

CLEANING CHEMICALS - IMPACTS AND ALTERNATIVES

What is this Action Sheet about?







Scientists have developed many different chemicals for use in the home and the workplace. Sometimes, they are good for our health – for example, in hospitals where disease-carrying bacteria and dirt are dangerous for patients. However, many commonly used chemicals can actually harm human health and the environment. Use with great care at home and at work. Even better, choose to use the alternatives described below.

Take the Household Toxics Tour

Toxic chemicals in the home can be eliminated simply by making thoughtful choices after educating oneself about where the hazards are in common consumer products. How can you determine what toxics you have in your home? Take this “toxics tour.”






In the Kitchen

All-purpose cleaner, ammonia-based cleaners, bleach, brass or other metal polishes, dishwasher detergent, disinfectant, drain cleaner, floor wax or polish, glass cleaner, dishwashing detergent, oven cleaner, and scouring powder contain dangerous chemicals. Some examples are:

-  sodium hypochlorite (in chlorine bleach): if mixed with ammonia, releases toxic chloramine gas. Short-term exposure may cause mild asthmatic symptoms or more serious respiratory problems;
-  petroleum distillates (in metal polishes): short-term exposure can cause temporary eye clouding; longer exposure can damage the nervous system, skin, kidneys, and eyes;
-  ammonia (in glass cleaner): eye irritant, can cause headaches and lung irritation;
-  phenol and cresol (in disinfectants): corrosive; can cause diarrhea, fainting, dizziness, and kidney and liver damage;
-  nitrobenzene (in furniture and floor polishes): can cause skin discoloration, shallow breathing, vomiting, and death; associated with cancer and birth defects;
-  formaldehyde (a preservative in many products): suspected human carcinogen; strong irritant to eyes, throat, skin, and lungs.

In the Utility Closet

A number of products are likely to contain toxic ingredients: carpet cleaner, room deodorizer, laundry softener, laundry detergent, anti-cling sheets, mold and mildew cleaner, mothballs, and spot remover all usually contain irritant or toxic substances. Examples:

-  perchloroethylene or 1-1-1 trichloroethane solvents (in spot removers and carpet cleaners): can cause liver and kidney damage if ingested; perchloroethylene is an animal carcinogen and suspected human carcinogen;
-  naphthalene or paradichlorobenzene (in mothballs): naphthalene is a suspected human carcinogen that may damage eyes, blood, liver, kidneys, skin, and the central nervous system; paradichlorobenzene can harm the central nervous system, liver, and kidneys;
-  hydrochloric acid or sodium acid sulfate in toilet bowl cleaner; either can burn the skin or cause vomiting diarrhea and stomach burns if swallowed; also can cause blindness if inadvertently splashed in the eyes;
-  residues from fabric softeners, as well as the fragrances commonly used in them, can be irritating to susceptible people;
-  possible ingredients of spray starch (aside from the starch) include formaldehyde, phenol, and pentachlorophenol; in addition, any aerosolized particle, including cornstarch, may irritate the lungs.

In the Living Room and Bedroom

Even shop-bought home furnishings can be harmful. Fabrics that are labeled “wrinkle-resistant” are usually treated with a formaldehyde resin. These include no-iron sheets and bedding, curtains, sleep wear — any woven fabric, but especially polyester/cotton blends, marketed as “permanent press” or “easy care.” More modern furniture is made of pressed wood products emits formaldehyde and other chemicals. Carpeting is usually made of synthetic fibers that have been treated with pesticides and fungicide. Many office carpets emit a chemical called 4-phenylcyclohexene, an inadvertent additive to the latex backing used in more commercial and home carpets, which is thought to be one of the chemicals responsible for “sick” office buildings - buildings where people feel ill just by breathing the air.






In the Bath

Numerous cosmetics and personal hygiene products contain hazardous substances. Examples:

- cresol, formaldehyde, glycols, nitrates/nitrosamines and sulfur compounds in shampoos;
- butane propellants in hair spray (replacing carcinogenic methylene chloride), as well as formaldehyde resins;
- aerosol propellants, ammonia, formaldehyde, triclosan, aluminum chlorhydrate in antiperspirants and deodorants’
- glycols, phenol, fragrance, and colors in lotions, creams, and moisturizers.

