

Chemical Reactions



Lavoisier

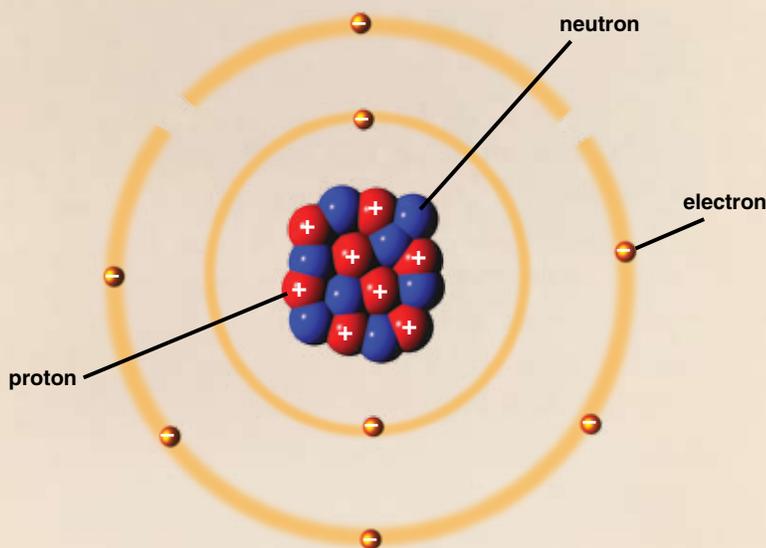
Antoine Lavoisier (ahn-TWAN la-vwah-ZYAY) was a man who studied science a long time ago. He did important work. Now we say that he is the “Father of Modern Chemistry.” He changed science for all time.

The Element Oxygen

Lavoisier was the first person to name oxygen. He called it an element. He said an element is a thing that does not break into things that are more simple. But it can be a part of other things. Oxygen is a part of other things. It is a part of air. It is in water, too.

All things are made of atoms. Atoms are small bits of matter. There are many kinds of atoms. An element is made of atoms that are the same.

Atoms are made of three parts. One part is protons. One part is neutrons. One part is electrons. Atoms of an element have the same parts. They are mixed the same way. Parts mixed in other ways make other kinds of atoms. Other kinds of atoms make other elements. Lavoisier named 34 elements.



Oxygen atom

Law of Conservation of Mass

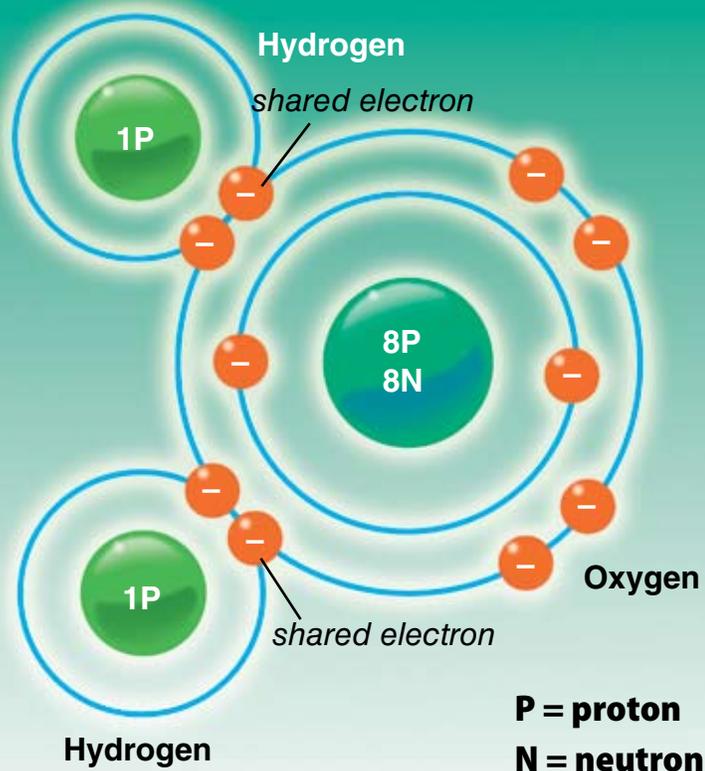
Two substances can have a chemical reaction. That means they react with each other. They change. They become a new substance. Oxygen and iron are two substances. They can react with each other. They change when they react. They become rust.

