

Sub Strand 2.2 MATERIALS

3.2.1 PURE SUBSTANCES, MIXTURES AND SOLUTIONS

1. **Pure substances** are elements or compounds that cannot be physically separated.

Examples: water, carbon monoxide, oxygen



EXPERIMENT: SOLUBLE AND INSOLUBLE SUBSTANCES

AIM

To investigate the difference between soluble and insoluble substances.

MATERIALS

- 6 test – tubes labeled A,B,C,D,E,F
- Test – rack
- Rubber stoppers
- Measuring cylinder
- A small quantity copper sulphate, salt, sugar, chalk, sand, stone

METHOD

1. Place 30ml of water in each test – tube and then to each test tube labeled A, B, C, D, E, and F add a small quantity of the substance listed in table 2.1 to it.
2. Place a rubber stopper in each of the test tubes in turn and shake the tube gently. (If you are reusing a stopper, rinse in water in between test tubes.
SAFETY: never put your finger or hand over a test tube to shake it since whatever is in the test tube may be poisonous or may burn you.
3. As you shake each tube, hold it up to the light. Is it cloudy, or does the light shine through it? Is the liquid coloured or colourless?

TABLE 2.1

TEST-TUBE	SUBSTANCE	OBSERVATION	SOLUBLE/INSOLUBLE
A	Copper sulphate		
B	Salt		
C	Sugar		
D	Chalk		
E	Sand		
F	stone		

4. Allow the test tubes to stand in the rack for five minutes. Have any of the substances settled to the bottom?

RESULTS

Record your results in a table like 2.1

CONCLUSION

1. Which of the substances you tested were soluble and formed a solution in water?
2. Which of the substances you tested were insoluble in water?

Example of insoluble liquid:

Oil + water = cannot mix but forms two layers (water and oil layer)



(Source:www.pinterest.com)

2. **Mixtures** are made up of two or more substances that are together in the same place but are not chemically combined. This means they can be separated physically.



Examples: soil, sugar and water.

3. One of the commonest types of mixture we deal with is called a solution. A solution has two parts: the solid which is dissolved is called the solute and the liquid that does the dissolving is called the solvent.

Example; solute + solvent = solution
Salt + water = salt solution

What other solutions you know of? What is the solute and what is the solvent in each solution you have named?

A solution that has become so full of solute that no more can dissolve is called a saturated solution. A dilute solution contains only a small amount of solute.

In your exercise book

1. Write the heading: **Pure substances, Mixtures and Solutions.**
2. Copy and complete

A solution is made when one substance known as the _____ is dissolved in another known as the _____.

In a cup of coffee, the coffee beans are the _____ and the water is _____.

3. Name some solutions you know.
4. A concentrated solution _____.
5. A dilute solution _____.