

# **CHEMICAL SAFETY AWARENESS WHEN CLEANING GLASS COLLECTIBLES**

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In our continuing efforts to display and restore our glass treasures, many choose to use chemicals to clean their acquisitions. However, many of these compounds and substances can be hazardous or even fatal if proper safety precautions are not adhered to. Rather than focus on cleaning tips and techniques, the author addresses hazards, which may not be immediately obvious, and precautions that should be taken when using some of the chemicals that we often employ to clean bottles and insulators.

Most collectors want to preserve and display their collectibles in as clean and pristine condition as possible. By the nature of their use and disposal, glass bottles and insulators present more challenges to the cleaning and restoration processes than many other collectibles do, and most collectors have experimented with different cleaning agents and methods to effectively accomplish these processes. Rather than focus on cleaning tips and techniques, I'd like to address some hazards, which may not be immediately obvious, and precautions that should be taken when using some of the chemicals that are often used to clean bottles and insulators. A recent and excellent article on cleaning techniques can be found in the November 1995 issue of *Antique Bottle & Glass Collector*.

There are many hazardous chemicals -- particularly acids, bases and solvents—that are routinely utilized by collectors to clean their antique glass, and you don't have to be a "rocket scientist" to be able to procure them. Many can be purchased at your local drugstore, hardware store or builder's supply center, as they are sold for such other uses as stone and concrete cleaning, wood bleaching, metal cleaning, paint & tar removal, etc. Some are even marketed specifically for cleaning and removing stains from antique bottles and glass. It is of the utmost importance that you understand the chemicals that you choose to work with, that you are aware of their hazards and that you follow proper safety precautions and practices when using them!

There are two important sources of information about chemical hazards that are available to a user -- labels and Material Safety Data Sheets (MSDS). Knowing how to properly read labels is important, and it is the legal right of every user to know the contents of a product, or at least the hazards associated with the product, if the ingredients are proprietary. MSDSs, which serve as standards for hazard communication in laboratories, schools and industry, contain in-depth information about a chemical's properties, hazards, precautions and control measures. If a supplier cannot provide you with an MSDS at the time of purchase of a specific chemical, contact the manufacturer or distributor for a copy. If you have difficulty in obtaining an MSDS on a specific chemical, contact me and I'll try to supply you with a copy.

When using a specific chemical, there are three main areas dealing with personal safety that you should be aware of: the chemical's corrosiveness, toxicity and its reactivity/incompatibility with other substances. As a minimum, use the following safety practices when using other than common, safe household cleaning agents: know the chemicals, wear proper chemical-resistant gloves and clothing for skin protection, wear goggles or proper eye protection and/or use a Plexiglas "splash shield", work in an area with adequate ventilation and use good housekeeping practices! Always store chemicals safely, and keep any long-term soaking-baths covered and located where curious children or pets can't get into them. In case of skin or eye contact with most of the chemicals of concern here, immediate first aid would be to flush the exposed area with plenty of water and seek medical attention, as necessary. Follow local laws and safe practices for the proper disposal of spent chemicals and cleaning solutions.

Corrosive and/or toxic materials cannot be simply washed down a sewer, dumped in a stream or landfill or allowed to get into your home septic system!

Never mix chemicals or cleaning agents with the anticipation that they'll do a better cleaning job unless you are sure that they will interact safely. Mixing incompatible substances could result in a release of heat accompanied by violent boiling and splattering (e.g., via the addition of water to concentrated mineral acids), the release of toxic or deadly gases (e.g., mixing acids with bleaches or cleansers) or combustion (e.g., mixing acids with organic solvents).

Using strong mineral acids, such as hydrochloric acid (i.e., muriatic acid) or sulfuric acid (i.e., oil of vitriol), to clean antique glass is not worth the risks to your personal safety unless you are trained in their safe use and handling. The liquids and vapors are extremely corrosive and cause severe burns to all body tissue, they can react violently with many incompatible substances (e.g., strong bases, metals, metal salts, organics, other acids, water, combustible materials) and they are harmful to the environment. Adding water to concentrated mineral acids is very dangerous, and the heat generated could easily crack the fragile glass object containing the mixture. Strong bases such as sodium hydroxide (i.e., caustic soda or lye) are also very corrosive and can cause severe burns to the skin, and they will also attack and dull "soft" glass upon prolonged exposure.

Oxalic acid is routinely used as a cleaning agent in the bottle and insulator hobby. Dissolving the white crystals in water results in a mildly acidic cleaning solution; as it will not immediately burn the skin as a mineral acid or caustic solution will do, a user may think that the use of chemical-resistant gloves is an unnecessary precaution. Besides being corrosive, oxalic acid is extremely toxic and can be absorbed directly through the skin, possibly resulting in symptoms similar to those seen from acute ingestion of the compound. Local and/or systemic effects of this toxin can be severe and can result in death. The compound complexes with calcium in the body, and kidney or brain damage could result from the formation of calcium oxalate deposits if sufficient amounts are absorbed or ingested. Oxalic acid is also found as an ingredient in some commercial powdered cleansers.

Ammonium bifluoride is another extremely hazardous crystalline compound that is often used in cleaning and removing stains from bottles and insulators. A solution of dangerous and highly corrosive hydrofluoric acid is formed when this and similar salts are dissolved in water. This acid readily attacks and dissolves glass, and it could easily do more harm than good to your antique glass object. Early "soft" glass and cobalt glass formulations are especially susceptible to attack. If allowed to come in contact with your skin, the acid is readily absorbed - resulting in bone decalcification, slow-healing tissue damage, burning and blistering underneath the skin, which is accompanied by excruciating pain!

Use proper personal protection when cleaning with organic solvents, paint thinners, kerosene, etc., also. Prolonged skin exposure can result in dermatitis, vapors are harmful, these substances are highly flammable and some are even carcinogenic (cancer-causing).

Armed with a non-scratching powdered cleanser and nylon pad, detergent, bottle brushes, a toothbrush and elbow grease, I've found that most of my glass collectibles can be satisfactorily cleaned and restored without resorting to the use of hazardous chemicals. Presoaking in common cleaning agents (Lestoil, for example) can be very effective in loosening years of accumulated soot and grime. However you choose to clean your bottles and insulators, be informed, be cautious, act responsibly and use common sense!

~Rick Baldwin,

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