Lavoisier wanted to know what happens. He made a plan. He measured the mass of each substance first. Mass is the amount of matter in the substance. Next, he let the substances react with each other. They made a new substance. He measured the mass of the new substance. The mass before was the same as the mass after!

Oxidation

Lavoisier learned one more thing about oxygen. It reacts with many things. But it often reacts in the same way. It rusts iron. It makes copper go dull. It turns some metals gray. There is one reason for this. That reason is oxidation (OX-id-ay-shun). Lavoisier knew this was so. But he did not live to find out more.

We know more now. We know that oxygen atoms have a “hole.” Electrons are on the outside of the atom. That is where the hole is. The hole sucks in electrons from other atoms. This lets the oxygen atom drag the other atoms. When the atoms get stuck together, they make new compounds. Rust is one of these compounds.



Comprehension Question

What is a chemical reaction?

Chemical Reactions



Lavoisier

Antoine Lavoisier (ahn-TWAN la-vwah-ZYAY) was a scientist who lived a long time ago. He is known as the “Founder of Modern Chemistry.” His work changed the study of science for all time.

The Element Oxygen

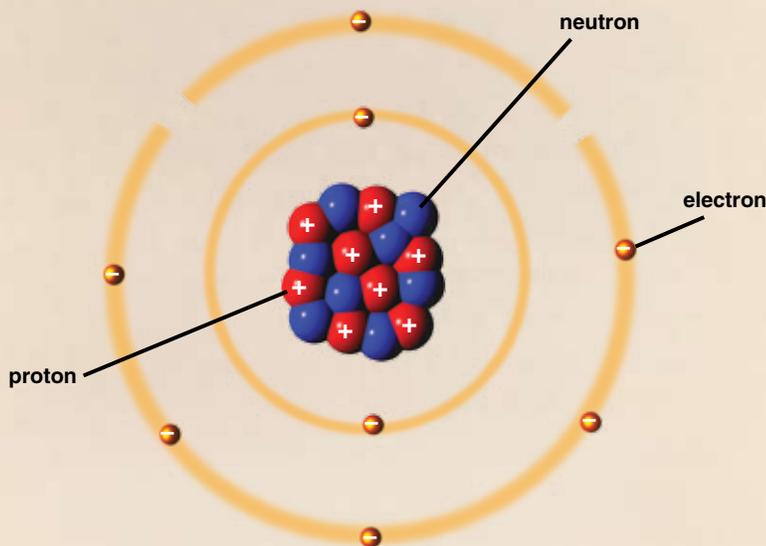
Lavoisier was the first scientist to name oxygen. He said it was an element. An element is a thing that can not break into simpler things. Oxygen is important. It is in our air. It is part of water, too.

We know more about elements now. We know that all things are made of atoms. Atoms are small bits of matter.

There are different kinds of atoms. An element is made of atoms that are the same.

All atoms are made of three parts. One part is protons. One part is neutrons. The third part is electrons. The atoms in an element are made of the same mix of these parts. A different mix makes different kinds of atoms. Different kinds of atoms make different elements.

There are over 100 kinds of elements. Lavoisier named 34 of them.