In the Garage

A number of dangerous substances are frequently present, including paint, paint thinner, benzene, kerosene, mineral spirits, turpentine, lubricating/motor oils, and gasoline. Hazards among them include these chemicals:

-  chlorinated aliphatic and aromatic hydrocarbons in paint thinner can cause liver and kidney damage;
-  petroleum hydrocarbons, an ingredient of gasoline, motor oils, and benzene, are associated with skin and lung cancer;
-  mineral spirits in oil-based paint are a skin, eye, nose throat, and lung irritant. High air concentrations can cause nervous system damage, unconsciousness and death;
-  ketones in paint thinner may cause respiratory ailments; vary according to specific form of the chemical;
-  ketones and toluene in wood putty; toluene is highly toxic, may cause skin, kidney, liver, central nervous system damage; may damage reproductive system.

In the Garden

Pesticides, one of the most important single hazards in the home. Around 1,400 pesticides, herbicides, and fungicides are ingredients in consumer products. Combined with other toxic substances such as solvents, pesticides are present in more than 34,000 different product formulations.

Are there safe substitutes for these household toxics?

Until World War II and the Chemical Age that followed war-related research, householders all around the world used a limited number of simple substances to keep most objects in the house clean, order-free, and pest-free. Soap, vinegar, baking soda, washing soda, ammonia, borax, alcohol, cornstarch, and certain food ingredients were used to lift out spots and stains, deodorize, polish wood or metal, disinfect, scrub, repel pests, clean pets, wash and starch clothes, and to perform countless other household tasks. Simple cosmetic preparations kept hair lustrous and skin supplied with the aid of ingredients such as eggs, oil, clay, vinegar, and herbs. The garden was fertilized and pests were kept down with naturally occurring substances. Weeds were weeded by hand. Even though some natural pesticides, like nicotine and rotenone, were indeed toxic to humans, they were not persistent in the environment. They degrade soon after application. Pyrethrum, a pesticide derived from a variety of chrysanthemum that is nontoxic to mammals, controlled a wide spectrum of pests. Although it is still widely used, it is usually mixed with other chemicals to increase its potency.

But toxic materials also were present in homes of the past. Not knowing enough about their hazards, housewives used such chemicals as arsenic, lead, and mercury to perform certain household chores. Interior and exterior paints were often made with lead; many children are still living with the legacy of lead poisoning caused by eating chips of leaded paint. Asbestos, called a miracle mineral when its fire-resistant properties were discovered, is now known to be a cancer causer that contaminates hundreds of thousands of residences, schools, and other buildings around the world.

We do not need to return to the ways of the past to avoid exposure to house toxics, but we can take some lessons from the past for a better future.

How can we do this?

Use Safe Substitutes: For example, buy or make soap-based garden insecticide instead of chemically-based ones (See Action Sheet 33).

When in Doubt, Leave it Out: In cases where there is no effective safe substitute for a toxic product, reevaluate how important the goal really is. Must you absolutely get rid of all insects in your garden, or can you live with some chewed-up leaves? If the goal is absolutely imperative, such as ensuring that termites do not invade your house, it is important to educate yourself thoroughly. You may find more healthful alternatives than the local pest company tells you.



Safe Substitutes in the Kitchen and Bath

One shelf of simple and relatively safe ingredients can be used to perform most home cleaning chores. All that's needed is a knowledge of how they work and how different ingredients should be combined to get the cleaning power needed for a specific job.

Baking Soda is sodium bicarbonate. It has a number of useful properties. It can neutralize acid, scrub shiny materials without scratching, deodorize, and extinguish grease fires. It can be used as a deodorizer in the refrigerator, on smelly carpets, on upholstery and on vinyl. It can help deodorize drains. It can clean and polish aluminum, chrome, jewelry, plastic, porcelain, silver, stainless steel, and tin. It also softens fabrics and removes certain stains. Baking soda can soften hard water and makes a relaxing bath time soak; it can be used as an underarm deodorant and as a toothpaste, too.

