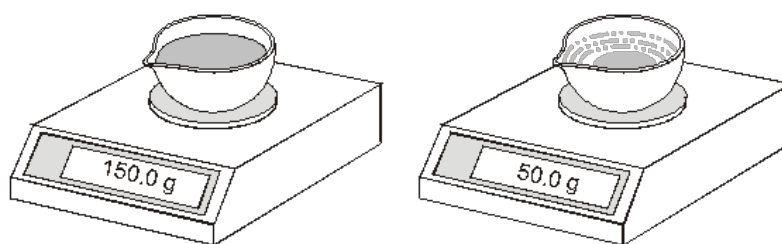
chromatography	<input type="checkbox"/>	distillation	<input type="checkbox"/>
filtration	<input type="checkbox"/>	evaporation	<input type="checkbox"/>

(ii) What is substance A?.....

(iii) What is the part labelled B?.....

3 marks

(b) Chris poured some of the salt water from the flask into a dish.
He put the dish on a balance and left it in a warm room for a week.



(i) Look at the two readings on the balance. Work out the decrease in mass.

..... g

(ii) After one week there was a white solid but **no** liquid in the dish.
What had happened to the water in the dish?

.....

(iii) What was the white solid left in the dish?

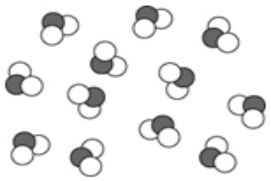

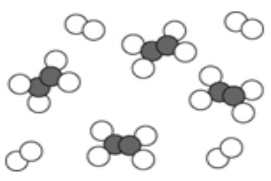
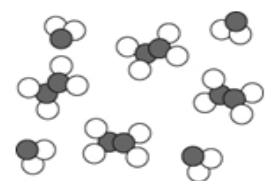
.....

3 marks
maximum 6 marks

Separating Mixtures Homework 3:

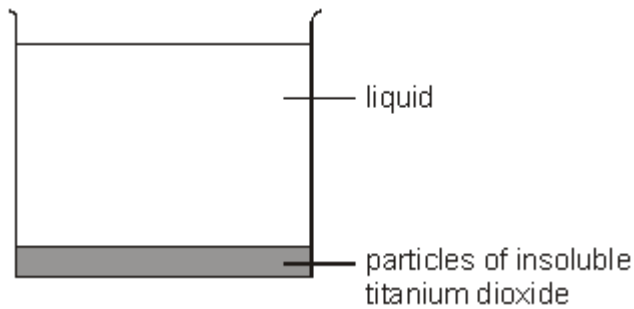
1 A natural substance can be a pure element, a pure compound, a mixture of elements, a mixture of compounds or a mixture of elements and compounds.

Tick the correct boxes to classify each substance shown in the particle drawings below.

<p>a</p> 	<input type="checkbox"/> pure <input type="checkbox"/> mixture <input type="checkbox"/> element <input type="checkbox"/> compound	<p>b</p> 	<input type="checkbox"/> pure <input type="checkbox"/> mixture <input type="checkbox"/> element <input type="checkbox"/> compound
<p>c</p> 	<input type="checkbox"/> pure <input type="checkbox"/> mixture <input type="checkbox"/> element <input type="checkbox"/> compound	<p>d</p> 	<input type="checkbox"/> pure <input type="checkbox"/> mixture <input type="checkbox"/> element <input type="checkbox"/> compound

(a) Samantha opened a tin of white paint. The paint consisted of a liquid and particles of titanium dioxide that are insoluble in the liquid.

The paint had separated into two layers, as shown below.



(i) What type of substance is the paint? Tick the correct box.

compound element mixture

1 mark

(ii) What type of substance is titanium dioxide? Tick the correct box.

compound element mixture

1 mark

(iii) Why did the particles of insoluble titanium dioxide sink to the bottom?

.....

1 mark

- (b) Samantha stirred the paint and used it to paint a window frame. She got some of the paint on the glass.



Samantha could **not** get the paint off the glass with water. When she used a different liquid called white spirit the paint came off.

