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Information on Chemicals in Everyday Products

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Quaternary Ammonium Compounds (Quats)

Quaternary ammonium compounds, also called quats or QACs, are a group of chemicals used for a variety of purposes including as preservatives, surfactants, antistatic agents, and as active ingredients in disinfectants and sanitizers.

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Key Points/Overview

Quats can be highly effective at killing bacteria, fungi and viruses, including SARS-CoV-2, the virus that causes COVID-19, and are found in many common disinfectant products.

For wastewater treatment, quats can help control growth of microorganisms. Quats added to swimming pools, hot tubs and public fountains can help disinfect the water and control algae.

Quats are also used for wood preservation to help prevent decay caused by fungi and insects. Quats can prevent textile fibers from accumulating mold and fungi and prevent mold and mildew from damaging leather fibers.

The EPA and other authorities regulate disinfecting products, including those containing quats. In the United States, quat-based ingredients undergo rigorous testing to determine that they will not have an unreasonable adverse effect on human health and the environment when used as directed.

Uses & Benefits

Quats are used in a variety of products and processes, including cleaning products, water purification, wood preservation and textile manufacturing.

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Disinfectant and Cleaning Products

Quats are a key ingredient in many cleaning and disinfection products, including dishwashing liquids, window and all-purpose cleaners, hand soaps, air fresheners and disinfectant sprays used in health care facilities, hospitals, schools, offices and households. [Quats used in these products](#) can help kill bacteria and germs, such as salmonella and staphylococcus aureus, to help prevent illnesses and infection from spreading from person to person.



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Water Purification

For wastewater treatment, quats can help control growth of microorganisms. Quats added to swimming pools, hot tubs and public fountains help disinfect the water and control algae.



Wood Preservation

Alkaline copper quaternary is a water-based solution that can help preserve wood products by preventing decay caused by fungi and insects. Products that contain quat solutions can be used for building and utility poles, fence posts, decks, marine walls and other wood structures.

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Textile and Leather Manufacturing

Quats protect textile fibers from accumulating mold and fungi and also can act as a moth repellent. Quats also prevent mold and mildew from damaging leather fibers.



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Safety Information

Disinfecting products, including those containing quats, are regulated and evaluated by the [U.S. Environmental Protection Agency \(EPA\)](#) and other authorities. In the United States, quat-based ingredients undergo rigorous testing to determine that they will not have an unreasonable adverse effect on human health and the environment when used as directed.

Exposure to Quats

Direct consumer contact with quats can occur through product spillage and may cause skin dermatitis, or inflammation, and eye and mucus membrane irritation. Workplace exposure may cause asthma symptoms.

When picking a disinfectant product, choose one that is labelled for use on the surface you want to disinfect. Additionally, product directions on the label should be followed so that the product is effective and handled properly.

Public health experts have made several safety recommendations to mitigate potential effects of exposure to quats. People using products containing quats should follow the label instructions and use it only for its intended purpose. As with most cleaning products, products containing quats should be stored in their original containers and not mixed with other cleaning products.

FAQs

What are quaternary ammonium compounds (QACs/Quats)? ^

Quats are a group of chemicals used for a variety of purposes, including as preservatives, surfactants, antistatic agents and as active ingredients for disinfectants and sanitizers. Quats have been shown to be highly effective at killing bacteria, fungi and viruses, including SARS-CoV-2, the virus that causes COVID-19, and are found in many common disinfectant products.

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Why are quats added to cleaning supplies? ^

Quats are included in cleaning supplies to help [kill germs and bacteria](#). Quats contain

positively-charged particles that bind to the negatively-charged cells in bacteria. Once the quat attaches itself to the bacteria's cells, it can break down the cell's wall and destroys it.

Are quats safe?

Disinfecting products, including those with quats are highly regulated and evaluated by the EPA and the U.S. Food and Drug Administration, as well as many international authorities such as the European Commission. For products containing quats to make it to the market, they must undergo a high level of rigorous testing in order to determine the impacts they may have on human health and the environment. Products can only be registered if data show that the intended uses (as described on the product labels) are safe when used as directed.

As with all cleaning products, quat-based disinfectant cleaners should only be used according to the directions on the label. Such products should NEVER be ingested or injected. If you are experiencing any issues due to an accidental spill on your skin, eye exposure, inhalation or ingestion, read the first aid instructions on the product label and if necessary, contact your local poison control center or 911.

What is the EPA toxicity for quats?

Despite the duration and prevalence of their use in commercial and consumer products, few studies have assessed the toxicity of single QACs. The majority of studies investigating the toxicity of single QACs are unpublished company reports which indicate weight reduction as the main effect in mice.

Are quats bad for the environment?

Quats are biodegradable and do not accumulate in the environment. Though some can be toxic to marine animals, tests also show that quats don't accumulate in organisms either. Other environmental compounds help to break down the chemical so that it doesn't spread through the ecosystem.

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Are products containing Quats effective against SARS-CoV-2, the virus that

causes COVID-19?

Certain quat-based disinfectants are effective against SARS-CoV-2. EPA's "[List N. Disinfectants against Coronavirus \(COVID-19\)](#)" includes many Quat-based disinfectants that can be used against SARS-CoV-2. The criteria for inclusion on this list include either having been tested against SARS-CoV-2 or having demonstrated efficacy against a harder to kill virus or a human coronavirus that is similar to SARS-CoV-2.

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[U.S. Environmental Protection Agency](#)



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Cleaning Products

Cleaning products play an essential role in people's daily lives by removing soils, germs, and other contaminants to help prevent the spread of infectious diseases and control allergens, such as dust and mold.

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Using Disinfectant Products Safely

Disinfectant products can effectively reduce germs that can make us sick. However, it's important to know how to use these products safely to prevent accidental poisonings and other serious injuries.

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