Borax is a naturally occurring mineral, soluble in water. It can deodorize, inhibit the growth of mildew and mold, boost the cleaning power of soap or detergent, remove stains, and can be used with attractants such as sugar to kill cockroaches.

Cornstarch, derived from corn, can be used to clean windows, polish furniture, shampoo carpets and rugs, and starch clothes.

Isopropyl Alcohol is an excellent disinfectant.

Lemon Juice, which contains citric acid, is a deodorant and can be used to clean glass and remove stains from aluminum, clothes, and porcelain. It is a mild lightener or bleach if used with sunlight.

Mineral Oil, derived from seeds, is an ingredient in several furniture polish and floor wax recipes.

Soap (NOT detergent) is made in several ways. Castle soap can be used as a shampoo or as a body soap. Olive-oil based soap is gentlest to the skin. An all-purpose liquid soap can be made by simple dissolving the old ends of bar soap (or grated slivers of bar soap) in warm water (See Action Sheet X).

Steel Wool is an abrasive strong enough to remove rust and stubborn food residues and to scour barbecue grills.

TSP is trisodium phosphate, a mixture of soda ash and phosphoric acid. TSP is toxic if swallowed, but it can be used on many jobs, such as cleaning drains or removing old paint, that would normally require much more caustic and poisonous chemicals, and it does not create any fumes.

Vinegar is made from soured applied juice, grain, or wine. It contains about 5 percent acetic acid, which makes it a mild acid. Vinegar can dissolve mineral deposits, grease, remove traces of soap, remove mildew or wax build-up, polish some metals, and deodorize. Vinegar can clean brick or stone, and is an ingredient in some natural carpet cleaning recipes. Use vinegar to clean out the metallic taste in coffeepots and to shine windows without streaking. Vinegar is normally used in a solution with water, but it can be used straight.

Washing Soda or SAL Soda is a sodium carbonate decahydrate, a mineral. It can cut stubborn grease on grills, broiler pans, and ovens. It can be used with soda instead of laundry detergent, and it softens hard water. These items are available from drug and chemical-supply stores.

 **For common household tasks, try these nontoxic strategies using the above ingredients:**

Freshen air by opening windows and doors for a short period; distribute partially filled dishes of vinegar around the kitchen to combat unpleasant cooking odors; boil cinnamon and cloves in a pan of water to scent the air; sprinkle 1/2 cup borax in the bottom of garbage pails or diaper pails to inhibit mold and bacteria growth that can cause odors; rub vinegar on hands before and after slicing onions to remove the smell; use bowls of potpourri to give inside air a pleasant scent.

All-purpose cleaner can be made from a vinegar-and-salt mixture or from 4 tablespoons baking soda dissolved in 1 quart warm water.

Disinfectant means anything that will reduce the number of harmful bacteria on a surface. Practically no surface treatment will completely eliminate bacteria. Try regular cleaning with soap and hot water. Or mix 1/2 cup borax into 1 gallon of hot water to disinfect and deodorize. Isopropyl alcohol is an excellent disinfectant, but use gloves and keep it away from children.

Drain cleaner. Try a plunger first, though not after using any commercial drain opener. To open clogs, pour 1/2 cup baking soda down drain, add 1/2 cup white vinegar, and cover the drain. The resulting chemical reaction can break fatty acids down into the soap and glycerine, allowing the clog to wash down the drain. Again, do not use this method after trying a commercial drain opener—the vinegar can react with the drain opener to create dangerous fumes.

Floor cleaner and polish can be as simple as a few drops of vinegar in the cleaning water to remove soap traces. For vinyl or linoleum, add a capful of baby oil to the water to preserve and polish. For wood floors, apply a thin coat of 1:1 oil and vinegar and rub in well. For painted wooden floors, mix 1 teaspoon washing soda into 1 gallon hot water. For brick and stone tiles, use 1 cup white vinegar in 1 gallon water and rinse with clear water.

