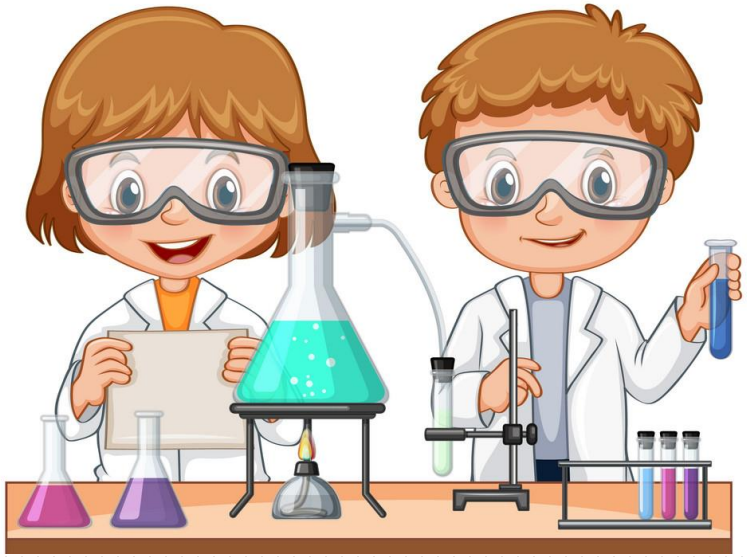
Chapter 10

Lesson-3. Mixture



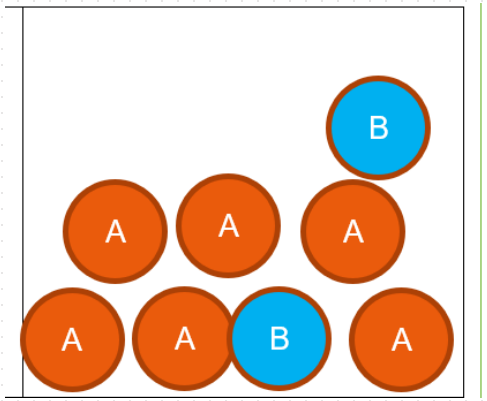
- A mixture of elements
- From elements to a compound
- Chemical reactions and reactions and equations
- Chemical names of compounds
- **Differents types of mixture**
- Separating mixtures

Match up the appearance formula and descriptions

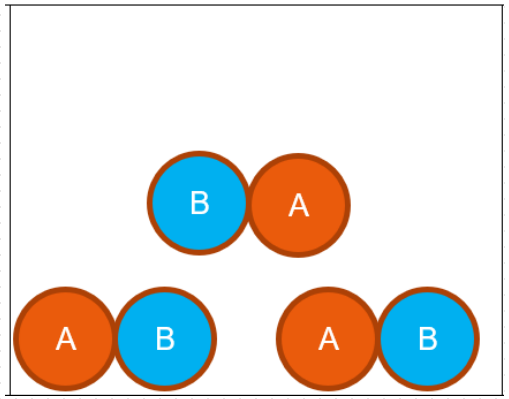
Apperance	Formula	Description
A colourless liquid that boils at 100 ºC	Formula: N_2	One atom of carbon joined to two atoms of oxygen
A colourless gas that turns limewater milky	Formula: O_2	Eight atoms of sulphur joined together in a ring
A poisonous gas that can dissolve in water making an acid	Formula: H_2O	Two atoms of oxygen joined together
The gas that makes up nearly 80% of the air	Formula: CO_2	One atom of sulphur joined to two atoms of oxygen
The gas that is used by animals and plants in aerobic respiration	Formula: S_8	Two atoms of hydrogen joined to one atom of oxygen
A yellow solid that is often found around volcanoes	Formula: SO_2	Two atoms of nitrogen joined together

Time= 12 mins

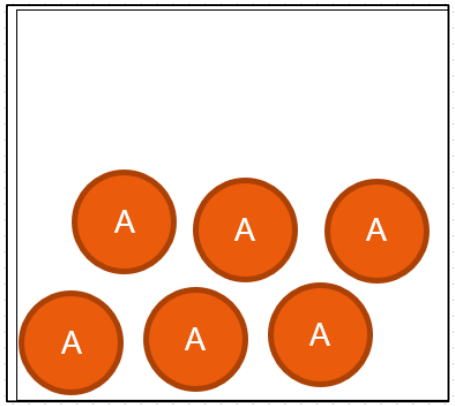
Quiz: which would be the element? Compound? Mixture?



