

Grade 7 Science

Unit 3: Mixtures and Solutions

Chapter 9: Many useful products depend on technology for separating mixtures and solutions.



Name: _____

Section #: _____

Separating Mixtures

Mixtures	Method of Separation	Explanation
1. Salt Water	distillation	The water will separate from the salt
2. Muddy Water	distillation/filtration	The water will separate from the mud
3. Nuts and Bolts	by hand	Nuts and bolts are different sizes and easy to separate
4. Iron filings and sand	magnet	The iron filings will be attracted to the magnet.
5. Vegetable oil and sand	add water, remove oil, filter water and sand	Oil separates from water and can be removed, filtration will remove sand from water
6. Vegetable oil and water	floatation	oil and water separate and the oil floats to the top and can be removed
7. Salt and pepper	floatation	Salt will sink in water and pepper will float.

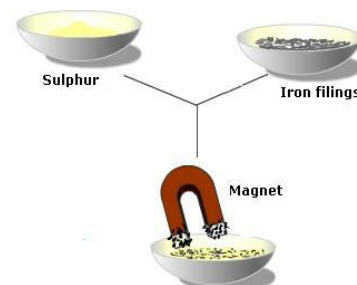
Are the components you have separated still mixtures or are they pure? Explain your answer.

Some are now pure substances, but some are not. For example, the water separated by filtration or distillation is now a pure substance, but the vegetable oil is not a pure substance.

Separation Techniques

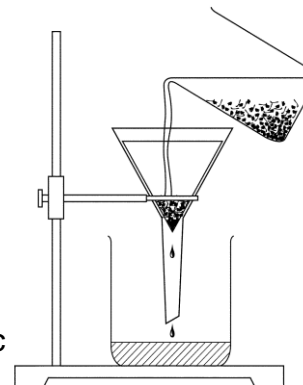
1. Mechanical Sorting

- Used to separate the parts of a mixture based on properties such as particle size.
- Examples: floatation and magnetism



2. Filtration

- A common way to separate solid particles from a mixture.
- Filters can have holes of varying sizes... small to microscopic
- Examples: coffee filter, oil filter, furnace filter, colander



3. Evaporation

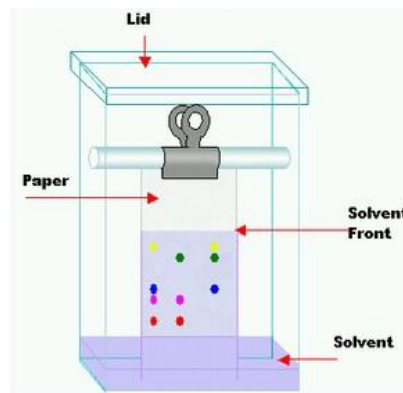
- Changes of state from a liquid to a gas
- Used to recover a solid solute from a solution

4. Distillation

- Uses two changes of state: evaporation and condensation
- It allows you to recover BOTH the solute and the solvent from a solution.

5. Paper Chromatography

- Used to separate the coloured substances in a mixture such as ink
- Used to separate the solvents in a mixture.

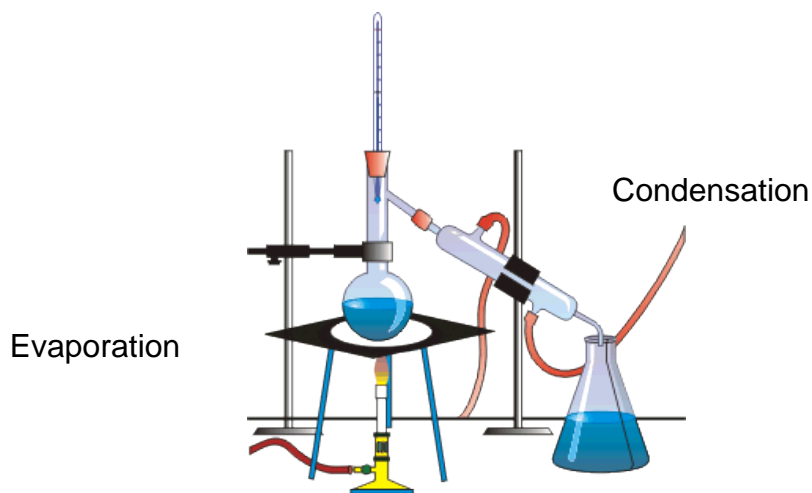


Separation Techniques in the Home (*With a partner list as many methods of separation that you use.*)

Colanders, clothes dryers, window screens, coffee percolators, salad spinners

Distillation

Label the diagram below of a distillation apparatus and explain what is happening.



The solution is heated so the solvent evaporates. Once it reaches the top of the flask it begins to cool and condense. The condensing solvent enters the tube and condenses into the flask on the side. Once all the solvent has evaporated/condensed the solute will be left in the original flask and the solvent will be in the flask on the right.

Two types of Distillation

Simple Distillation	Separates a single solute from its solvent.
Fractional Distillation	Separates a mixture of liquids based on their varying boiling points.