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## Toxic Shades- Chemicals in Cosmetics that Matters

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### ABSTRACT

*In our daily life we use variety of cosmetics ranging from shampoo to sophisticated cream that are either categorize as natural products or synthetic but both the ways these predominate products are manufactured containing toxic chemicals either in the form of emulsifier, preservative, disinfectant, solvent, plasticizer, softeners, moisture-carriers etc. While cosmetics are good in promoting charmness and good looking to a person subsequently it also affects the human health in an umpteen ways that one can imagine since cosmetics are made of chemicals which are mostly toxic one way or the other. Even after being washed off at the end of the day it is drained off to the water system thus polluting the aquatic ecosystem in general and environment as a whole. Some of the harmful chemicals and its toxicity are being discussed.*

**Keywords:** Chemicals in cosmetics.

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### INTRODUCTION

The US Environmental Protection Agency has defined pollution as “Any substances in water, soil, or air that degrade the natural quality of the environment, offend the senses of sight, taste, or smell, or cause a health hazard. The usefulness of the natural resource is usually impaired by the presence of pollutants and contaminants [1].

Pollution can be of different types like air pollution, water pollution, soil pollution, visual pollution, light pollution, noise pollution etc. Another type of pollution that can be classed under pollution is that of cosmetic pollution (under Chemical pollution) that directly effects human health because of certain toxic chemicals that are used to make it.

The US Food Drug & Cosmetic Act 1 defines cosmetics as -

(1) articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance

(2) articles intended for use as a component of any such articles; except that such term shall not include soap [2].

Some of such toxic chemicals are itemize below [3-8].

1. **Diethanolamine (DEA)** : DEA is used in shampoos, moisturizer, soaps, cleansers etc to make them creamy and foamy and also as a pH adjuster in the product. DEA is a possible hormone disrupter. It reacts with nitriles in the product to form nitrosamines which may cause cancer and also leads to the depletion of choline needed for development of the human fetal brain. Similar effects are also seen with cocamide and lauramide DEA. In a recent study, DEA-based detergents resulted in a major increase in the incidence of two cancers- liver and kidney cancers.
2. **Formaldehyde**: It is used as disinfectant and preservative and is found in baby bath soap, nearly all brands of body products, antiperspirants, nail polish, eyelash adhesive and hair dyes. This chemical is form from Imidazolidinyl Urea and DMDM Hydantoin, Bronopol, Paraformaldehyde, benzylhemiformal, 5-bromo-5-nitro-1,3-dioxane, diazolidinyl urea, Quaternium-15, sodium hydroxymethyl glycinate, and Methenamine in the body. It has a severe health affects including immune-system toxicity, respiratory irritation and cancer in humans.
3. **Sodium Laureth Sulfate (SLES)**: It is possibly the most dangerous of all ingredients in personal care products. It is used in cosmetics as a detergent and also to make products bubble and creamy. SLES are used more widely as one of the major ingredients in cosmetics, toothpaste, hair conditioner and about 90% of all shampoos and products that foam. SLES can cause malformation in children's eyes, and damage to the immune system, especially within the skin. Skin layers may separate and inflame due to its protein denaturing properties. Sodium laureth sulfate may also be contaminated with measurable amounts of ethylene oxide and 1,4-dioxane, which may cause cancer.
4. **Coal Tar Dyes** : Used as an active ingredient in dandruff shampoos and anti-itch creams, toothpastes, mouthwash, hair dyes etc and is believe to be carcinogenic. Some artificial coal tar colors contain heavy metal impurities, including arsenic and lead, which are carcinogenic. The use of permanent or semi-permanent hair color products, particularly black and dark brown colors, is associated with increased incidence of human cancer including lymphoma, myeloma, and Hodgkin's disease.
5. **Talcum Powder (Hydrated Magnesium Silicate and others)** : Found in eye shadow, blush, baby powder, deodorant and soap, face powders, body powders etc used as an anti-moisturizer. It is carcinogenic Talc particles are able to move through the reproductive system and become imbedded in the lining of the ovary that cause tumors in human ovaries, Talc poses a health risk when exposed to the lungs.  
The common household hazard posed by talc is inhalation of baby powder by infants. Talc is used on babies because it absorbs unpleasant moisture. Clearly, dusting with talcum powder endangers an infant's lungs at the prospect of inhalation. Exposing children to this carcinogen is unnecessary and dangerous.
6. **Nanoparticles**: Tiny nanoparticles are appearing in an increasing number of cosmetics and sunscreens, which may penetrate the skin and damage brain cells. zinc oxide and titanium dioxide nanoparticles that are used in sunscreens to make them transparent are the most damaging.
7. **Parabens**: Found mostly in Deodorant, shampoo, cream, baby product, shaving cream,make-up, etc. (methyl-, ethyl-, propyl-, butyl-, isobutyl-) parabens which are common preservatives used in cosmetics have shown hormonal activity. Parabens break down in the body into p-hydroxybenzoic acid, which has estrogenic activity in human breast cancer cell cultures.

