

KITCHEN CHEMISTRY



Do You Know?

Some bread is made with baking powder instead of yeast. Adding water to baking powder creates carbon dioxide bubbles.

Chemical changes can make some things delicious!

BUBBLING BREAD

What's that wonderful smell coming from the kitchen? It's freshly baked bread!

To make bread, bakers start by stirring yeast into warm water. Yeast is a microscopic, one-celled organism. Yeast uses sugar for energy. Bakers add sugar to the water to "feed" the yeast.

When the sugar is added, the yeast cells begin to split in two. The mixture gets foamy. The foam is caused by a *chemical change*. The yeast breaks down the sugar to create a new product called *carbon dioxide*. The carbon dioxide gas makes tiny bubbles in the yeast mixture.

Next, bakers combine the wet yeast mixture with dry flour to make dough. When the dough is left in a warm place, the bubbles in yeast get bigger and make the dough rise. Then the bread is baked in an oven. No new atoms are created during baking, and none are destroyed. Baking just rearranges the atoms in the ingredients to form tasty bread.



If the water is the correct temperature, the yeast will begin to bubble when sugar is added.

GREEN EGGS? HOLD THE HAM!

Have you ever opened a hard-boiled egg and noticed that the yolk was green around the edge? The color is a result of a chemical change that can't be undone.

When you add energy to an egg by boiling it, iron in the egg yolk combines with sulfur in the egg white. Together, these elements form a chemical that makes the yolk look green. The chemical change also creates a tiny bit of gas. The gas smells like rotten eggs. *Yuck!*

Science in Your World

To make hard-boiled eggs without green yolks, quickly put the cooked eggs into cold water. This step will stop the cooking and prevent the iron and sulfur from mixing.

Even though the yolk of a hard-boiled egg may look green, it's safe to eat.

WHAT'S IN YOUR WATER?

Is your water at home hard or soft? "Hard water" is full of minerals, such as calcium and magnesium. Your body needs both, but too many minerals can clog the pipes in your house. Hard water also leaves spots on glasses and makes it harder for soap to do its job.

You can "soften" hard water with a chemical change. When you add lime and soda ash to water, those chemicals combine with the minerals. They create a new solid. This solid is caught by a filter and taken out of the water.

The inside of this pipe shows a white substance called *scale*. Scale can clog pipes.



Water Hardness in the United States

