Chlorine gas from household cleaners? [1]

Dear Alice,

I have been reading on the internet that mixing certain household cleaners can be deadly because doing so may release chlorine gas. When I am cleaning the house, how can I tell if I may have been accidentally exposed to chlorine gas, and whether or not I require medical evaluation?

— Mr. Clean

Answer

Dear Mr. Clean,

Cleaning with chemicals can certainly be a cause for concern! Chlorine is a toxic, yellow-green gas that’s one of today’s most heavily used chemical agents. Many household cleaners contain chlorine, including automatic dishwashing detergents, some laundry detergents, chlorine bleach, chlorinated disinfectant cleaners, mildew removers, and toilet bowl cleaners. As for mixing products, more isn't always better — unless a chemist is the one mixing, it’s recommended that household cleaners aren’t combined. Depending on the mixture, chlorine may be released, which can lead to poisoing and may even be fatal. If, while cleaning, someone inhales or ingests chlorine or starts to experience physical symptoms, stopping use of that particular product and seeking care from a medical professional is advised.

When using cleaning products that contain chlorine, it’s good to be aware of any symptoms that may signal chlorine poisoning. The symptoms, which can result from mild to moderate exposure, include:

- Sudden irritation in the eye, nose, and throat
- Coughing spasms and choking sensation
- Vomiting (that smells like chlorine)
- Changes to the sound of an individual’s voice, either becoming more hoarse or high-pitched
- Discomfort in the chest
- Feeling like they may suffocate
If these symptoms are present, or they're accompanied by dizziness, nausea, or a headache, it's critical to seek help right away. Contact the Poison Control Center [2] or call the national hotline at (800) 222-1222.

Generally speaking, it's best to avoid inhaling household cleaning products as it can be dangerous, but this is especially true for those who suffer from heart conditions or chronic respiratory problems (such as asthma or emphysema). Inhaling chlorine gas can pose health risks, particularly for those with pulmonary disease, bronchitis, or chronic lung conditions. Even for those without these conditions, product safety is critical in the prevention of illness and injury. Here are a few strategies to minimize the impact of these cleaning products:

- Keep exposure to fume-emitting products to a minimum by limiting time spent using products, avoiding breathing in vapors, mist, or gas, and opening a window or turning on a fan to allow for proper ventilation.
- Wear protective gear such as a mask, gloves, clothing, and goggles to protect the eyes, skin, and respiratory system from splashes and fumes.
- Wear glasses rather than contact lenses when working with solvents.
- Try to keep the chemicals from going down the drain.
- Avoid exposing cleaning products to flames.
- When handling containers with nozzles, keep the opening away from people.
- Ensure the opening of the container is tightly closed to prevent additional fumes from being released.
- Avoid cross contamination by keeping hands and the area where the product was used clean.
- Keep all household products in their original labeled containers, and never reuse product containers for anything else.
- Try to avoid sniffing containers to figure out what's inside.

In addition to taking precautionary measures, it's not wise to combine certain cleaning products:

- **Bleach and ammonia**: Ammonia, which is another common chemical, is often found in paint products and some glass and window cleaners. Interestingly, it’s also found in urine, so be careful when cleaning out those cat litter boxes or using diaper pails! Being exposed to this combination of chemicals can cause toxic gases (called chloramines) to be produced, and often leads to irritation in the throat, nose, and eyes.
- **Bleach and acids**: Acid cleaning products include vinegar, some types of glass and window cleaners, automatic dishwasher detergents and rinses, toilet bowl cleaners, drain cleaners, lime, calcium and rust removal products, and brick and concrete cleaners. This combination of chemicals also results in the production of chlorine gas. Individuals exposed to this gas may experience anything from irritation of the eyes and skin to death.
- **Two drain cleaners**: It’s best to use only one drain cleaner at a time because depending on the composition of the cleaners, they may release chlorine gas if they interact inside the pipes.

Though you didn't ask specifically, it seems worth it to mention that while there’s a growing trend of creating homemade cleaning products, it’s not always the safer option. Often, recipes for such products aren’t from empirical resources, and therefore, aren’t backed by research. According to
the Environmental Protection Agency (EPA), homemade cleaning products are useful and generally safe, but there are some exceptions. For example, Borax (sodium borate) is typically recommended as an ingredient for safer homemade cleaning products, but it’s been associated with reproductive, developmental, and neurological hazards. Making cleaning products at home involves mixing different chemicals, and if done without prior and proper research, could be dangerous. Therefore, as with chlorine-based cleaning products, use caution when creating homemade products. If you’re looking for a safe and environmentally-friendly product, check out EPA approved [3] Safer Choice products. In order to qualify for this classification, each ingredient in the product must be among the safest in its ingredient class.

All in all, it’s best to do your research, check warning labels on products, and keep the Poison Control center number around when cleaning with harsh chemicals. Take care, Mr. Clean!

Alice!
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Environmental Health [5]
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[3] https://www.epa.gov/saferchoice