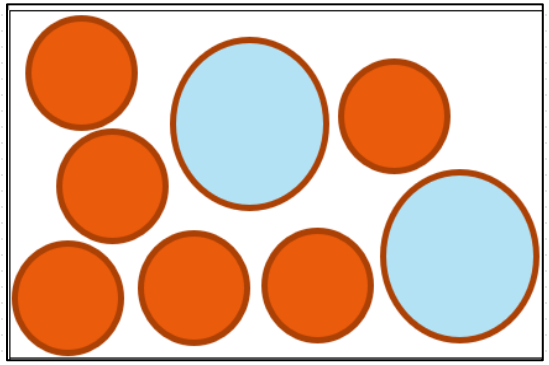
Mixture



Compound



Element



Mixture

Alloy

Mixtures

- A mixture is composed of two or more separate substances. The composition of a mixture may vary widely.
- One mixture of two substances. A and B, might have a large amount of A and a small amount B.
- Another mixture might have a small amount of A and a large amount of B.

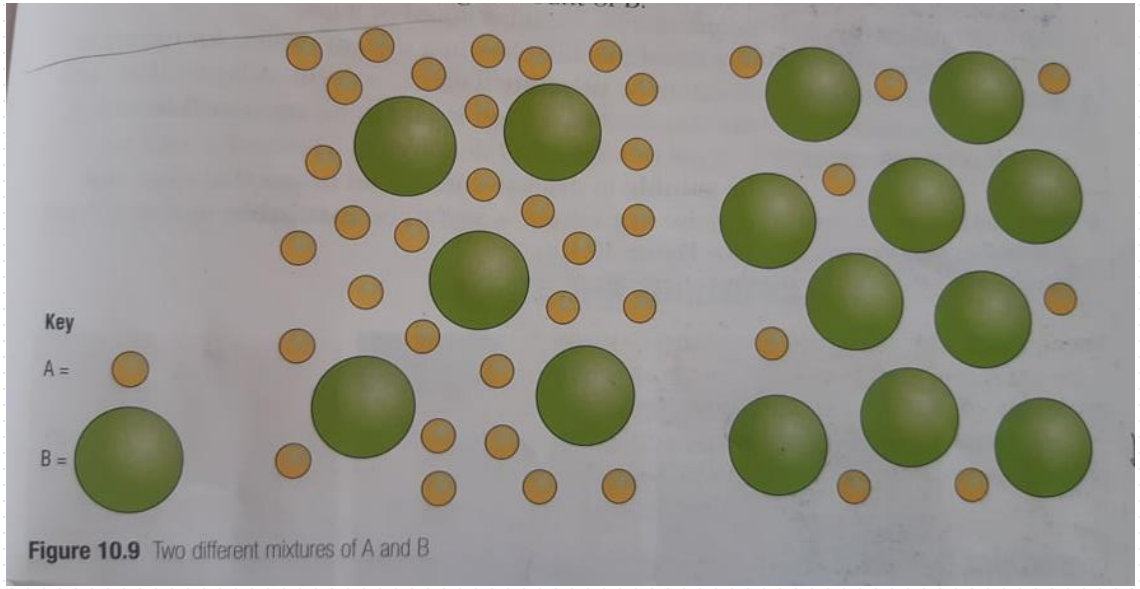


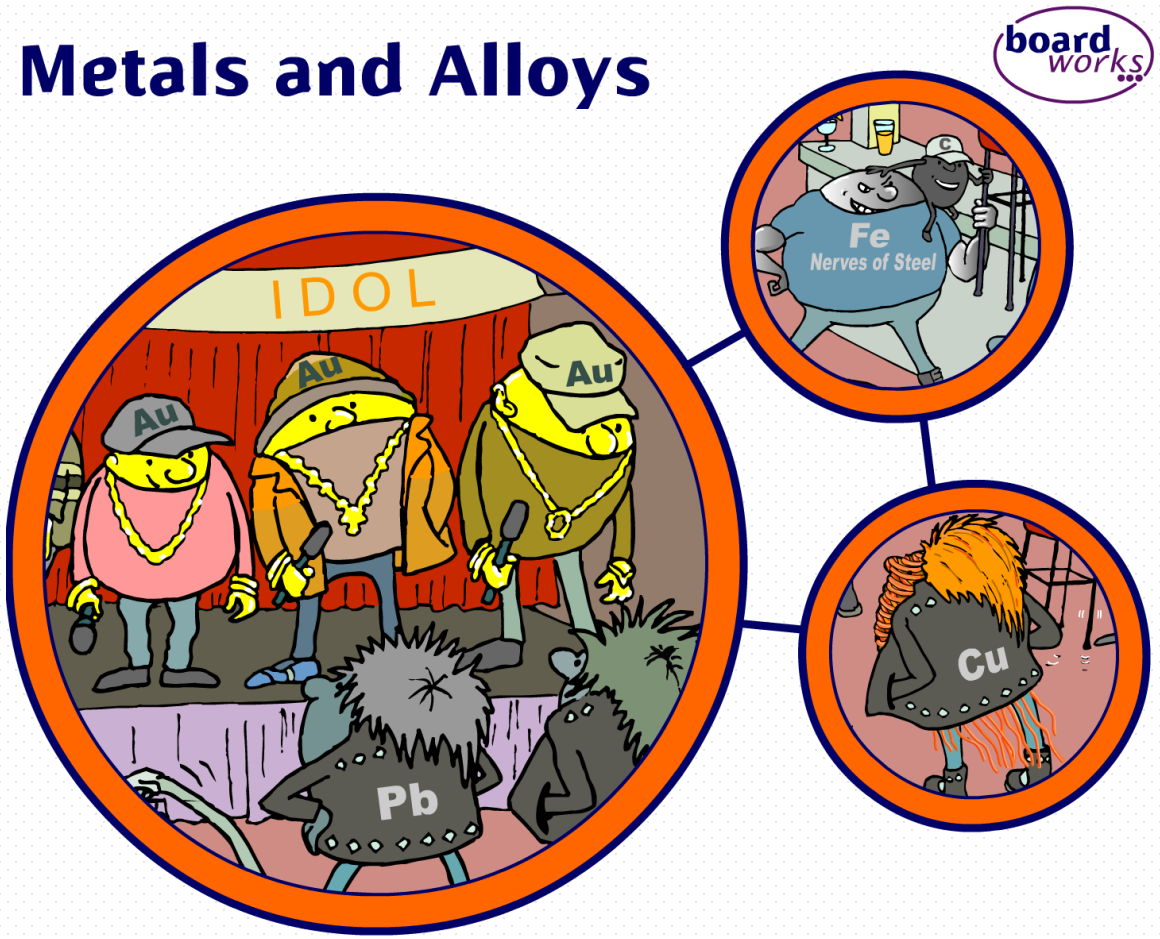
Figure 10.9 Two different mixtures of A and B

Different types of mixtures

/ table 10.2 Different types of mixtures with examples /

Type of mixture	Examples
solid mixed with a solid	• soil contains clay, silt and sand, **alloy**
solid mixed with a liquid	• clay and water-the clay particles are suspended in the water and make a mixture called a **suspension** • if the solid dissolves a solution is made (see 124)
solid mixed with a gas	• smoke
liqiud mixed with a liquid	• milk is a made from tiny dropets of oil in water. This type of mixtures is called an **emulsion** • some paints are also emulsions
gas mixed with a gas	• air contains nitrogen, oxygen, carbon dioxide and many other gases
liquid mixed with a gas	• mist is tiny droplets of water mixed with air • a suspension of liquid droplets in a gas is called an aerosol
gas mixed with a liquid	• bubbles of a gas trapped in a liquid form a foam • foams can be used for shaving products and for giving protection from the Sun

An **alloy** is a mixture of a metal with at least one other element.