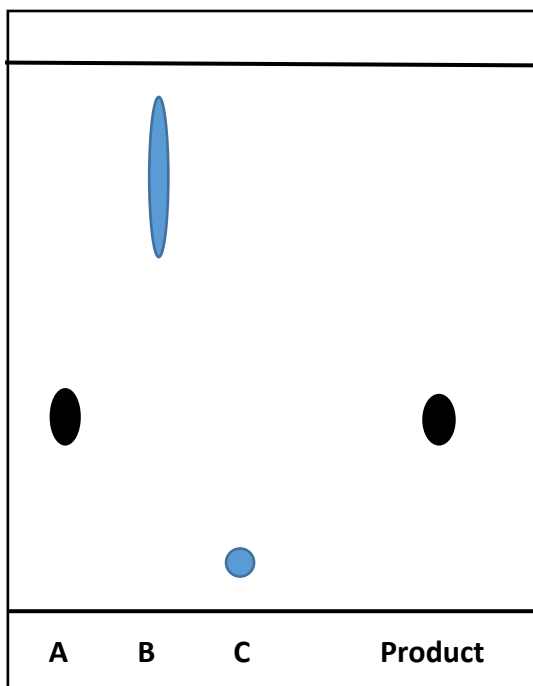
Why could she remove the paint with white spirit but **not** with water?

.....
.....

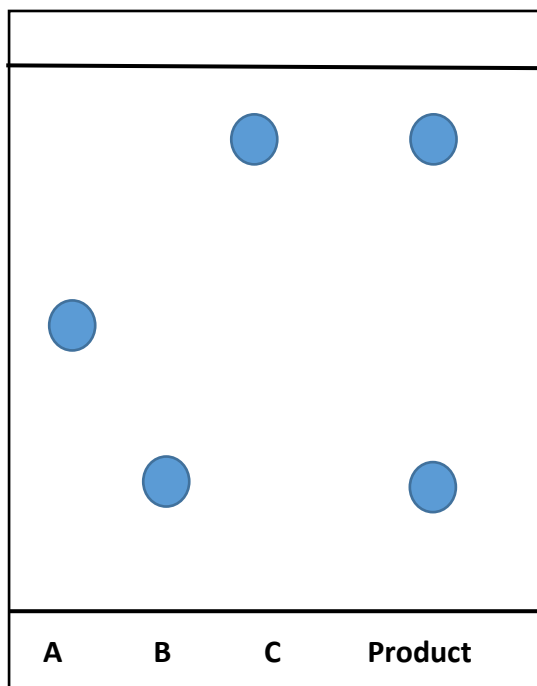
1 mark
maximum 4 marks

Separating Mixtures Homework 4:

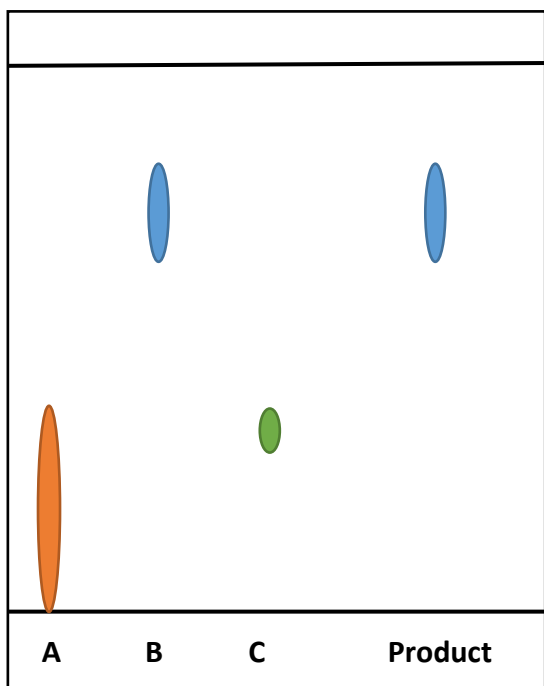
Interpreting a chromatogram – Can you identify what the product is made from - A, B, C, is it a pure substance or a mixture?



