

The Dirty Dozen Chemicals in Cosmetics by Catherine Zandonella, M.P.H

Beauty is only skin deep, but the products we use to attain it contain chemicals that may penetrate far deeper. The average adult uses nine personal care products a day, with roughly 120 chemicals spread among them, many of which are incompletely tested for toxicity.

Below we've listed 12 chemicals that are best avoided. A single exposure to any of them is unlikely to cause harm, but daily exposure over a lifetime may add up. When shopping, be prepared to spend some time reading labels; even brands that advertise themselves as "natural" or "botanical" have been known to include some of these (see our Smart Shopper's Dirty Dozen Ingredients card).

1. Antibacterials

Overuse of antibacterials can prevent them from effectively fighting disease-causing germs like *E. coli* and *Salmonella enterica*. Triclosan, widely used in soaps, toothpastes and deodorants, has been detected in breast milk, and one recent study found that it interferes with testosterone activity in cells. Numerous studies have found that washing with regular soap and warm water is just as effective at killing germs.

2. Coal Tar

Coal tar is a known human carcinogen used as an active ingredient in dandruff shampoos and anti-itch creams. Coal-tar-based dyes such as FD&C Blue 1, used in toothpastes, and FD&C Green 3, used in mouthwash, have been found to be carcinogenic in animal studies when injected under skin.

3. Diethanolamine (DEA)

DEA is a possible hormone disruptor, has shown limited evidence of carcinogenicity and depletes the body of choline needed for fetal brain development. DEA can also show up as a contaminant in products containing related chemicals, such as cocamide DEA.

4. 1,4-Dioxane

1,4-Dioxane is a known animal carcinogen and a possible human carcinogen that can appear as a contaminant in products containing sodium lauryl sulfate and ingredients that include the terms "PEG," "-xynol," "cetareth," "oleth" and most other ethoxylated "eth" ingredients. The FDA monitors products for the contaminant but has not yet recommended an exposure limit. Manufacturers can remove dioxane through a process called vacuum stripping, but a small amount usually remains. A 2007 survey by the Campaign for Safe Cosmetics found that most children's bath products contain 10 parts per million or less, but an earlier 2001 survey by the FDA found levels in excess of 85 parts per million.

5. Formaldehyde

Formaldehyde has a long list of adverse health effects, including immune-system toxicity, respiratory irritation and cancer in humans. Yet it still turns up in baby bath soap, nail polish, eyelash adhesive and hair dyes as a contaminant or break-down product of diazolidinyl urea, imidazolidinyl urea and quaternium compounds.

6. Fragrance

The catchall term "fragrance" may mask phthalates, which act as endocrine disruptors and may cause obesity and reproductive and developmental harm. Avoid phthalates by selecting essential-oil fragrances instead.

7. Lead and Mercury

Neurotoxic lead may appear in products as a naturally occurring contaminant of hydrated silica, one of the ingredients in toothpaste, and lead acetate is found in some brands of men's hair dye. Brain-damaging mercury, found in the preservative thimerosal, is used in some mascaras.

8. Nanoparticles

Tiny nanoparticles, which may penetrate the skin and damage brain cells, are appearing in an increasing number of cosmetics and sunscreens. Most problematic are zinc oxide and titanium dioxide nanoparticles, used in sunscreens to make them transparent. When possible, look for sunscreens containing particles of these ingredients larger than 100 nanometers. You'll most likely need to call companies to confirm sizes, but a few manufacturers have started advertising their lack of nanoparticle-sized ingredients on labels. For a more complete discussion, see Screen Test: Reading the Micro-Fine Print.

9. Parabens

(methyl-, ethyl-, propyl-, butyl-, isobutyl-) Parabens, which have weak estrogenic effects, are common preservatives that appear in a wide array of toiletries. A study found that butyl paraben damaged sperm formation in the testes of mice, and a relative, sodium methylparaben, is banned in cosmetics by the E.U. Parabens break down in the body into p-hydroxybenzoic acid, which has estrogenic activity in human breast-cancer cell cultures.

10. Petroleum Distillates

Possible human carcinogens, petroleum distillates are prohibited or restricted for use in cosmetics in the E.U. but are found in several U.S. brands of mascara, foot-odor powder and other products. Look out for the terms "petroleum" or "liquid paraffin."

11. P-Phenylenediamine

Commonly found in hair dyes, this chemical can damage the nervous system, cause lung irritation and cause severe allergic reactions. It's also listed as 1,4-Benzenediamine; p-Phenyldiamine and 4-Phenylenediamine.

12. Hydroquinone

Found in skin lighteners and facial moisturizers, hydroquinone is neurotoxic and allergenic, and there's limited evidence that it may cause cancer in lab animals. It may also appear as an impurity not listed on ingredients labels.

What You Can Do

* Complain to your drugstore when you see unhealthy ingredients in their consumer products. They may be unaware.

* Visit www.safecosmetics.org/companies to find companies that have signed the Compact for Safe Cosmetics, a pledge to remove chemicals linked to cancer, birth defects and other health problems.

* Take action in support of your right to buy safe personal care products at www.safecosmetics.org/action.

Resources

* Campaign for Safe Cosmetics: www.safecosmetics.org

* Skin Deep: www.cosmeticdatabase.com

* National Library of Medicine's Household Products Database: www.householdproducts.nlm.nih.gov