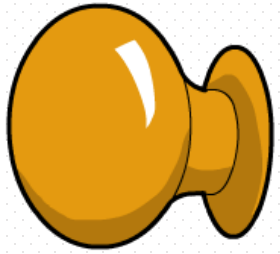


- The final alloy may have very different properties to the original metal.
- By changing the amount of each element in an alloy, material scientists can custom-make alloys to fit a given job.

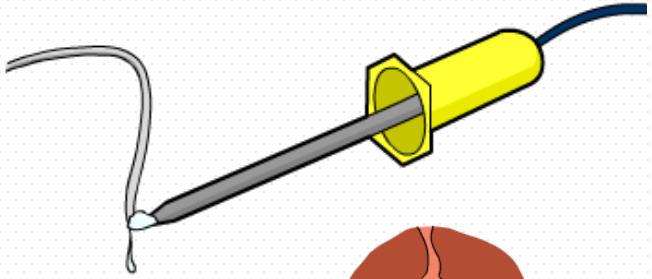
What types of alloys are there?

Alloys have been used for thousands of years. **Bronze**, an alloy of copper and tin, was commonly used by civilizations before iron extraction methods were developed.

Other well-known alloys include:



- **brass**: an alloy of copper and zinc.
  It does not tarnish and is used for door knobs, buttons and musical instruments.



- **solder**: an alloy of zinc and lead. It is used in electronics to attach components to circuit boards.

- **amalgam**: an alloy of mercury and silver or tin. It is used for dental fillings because it can be shaped when warm and resists corrosion.

Steel

- Steel is a common example of an alloy. It contains iron mixed with carbon and other elements.
- Steel can contain up to 2% carbon.
- Adding other elements to a metal changes its structure and so changes its properties.