Metal cleaners and polishes are different for each metal — just as in commercial cleaners. Clean aluminum with a solution of cream of tartar and water. Brass may be polished with a soft cloth dipped in lemon-and-baking-soda solution, or vinegar- and-salt solution. Polish chrome with baby oil, vinegar, or aluminum foil shiny side out. Clean tarnished copper by boiling the article in a pot of water with 1 tablespoon salt and 1 cup white vinegar, or try differing mixtures of salt, vinegar, baking soda, lemon juice, and cream of tartar. Clean gold with toothpaste, pewter with a paste of salt, vinegar, and flour. Silver can be polished by boiling it in a pan lined with aluminum foil and filled with water to which a teaspoon each of baking soda and salt have been added. Stainless steel can be cleaned with undiluted white vinegar.

Oven cleaner. Sprinkle baking soda on moist surface and scrub with steel wool.

Scouring powder can be made from baking soda or dry table salt.

Toilet bowl cleaner can be made from straight bleach (do NOT mix with any other substance except water), baking soda and vinegar, or borax and lemon juice.

Tub and tile cleaner can be as easy as rubbing in baking soda with a damp sponge and rinsing, or wiping with vinegar first and following with baking soda as a scouring powder.

Window and glass cleaner is easy with these tips: to avoid streaks, don't wash windows when the sun is shining. Use a vinegar-and-water solution, cornstarch-vinegar-and-water solution, or lemon-juice-and-water. Wipe with newspaper unless you are sensitive to the inks in newsprint.



Safe Substitutes for Laundry Products

Detergent is specially adapted to clean synthetic fabrics, and it has the added advantage of not leaving soil residues even in hard water. However, detergents are generally derived from petrochemicals, and people sensitive to these compounds may find it hard to tolerate detergents or the fragrances they are scented with. In addition, most detergents contain phosphates, which build up in streams and lakes and upset the natural balance in waterways, causing blooms of algae which deplete the dissolved oxygen fish need to live. Some detergent may even contain naphthalene or phenol, both hazardous substances.

An effective alternative to using detergents is to return to soap. Soap is an effective cleaner for natural fabrics, leaving such items as diapers softer than detergent can. For cotton and linen, use soap to soften water. A cup of vinegar added to the wash can help keep colors bright (but DO NOT use vinegar if you are using bleach — the resulting fumes are hazardous). One-half to three-quarters of a cup of baking soda will leave clothes soft and fresh smelling. Silks and wools may be hand washed with mild soap or a protein shampoo, down or feathers with mild soap or baking soda.

For synthetic fabrics or blends (including most no-iron fabrics), there may be biodegradable detergents on the market that do not contain phosphates, fragrances, or harsh chemicals. They may be often imported from abroad and available at health food shops or by mail order.



Safe Substitutes for Personal Hygiene and Cosmetic Products

We use cosmetics and hygiene products for a fairly narrow range of reasons: to keep skin moist and supple; to clean hair without stripping it of natural oils; to eliminate unpleasant body or mouth odors; to prevent skin oiliness and clogged skin pores; and simply for the pleasure of relaxing and pampering ourselves with body-care or facial-care treatments. The following ingredients can help achieve these purposes without the use of toxic additives, synthetic fragrances, or artificial colorings:

Moisturizers and conditioners: egg yolk, milk, yogurt, safflower oil (for light moisturizing), olive oil (for dry skin or hair), water, oatmeal, jojoba oil.

Astringents/after shaves: witch hazel, diluted isopropyl alcohol.

Deodorants: baking soda, white clay, deodorant crystals.

Toothpastes: baking soda, salt.

Soaps cleansing agents: castle soap, olive-oil based soap.

Perfumes: essential oils provide nontoxic fragrances that can be used to scent shampoo, bath soaks, or even, in the case of peppermint, to flavor toothpaste.

Although it's easy to make healthful alternatives to many cosmetic and hygiene products, you might find a natural health store that has a selection of shampoos, moisturizers, toothpastes, after shaves, soaps, and bath products that do not contain the harmful ingredients in many commercial preparations.



