


So, you think you want to be a chemist, you might read this first ...

If you're looking for a stronger cleaner, be wary of **mixing your own**.

Arizona doctors reported in the New England Journal of Medicine on the case of a 53-year-old worker who nearly died when she mixed bleach with an over-the-counter liquid cleaner and inhaled the fumes while wiping down a walk-in freezer.

The woman's throat was so swollen that doctors were forced to perform an emergency tracheotomy; and the woman remained in the hospital for seven days.

Mixing common household cleaning products can cause serious injuries. This fact sheet describes some of the hazards of mixing chlorine bleach and other common cleaning products, and a few of the possible health effects. Be sure to always read the product labels before using household or institutional cleaning products.

- **Do not mix bleach and ammonia.**
- **Do not mix bleach and acids.**
- **Do not use two drain cleaners together, or one right after the other.**

What is chlorine bleach, and where is it found in the home?
Sodium hypochlorite is the active ingredient in chlorine bleach. It is found in household bleach and many other disinfectants. Sodium hypochlorite reacts with ammonia, drain cleaners, and other acids. Many household products state that they contain bleach on the label.




Where are ammonia and acids found in the home?

Ammonia:
In addition to ammonia purchased as a cleaning product, ammonia may be found in the following:

- some glass and window cleaners
- urine (be careful if you clean cat litter boxes or use a diaper pail)
- some interior and exterior paints.

Acids:
Products containing acids include:

- vinegar
- some glass and window cleaners
- some automatic dishwasher detergents and rinses
- some toilet bowl cleaners
- some drain cleaners
- some lime, calcium and rust removal products
- some brick and concrete cleaners

What are the dangers of mixing these common cleaning products?

Mixing bleach and ammonia:
When bleach is mixed with ammonia, toxic gases called chloramines are produced. Exposure to chloramine gases can cause:

- coughing
- shortness of breath
- chest pain
- wheezing
- nausea
- watery eyes
- irritation to the throat, nose and eyes
- pneumonia and fluid in the lungs

Mixing bleach and acids:

When chlorine bleach is mixed with an acid, chlorine gas is given off. Chlorine gas and water combine to make hydrochloric and hypochlorous acids.

Chlorine gas exposure, even at low levels, almost always irritates the mucous membranes (eyes, throat, and nose), and causes coughing and breathing problems, burning and watery eyes, and a runny nose. Higher levels of exposure can cause chest pain, more severe breathing difficulties, vomiting, pneumonia, and fluid in the lungs. Very high levels can cause death.

Chlorine can be absorbed through the skin, resulting in pain, inflammation, swelling, and blistering. Hydrochloric acid also causes burns to the skin, eyes, nose, throat, mouth and lungs.Mixing bleach and other cleaning products:
Bleach also reacts with some oven cleaners, hydrogen peroxide, and some insecticides.