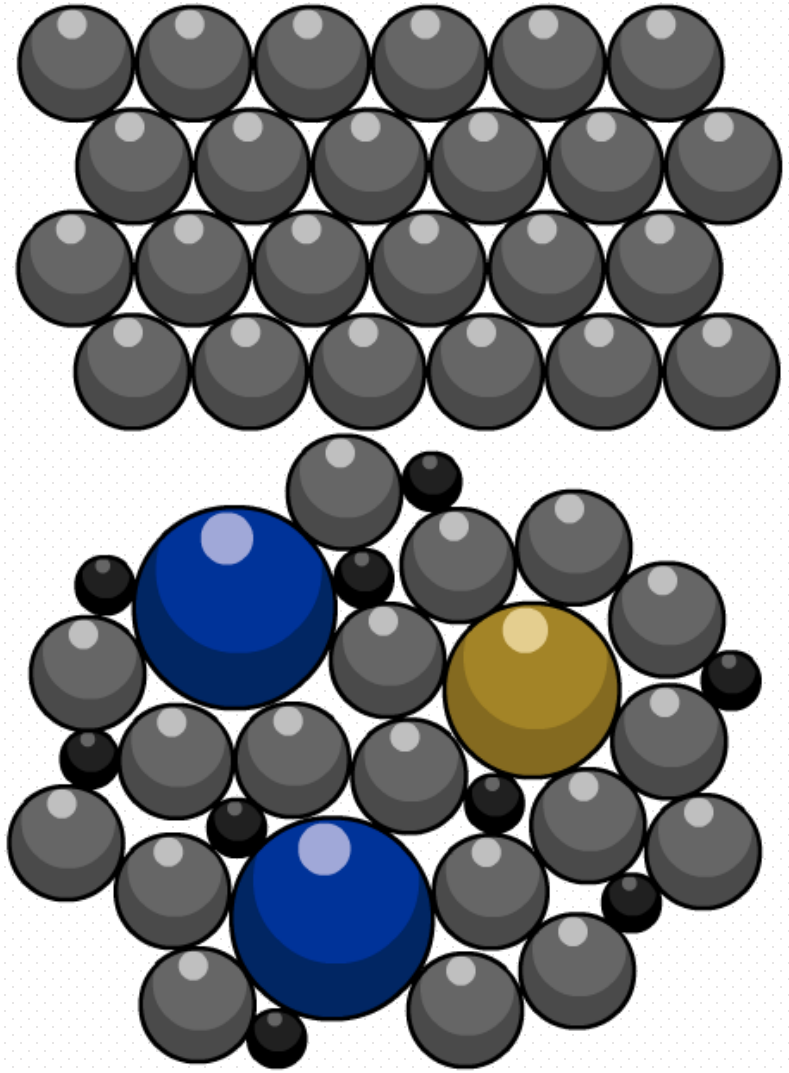


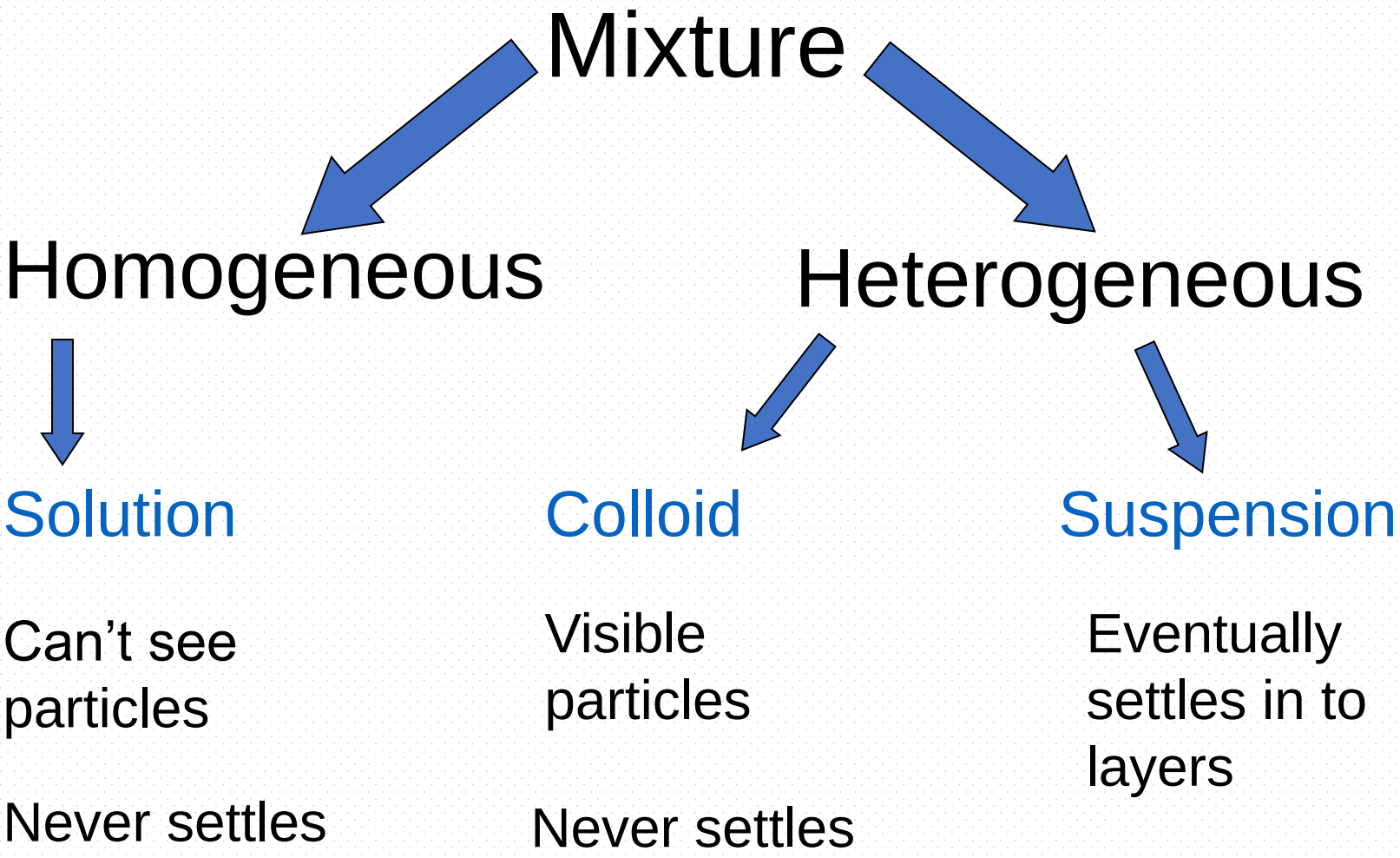
Why is steel stronger than iron?