Oxygen atom

Law of Conservation of Mass

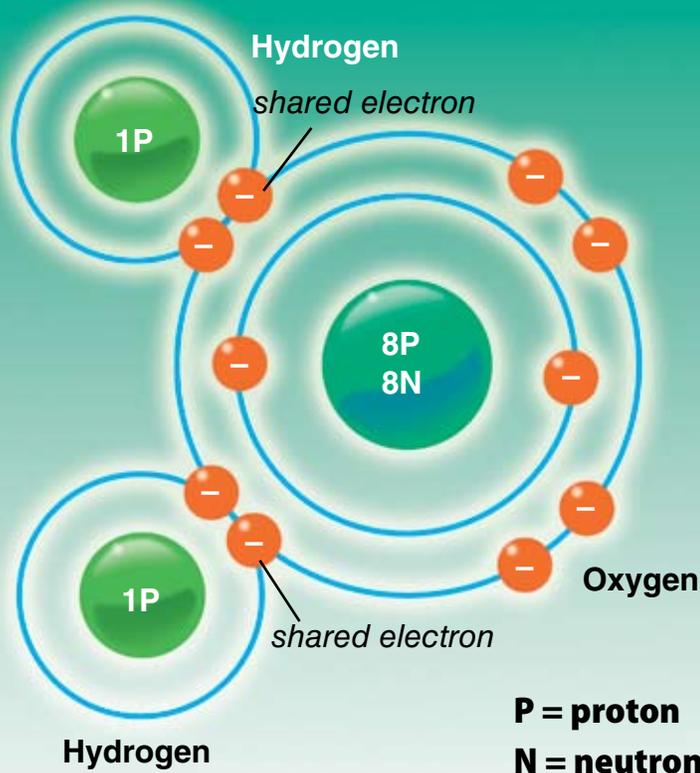
Lavoisier worked on chemical reactions. A chemical reaction happens between substances. They react with each other. They become a new substance. Oxygen and iron react with each other. They become rust.

First, Lavoisier measured the mass of each substance. Mass is the amount of matter a substance has. Then, he let the substances react. He measured the mass of the new substance. The masses were the same! He saw that matter is never lost or gained. The total mass stays the same when something new is made. He called this law Conservation (kon-ser-VAY-shuhn) of Mass. To conserve means to keep it the same. Matter can change. But its mass stays the same.

Oxidation

Lavoisier learned one more thing about oxygen. It reacts with many things. It often reacts in the same way. Oxygen rusts iron. It dulls copper. It turns some metals gray. Why does it do this? Lavoisier said it is because of oxidation (OX-id-ay-shun). Sadly, he died before he found out what it is.

Now we know that oxygen atoms have a “hole.” The hole is in the electrons on the outside of the atom. The hole sucks in electrons from other atoms. Then the oxygen drags the other atoms. When the atoms are stuck together, they make new compounds. Rust is one of these compounds.



Comprehension Question

What happens in a chemical reaction?

Chemical Reactions



Lavoisier

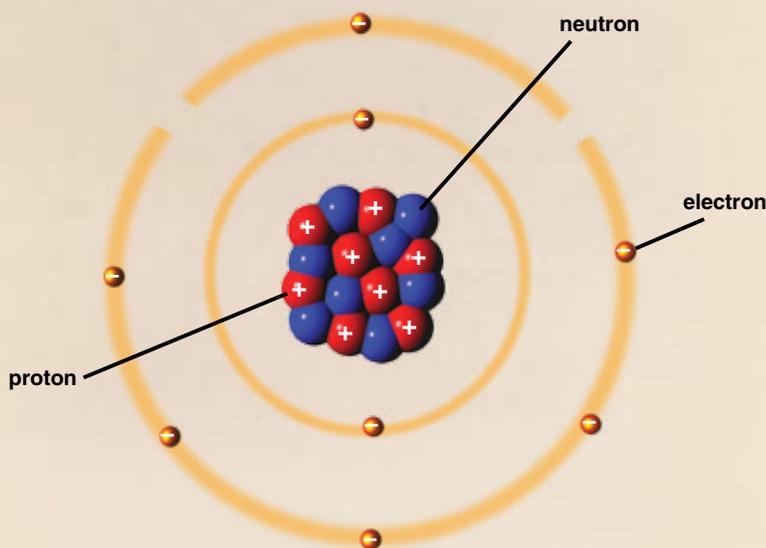
Antoine Lavoisier (ahn-TWAN la-vwah-ZYAY) is called the “Founder of Modern Chemistry.” He did important work as a scientist. He changed chemistry forever.

The Element Oxygen

Lavoisier was the first to name oxygen. He said it was an element. He defined an element as a thing that could not break down into simpler things. Oxygen is an important element. It is in the air we breathe. It is a part of water, too.

Scientists today have learned more about elements. They know that everything is made of atoms. Atoms are very small pieces of matter. There are many different kinds of atoms. An element is made of the same kind of atoms. All the atoms of an element are made of the same mix of three particles. The particles are protons, neutrons, and electrons. The different mix of particles makes different kinds of atoms. Different kinds of atoms make different elements.