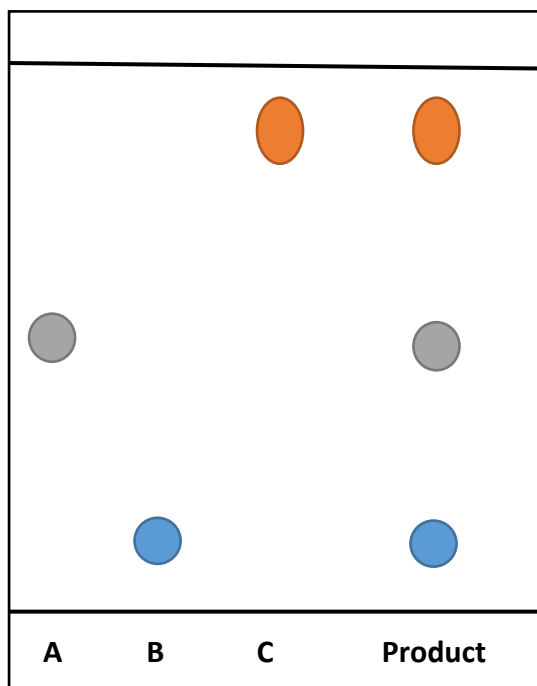
Product is made from.....
 Pure or mixture.....



Product is made from.....
 Pure or mixture.....

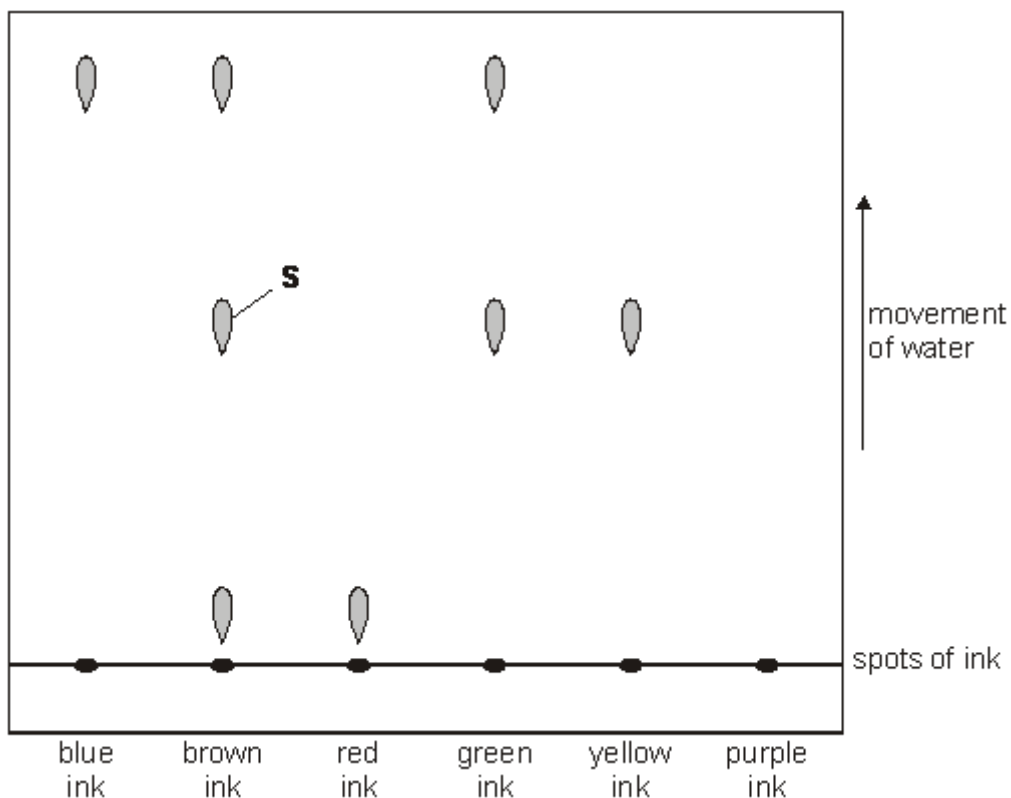


Product is made from.....
 Pure or mixture.....



Product is made from.....
 Pure or mixture.....