- The atoms in pure iron are arranged in densely-packed layers. These layers can slide over each other. This makes pure iron a very soft material.

- The atoms of other elements are different sizes. When other elements are added to iron, their atoms distort the regular structure of the iron atoms.

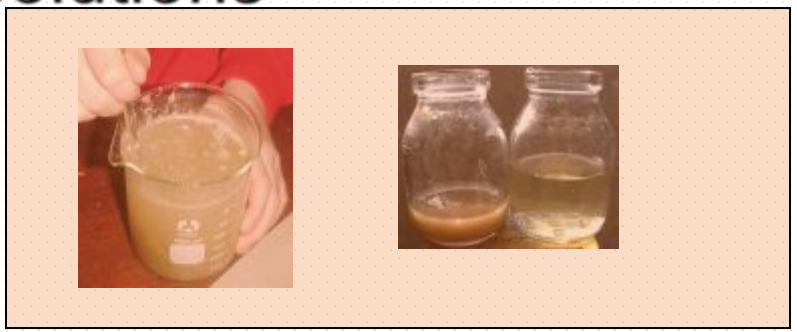
- It is more difficult for the layers of iron atoms in steel to slide over each other and so this alloy is stronger than pure iron.




Mixture
Homogeneous
Heterogeneous
Solution
Can’t see particles
Never settles
Colloid
Visible particles
Never settles
Suspension
Eventually settles in to layers

Mixtures

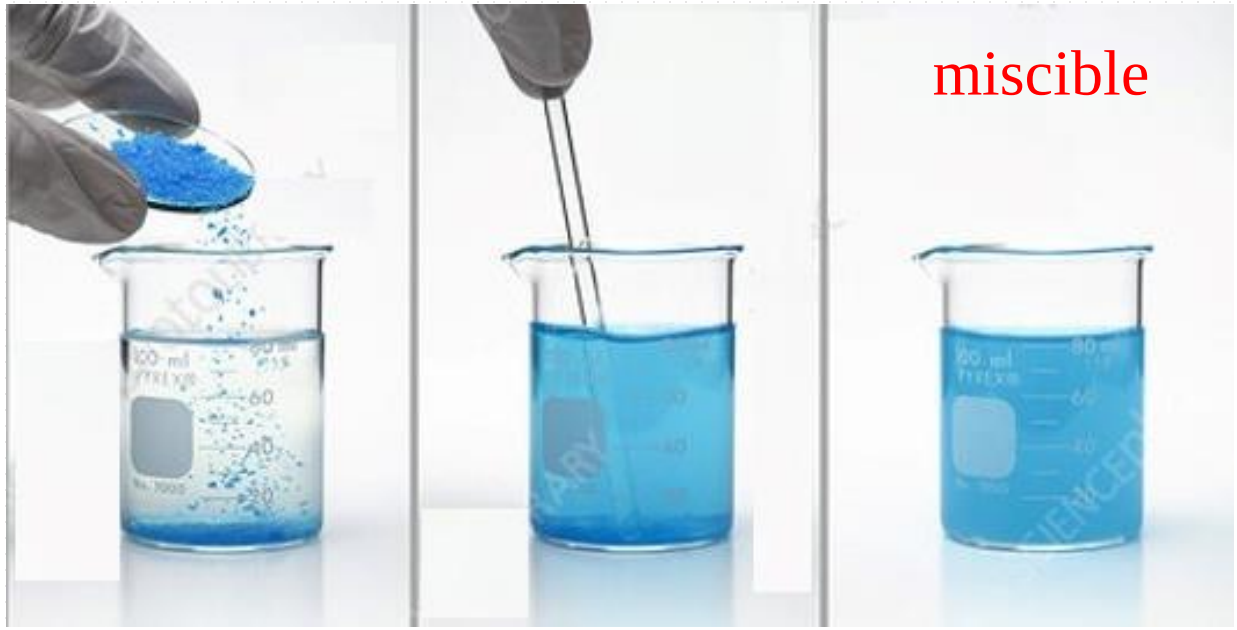
- Can be heterogeneous (see diff pieces) or homogeneous (uniform appearance)
- Homogeneous mixtures are called **solutions**