Lavoisier also named 33 other elements! There are over 100 different elements in all. Many were not known until recently.



Oxygen atom

Law of Conservation of Mass

Lavoisier worked on chemical reactions. A chemical reaction happens when substances react. They turn into a new substance. When oxygen gas and iron metal come together, they react. They become rust.

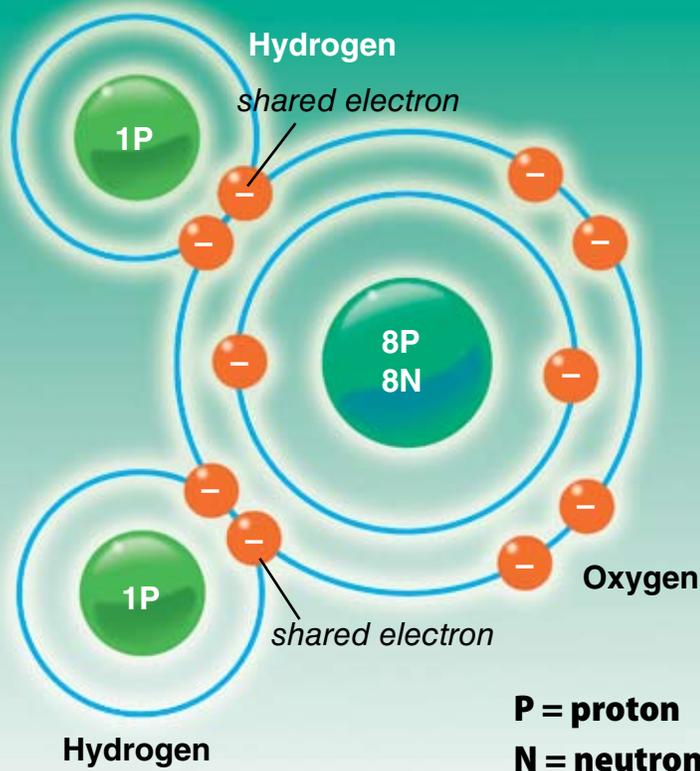
Lavoisier measured the mass of each substance before it reacted. Mass is the amount of matter a substance has. Then, he measured the mass of the new substance after the reaction. The masses were the same! He proved that matter is never lost or gained.

The total mass stays the same even when something new is made. He called this law Conservation (kon-ser-VAY-shuhn) of Mass. To conserve is to keep the same. Matter can change, but its mass stays the same.

Oxidation

Lavoisier found that oxygen reacts with many things. It often reacts in the same way. Oxygen rusts iron. It tarnishes copper. It turns other metals gray. Why? Lavoisier called this oxidation (OX-id-ay-shun). Sadly, he died before he found out what it really was.

Scientists now know that oxygen atoms have a “hole.” The hole is in the electrons on the outside of the atom. These holes suck in electrons from other atoms. Then the oxygen drags the other atoms. The atoms are stuck together. This makes new compounds. The rust that Lavoisier saw was one of these compounds.



Comprehension Question

How is oxidation a chemical reaction?

Chemical Reactions



Lavoisier

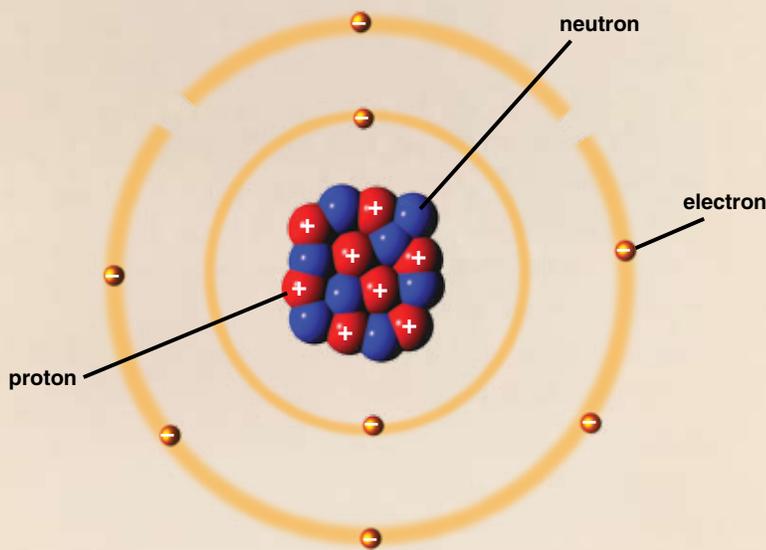
Antoine Laurent Lavoisier (ahn-TWAN loh-RAHN la-vwah-ZYAY) is considered the “Founder of Modern Chemistry.” During his life as a scientist, Lavoisier did some important new work. The work and how he did it changed chemistry forever.