Safe Substitutes for Pesticides in Home and Garden

Against pests in the home, the best offence is a good defence. The first step is to make the house — especially the kitchen — unattractive to insects by cleaning up food spills immediately, keeping hard-to-reach areas reasonably clean, and removing clutter that can hide pests. Store foods attractive to pests, such as flour, in the refrigerator. Water attracts pests, so leaky faucets and pipes should be promptly repaired. Doors and windows should be well screened. Cloths should be regularly cleaned and aired, and properly stored in paper or cardboard boxes sealed against moths.

A number of nontoxic substances can be used to repel insects. Generally, they are highly fragrant or volatile herbs or spices. Powdered red chill pepper, peppermint, bay leaves, cloves, citrus oil, lavender, rosemary, tobacco, peppercorns, and cedar oil can repel various types of insects.

Insects can be trapped and killed without resorting to dangerous chemicals: Generally a poison nontoxic to humans is mixed with a food that insects find attractive, and spread in the infested area. Examples are oatmeal (attractive) and plaster-of-Paris (poisonous), and cocoa powder and flour (attractive) and borax (poisonous). Old-fashioned flypaper — not a hanging strip of insecticide — is an effective trap. For specific house pests, try these solutions:

For ants: sprinkle powdered red chill pepper, paprika, dried peppermint, or borax where the ants are entering.

For beetles: Kill manually when you see them.

For cockroaches: Mix by stirring and sifting 1 ounce TSP (trisodium phosphate — use may be limited due to regulations on phosphates), 6 ounces borax, 4 ounces sugar, and 8 ounces flour. Spread on floor of infested area. Repeat after 4 days and again after 2 weeks.

For fleas: Feed pet brewer's yeast in powder mixed with food or by tablets.

For moths: Air clothes well in the sun; store in airtight containers, and scatter sachets of lavender, cedar chips, or dried tobacco in with clothing.

For rats and mice: Again, prevention may be the best cure. Holes in exterior or interior walls should be closed off and storage spaces kept orderly. Garbage should be kept tightly covered. To catch rodents, the most efficient system is the oldest: a cat. Next best are mouse and rat traps.

For termites: Any wooden parts of the house should be at least 18 inches off the ground, as subterranean termites cannot tolerate being exposed to air and light. They have to build easily visible mud tunnels to get at available wood. However, many houses have only about an 8-inch clearance between wooden parts and the ground, which makes the wood vulnerable. Metal shields may help discourage termites, but they cannot prevent infestations. If you have an infestation, investigate the safest option for control.

For gardens: In hardware stores, look for or make safer insecticides that use soap-and water solution to get rid of aphids, or pyrethrum for a number of applications. As more and more people understand the hazards of organic chemicals in the home, market pressure will encourage the introduction of safer products.

Several naturally derived pesticides exist which, in some cases, are less toxic to humans than the organophosphates, carbamates, or organochlorines now widely used. Nicotine is the most toxic, poisonous both to humans and to other mammals, as well as to birds and fish. It is not available commercially for home gardeners because of its hazards. Rotenone, moderately toxic to humans, kills a wide range of insects; however, it should never be used near a waterway, as it is very toxic to fish. Pyrethrum is relatively nontoxic to humans and only slightly toxic to aquatic life, so it may be the best choice for home gardens. See Action Sheet X for safe ways to handle pests and diseases.

For lawns: Herbicides are most often used to kill “unsightly” weeds in gardens and yards, and by lawn care companies to maintain the perfect appearance of turf around homes and on lawns and golf courses. Basically, the safe alternative to herbicides is simple: pull weeds by hand. There are no really safe herbicides.

The Safe Home of the 21st Century

Indoor pollutants have proliferated in recent years, often either because modern construction techniques and furnishings manufacturers utilize hazardous materials or because consumers do not know enough about the products they buy to make informed choices. But safe, nontoxic alternatives exist for nearly every real need around the home, and the search for them may help consumers distinguish between what they really do need, and what may be “luxuries” that could compromise their families’ health.

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