- Heterogeneous mixtures include **suspensions**

Soluble

soluble



miscible

Copper sulfate
$(CuSO_4 \cdot 5H_2O)$
solvent- уусан бодис

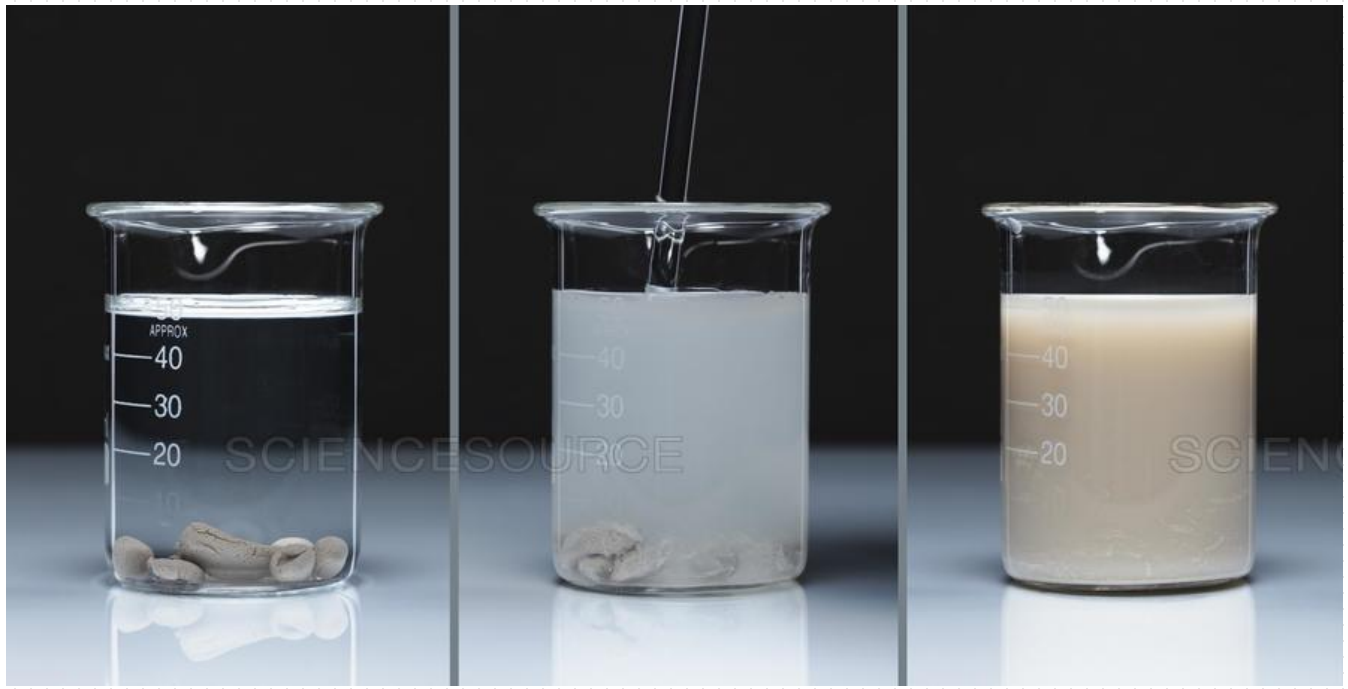
\+

Water
solvent- уусгагч

→

blue solution
solution- уусмал

Insoluble



Clay +water → *Suspension* → *Sediment*

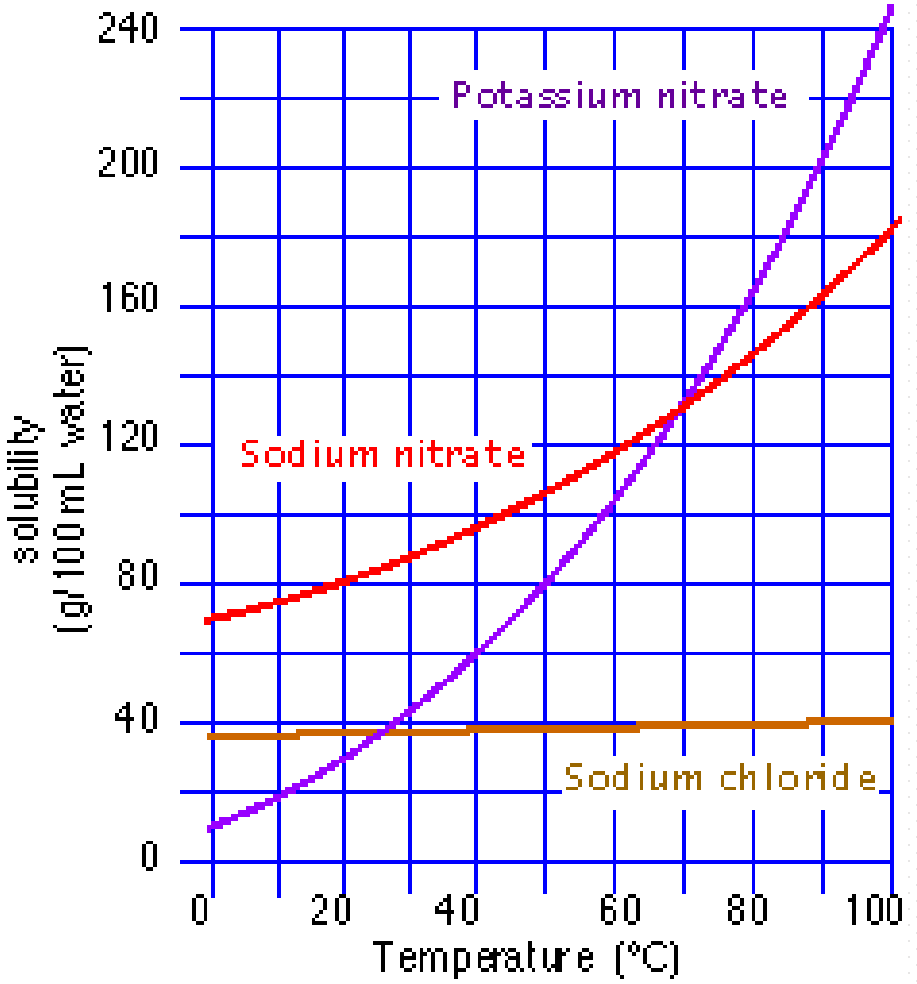
Solution

- A liquid that dissolves in a solvent, water, for example, is said to be miscible with the solvent. A liquid that does not dissolve in a solvent is said to be immiscible with it.
- A gas or a solid that dissolves in a solvent is said to be soluble in that solvent. A solid or gas that does not dissolve in a solvent is said to be insoluble in that solvent.

Solutions – look the same throughout

- From Chem4kids
- How much solute can dissolve in water?
- Solubility graph can tell you

1. Most compounds show a(n) _____ in solubility as temp. inc.
2. Which compound shows the greatest increase in solubility as temp inc?
3. Which compound(s) actually dec in solubility as temp inc.?
4. How much potassium nitrate will dissolve in 100 ml of water at 40°C?
5. How much sodium nitrate will dissolve in 100 ml of water at 90°C?



Different solvent

Different solvent

Homework

Сурагчийн номны 124 дүгээр хуудасны 4-9 дугаартай асуултанд хариулаарай.