WATER: WEIRD AND WONDERFUL

SAMPLE

STUDENT WORKBOOK

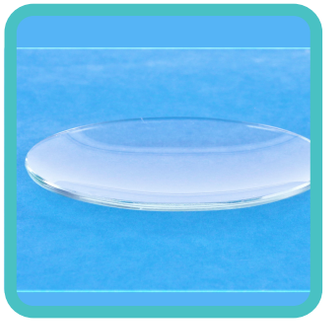
ACCELERATE

EXPERIMENT 3:

3

PREDICT:

How many pipets of water will it take to dissolve all the salt in the salt packet?



STEP 1

Place the watch glass on a flat surface, with the edges curving upward.

STEP 2

Find the water cup and the pipet.

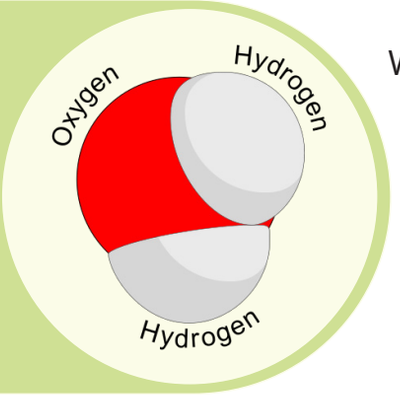
STEP 3

Fill the pipet using the technique from Experiment 1.

STEP 4

Open the salt packet and pour the salt into the middle of the watch glass.

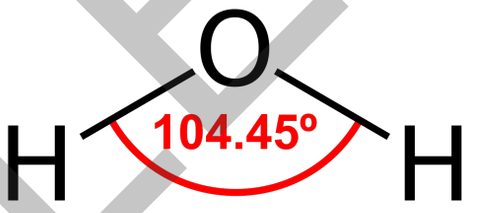
SAMPLE



Water is a compound. It has only one type of molecule, which is made of two hydrogen atoms and one oxygen atom. The shape of a water molecule is not a straight line; it's bent at an angle. Keep reading to find out why, and how it affects the properties of water.

8 WATER'S POLAR STRUCTURE

Take a closer look at water's molecular structure. The oxygen atom is bent away from the two hydrogen atoms. In fact, every water molecule has the exact same shape, down to the number of degrees of the angle. Water takes on a bent shape because of the forces of attraction and repulsion within the molecule. You might have heard the saying, "opposites attract." That's true when it comes to atoms.

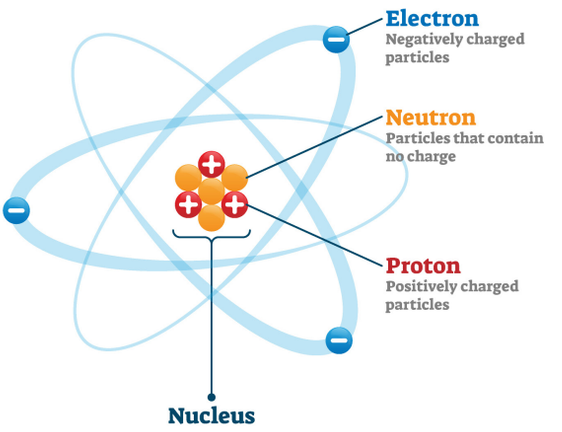


Structure of Atoms

Atoms are made of three types of smaller parts, called **subatomic particles.** These three types of subatomic particles are protons, neutrons, and electrons. Different types of atoms have different numbers of these subatomic particles.

Protons are positively charged, and they're found in the nucleus, or center, of an atom. Protons determine the identity of the atom. For example, every atom of the element carbon has six protons, while every atom of the element gold has 79.

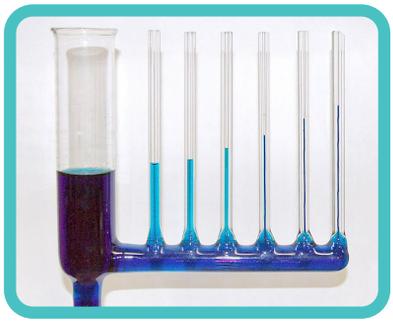
Neutrons are also found in the nucleus, but they don't have a positive or negative charge (they're *neutral*). They help determine an atom's stability and radioactivity; more stable atoms usually have about the same number of protons as neutrons (with some exceptions). Atoms of the same element can have different numbers of neutrons.



The protons and neutrons make up the nucleus, and the electrons move around the nucleus.

SAMPLE

The thinner the tube, the higher water will climb. The reason is that there is more glass compared to water molecules at the surface of the water, so the attraction between them is greater. In a wider container, the attraction from the glass or other surface can't reach the molecules in the middle.



THINK ABOUT IT!

? **Explain why the saying "opposites attract" is important in science, using at least two examples.**

SAMPLE

Capillary Comparison

Water's climbing ability is affected by many factors, like how wide and tall the container is, how much water is in the container, and what the surface it's climbing is like. In this experiment, you will compare water adhesion in a capillary tube and in filter paper. A capillary can be any narrow tube, but in chemistry, a capillary tube is a short, thin glass tube.

WHAT YOU NEED:

FROM THE KIT:

- ■ Capillary tube
- ■ Clear plastic cup
- ■ Filter paper
- ■ Food coloring
- ■ Wooden splint

OTHER ITEMS:

- ■ Water

WHAT TO DO:

STEP 1

Fill the plastic cup with water, about halfway.

1. Imagine that you are trying to identify a mystery substance.
Here's what you know:
- It's a clear liquid.
- You measured a sample of it and it had a mass of 15.5 g and a volume of 19 mL.
- It dissolves in water with a little bit of stirring.

Which of these substances is most likely the mystery substance? Support your choice with evidence and explain how you used that evidence to decide.
- Benzene: nonpolar, density 0.9 g/mL
- Ammonia: very polar, density 0.8 g/mL
- Kerosene: nonpolar, density 0.8 g/mL
- Pentanol: slightly polar, density 0.8 g/mL
- Diethyl ether: slightly polar, density 0.7 g/mL

SAMPLE

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SAMPLE

Kit	SU-WTRWRD
Instructions	IN-WTRWRDS
Revision Date	4/2021