

Examples of Physical Changes and Chemical Changes

What Are Some Physical and Chemical Changes?

By **Anne Marie Helmenstine, Ph.D.**

Updated May 10, 2019

Are you confused about the difference between chemical changes and physical changes and how to tell them apart? In a nutshell, a **chemical change** produces a new substance, while a **physical change** does not. A material may change shapes or forms while undergoing a physical change, but no chemical reactions occur and no new compounds are produced.

Key Takeaways: Chemical and Physical Change Examples

A chemical change results from a chemical reaction, while a physical change is when matter changes forms but not chemical identity.

Examples of chemical changes are burning, cooking, rusting, and rotting.

Examples of physical changes are boiling, melting, freezing, and shredding.

Often, physical changes can be undone, if energy is input. The only way to reverse a chemical change is via another chemical reaction.

Examples of Chemical Changes

A new compound (product) results from a chemical change as the atoms rearrange themselves to form new chemical bonds.

Burning wood

Souring milk

Mixing acid and base

Digesting food

Cooking an egg

Heating sugar to form caramel

Baking a cake

Rusting of iron

Examples of Physical Changes

No new chemical species forms in a physical change. Changing the state of a pure substance between solid, liquid, and gas phases of matter are all physical changes since the identity of the matter does not change.

Crumpling a sheet of aluminum foil

Melting an ice cube

Casting silver in a mold

Breaking a bottle

Boiling water

Evaporating alcohol

Shredding paper

Sublimation of dry ice into carbon dioxide vapor

How to Tell Whether It's a Physical or Chemical Change?

Look for an indication that a chemical change occurred. Chemical reactions release or absorb heat or other energy or may produce a gas, odor, color or sound. If you don't see any of these indications, a physical change likely occurred. Be aware a physical change may produce a dramatic change in the appearance of a substance. This doesn't mean a chemical reaction occurred.

In some cases, it may be hard to tell whether a chemical or physical change occurred. For example, when you dissolve sugar in water, a physical change occurs. The form of the sugar changes, but it remains the same chemically (sucrose molecules). However, when you dissolve the salt in water the salt dissociates into its ions (from NaCl into Na⁺ and Cl⁻) so a chemical change occurs. In both cases, a white solid dissolves into a clear liquid and in both cases, you can recover the starting material by removing the water, yet the processes are not the same.

Learn More

[10 Examples of Physical Changes](#)

[10 Examples of Chemical Changes](#)

[Chemical and Physical Properties](#)

[Understanding Chemical and Physical Changes](#)

Source

Zumdahl, Steven S. and Zumdahl, Susan A. (2000). *Chemistry* (5th Ed.). Houghton Mifflin. ISBN 0-395-98583-8.