A pupil used chromatography to show which dyes are present in different coloured inks. The diagram shows some of her results. The results for purple ink are missing.



(a) (i) Give the colour of an ink which contains only **one** dye.

..... 1 mark

(ii) Give the colour of an ink which contains **three** dyes.

..... 1 mark

(iii) The purple ink is a mixture of the red and blue inks. On the diagram, draw the results you would expect from purple ink.

1 mark

(b) What would be the colour of the spot labelled S?

..... 1 mark

(c) Why should the start line be drawn in pencil, not pen?

.....

1 mark
 Maximum 5 marks

Separating Mixtures Homework 5:

Learn the following methods for separating mixtures, what they are used to separate and an example of each.

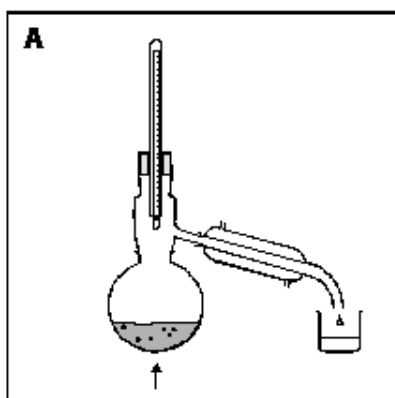
Method	Used to separate	Apparatus used	Examples
Filtering (filtration)	An insoluble solid from a liquid		<ul style="list-style-type: none"> separating sand from a mixture of sand and water
Evaporation (or crystallisation)	A soluble solid from a liquid (useful when you only want the solid)		<ul style="list-style-type: none"> separating salt from salt solution
Distillation (evaporation followed by condensation)	A solvent from a solution (useful when you want to keep the liquid as well as the solid)		<ul style="list-style-type: none"> separating pure water from a salt solution
Fractional distillation	Mixtures with different boiling points into fractions, as they condense at different temperatures (useful when you want to keep both the liquids)		<ul style="list-style-type: none"> separating two liquids with different boiling points eg. alcohol (78°C) and water (100°C) separation of crude oil into useful substances
Chromatography	Different coloured substances in a mixture		<ul style="list-style-type: none"> separation of colours found in ink

Diagrams A, B and C show three pieces of apparatus for separating substances.

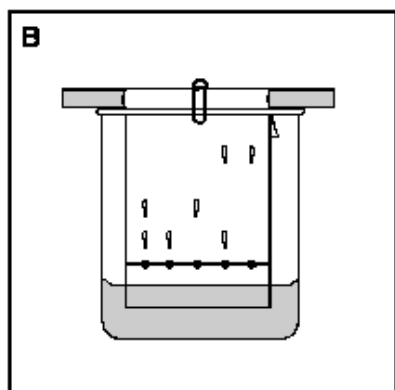
- (a) Draw a line from each apparatus to the name of the method of separation.
Draw only three lines.

diagram of apparatus

method of separation

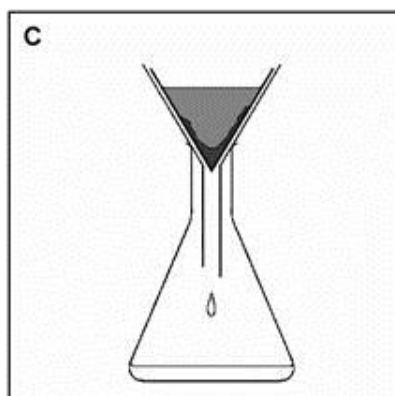


chromatography



distillation

filtration



crystallisation

3 marks

(b) Debbie has a mixture of sand and salt water.
Look at the diagrams in part (a).

(i) Which apparatus would Debbie use to separate the sand from the salt water?
Give the correct letter.

.....

1 mark

(ii) Which apparatus would she use to separate pure water from the salt water?
Give the correct letter.

.....

1 mark

(ii) Which apparatus would she use to separate the colours in ink?
Give the correct letter.

.....

1 mark

(ii) Which apparatus would involve the use of a piece of equipment called a
condenser?
Give the correct letter.

.....

1 mark

Maximum 7 marks