The Element Oxygen

Lavoisier was the first to identify and name oxygen as an element. He defined an element as a substance that could not break down into a simpler substance. That definition remains today. Oxygen is one important element. It is in the air we breathe, and water is made partly of oxygen, as well.

Modern scientists also know that an element is made up of the same kind of atoms. That means that each little part of the element is made of the same mix of three particles. The atoms are made of protons, neutrons, and electrons. The different mix of particles makes different kinds of atoms. Different kinds of atoms make different elements.

Lavoisier named 33 other substances as elements, too! There are over 100 different elements in the universe, and many of them were not known until recently.



Oxygen atom

Law of Conservation of Mass

Lavoisier worked on chemical reactions. A chemical reaction happens when one or more substances react and turn into a new substance. For example, when oxygen gas and iron metal come together, there is a reaction. They become rust.

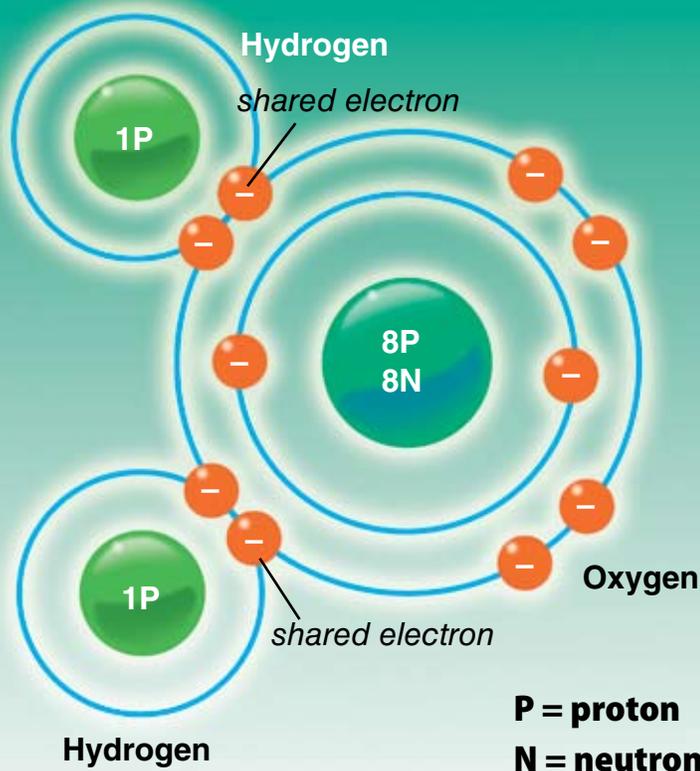
Lavoisier measured the mass of each substance before it reacted. Mass is the amount of matter a substance has. Then, he measured the mass of the new substance after the reaction. The masses were the same! He proved that matter is never lost or gained.

Even when something new is made, the total mass stays the same. He called this law Conservation of Mass. To be conserved is to remain the same. Matter can change, but its mass always stays the same.

Oxidation

Lavoisier also discovered that oxygen reacts with a number of other elements in the same way. Oxygen rusts iron, tarnishes copper, and turns other metals gray. What was happening? Lavoisier called the reaction oxidation (OX-id-ay-shun). Sadly, he died in the French Revolution before he found out what it really was.

Modern scientists know that oxygen atoms have a “hole” in the electrons on the outside of the atom. These holes suck in electrons from other atoms. Then the oxygen drags the other atoms along for the ride. The atoms are stuck together. This creates new compounds. The rust that Lavoisier studied was one of these compounds.



Comprehension Question

Describe how oxidation follows the Law of Conservation of Mass.