

LESSON

17

What are the properties of solutions?

What happens when you add salt to a jar of water and stir? The salt disappears. You have made a solution. Does the same thing happen when you add sand to water? No. The sand settles to the bottom of the jar.

How can we tell if a mixture is a solution or not? We can tell by its **properties** [PROP-ur-tees]. Properties tell us how a kind of matter looks and acts.

These are the properties of solutions:

- (1) The parts dissolve and become the size of molecules.
- (2) Solutions are **homogeneous** [hoh-muh-JEE-nee-us].
- (3) Solutions are **transparent** [trans-PER-unt].
- (4) Solutions do not settle out.

MOLECULE SIZE You know that matter is made up of tiny atoms. Most matter is made up of groups of atoms called molecules. In a solution, the particles of solute dissolve. They break up until they are the size of molecules.

HOMOGENEOUS Homogeneous means evenly mixed—the same all through. Because the particles are the size of molecules they weigh very little. They move around and spread out evenly.

TRANSPARENT You can see clearly through something that is transparent. Glass is transparent. So are solutions. The molecules that make them up are tiny. They do not block out light. Light passes right through.

THE PARTS NEVER SETTLE OUT Something that settles out drops to the bottom of its container. The parts of a solution never separate. They never settle out no matter how long they sit. That is because the molecules are light. They keep bouncing around. This also keeps the solution homogeneous.

MORE ABOUT SOLUTIONS

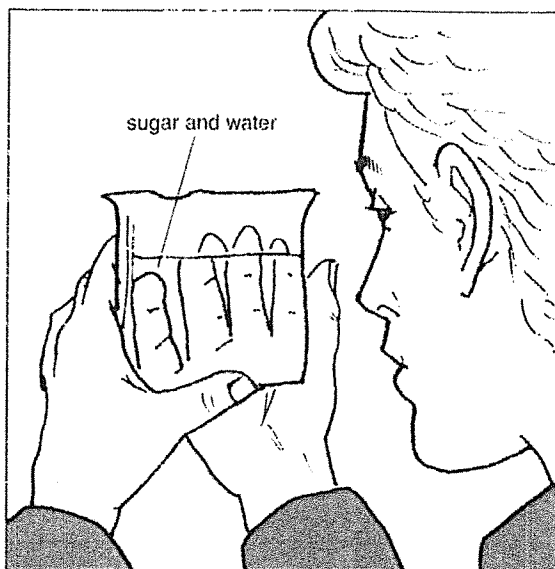


Figure A

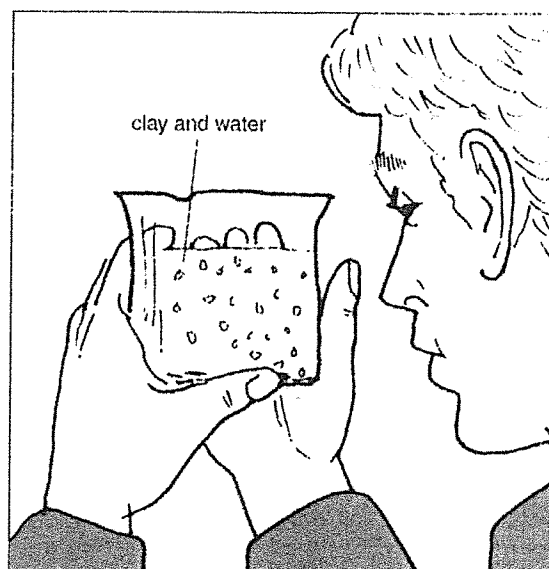


Figure B

Look at Figure A.

1. Can you see the sugar particles? _____
yes, no
2. The sugar _____ dissolve.
did, did not
3. The sugar is now _____
the size of molecules, much larger than the size of molecules
4. Can the boy see through the sugar water? _____
yes, no
5. The sugar water is _____
cloudy, transparent
6. The mixture _____ evenly mixed.
is, is not
7. It _____ homogeneous.
is, is not
8. The sugar _____ settling.
is, is not
9. Sugar water _____ a solution.
is, is not

Look at Figure B.

1. Can you see the clay particles? _____
yes, no
2. The clay _____ dissolve.
did, did not
3. The clay particles are _____
the size of molecules, much larger than the size of molecules

4. Can the boy see clearly through the mixture? _____
yes, no
5. The clay water is _____.
cloudy, transparent
6. The mixture _____ evenly mixed.
is, is not
7. It _____ homogeneous.
is, is not
8. The clay _____ settling out.
is, is not
9. Clay water _____ a solution.
is, is not

FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided. Some words may be used more than once.

solutions
drop
molecules

moving around
is not
transparent

light
clay water
small in size

1. When we can see clearly through something we say it is _____.
2. _____ are transparent.
3. _____ is not transparent.
4. Clay water _____ a solution.
5. The parts of a solution are the size of _____.
6. The molecules of a solution do not block _____.
7. To "settle out" means to _____.
8. The parts of _____ do not settle out.
9. Solutions do not settle out because the parts are too
_____.
10. The molecules in liquid solutions are always _____.

WHICH IS HOMOGENEOUS?

The dots stand for copper sulfate molecules. The liquid is water.

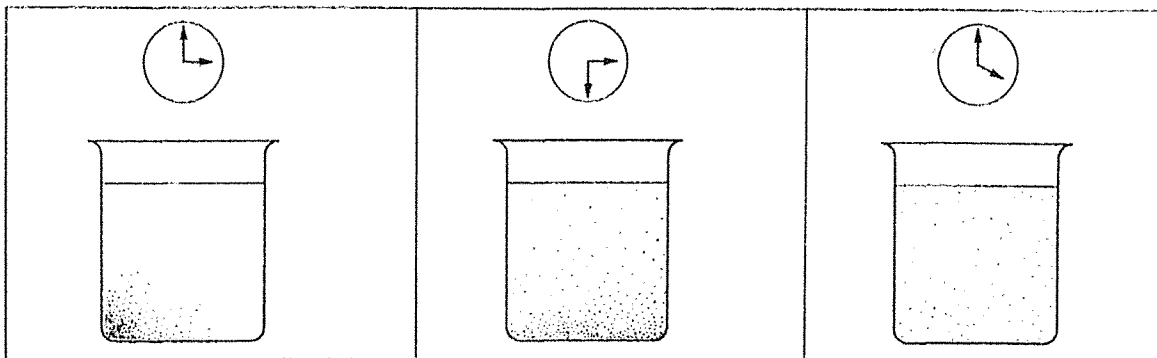


Figure C

Figure D

Figure E

- Which figure shows a homogeneous mixture? _____
- The mixtures in Figures _____ and _____ are not solutions.
 - They are not liquid solutions because they _____ homogeneous.
are, are not
- The mixtures that are not solutions _____ become solutions.
could, could not
 - They would be solutions if all the _____ dissolved, and spread out evenly.
solute, solvent
- Think about this: What would you do to make the mixtures that are not homogeneous, become homogeneous fast?

MATCHING

Match each term in Column A with its description in Column B. Write the correct letter in the space provided.

Column A	Column B
_____ 1. molecule	a) evenly mixed
_____ 2. homogeneous	b) drop
_____ 3. settle out	c) tiny part of matter
_____ 4. properties	d) clear
_____ 5. transparent	e) things that help us identify matter