- 8. Mineral Oil:** This derived substance, a commonly used petroleum ingredient, coats the skin just like plastic wrap covers any given vessel. The skin's natural immune barrier is disrupted as this plastic coating inhibits its ability to breathe and absorb (moisture and nutrition). Your skin's ability to release toxins is impeded by this "plastic wrap," which can promote acne and other disorders by slowing down normal cell development causing the skin to prematurely age. Baby oil is 100% mineral oil.
- 9. Propylene Glycol (PG):**  
It is used as a wetting and solvent and is an active component in antifreeze. There is no difference between the PG used in industry (paint, floor wax) and the PG used in personal care products. Found in most forms of make-up, hair products, lotions, after-shave, deodorants, mouthwashes and toothpaste. Skin contact, dermatitis, kidney damage and liver abnormalities can inhibit cell growth in human tests and can damage membranes causing rashes, dry skin and surface damage. There is no warning label on products such as stick deodorants, where the concentration is greater than that in most industrial applications, leaving the immune system vulnerable. They are also potentially carcinogenic.
- 10. Lead and Mercury:** Lead and mercury is used as a preservative. 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. Mercury, found in the preservative thimerosal, is used in some mascaras.  
Lead damages the nervous system, leading to decreased learning ability and behavioral deficits, is a reproductive toxin and also an Carcinogen.  
Mercury is toxic to development, as well as to the nervous system and is suspected to have harmful effects on the respiratory system, the kidneys and gastrointestinal and reproductive systems.
- 11. Fragrance:** "Fragrance" is present in most deodorants, shampoos, sunscreens, skin care, body care and baby products. Most or all of them are synthetic and are believed to be carcinogenic or toxic. The catchall term "fragrance" may mask phthalates, which act as endocrine disruptors and may cause obesity and reproductive and developmental harm. Exposure to fragrances can affect the central nervous system, causing depression hyperactivity, irritability, inability to cope, and other behavioral changes".
- 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.

## CONCLUSIONS

It is not uncommon for a given cosmetic to contain multiple ingredients linked to health and environmental hazards, and most of us regularly use several products everyday. A single use of the above toxins may not have the adverse affect on the skin or health but cosmetic are something that we use daily and this is how the effects adds upon during the year.

Therefore more research is needed on the health effects of many chemicals used in cosmetics, particularly effects associated with extended exposure. Chemicals with suspected links to adverse health effects should be prohibited in cosmetics on a precautionary basis unless and until their safety can be demonstrated.

Gisèle, Sherbrooke said, “To ensure ingredients in cosmetics are safe for people and the environment, I think it involves education, information and legislation.”

It is not impossible to make this toxin removed or altered from the products until and unless there is a greater participation of the people using it. Be aware, be wise, be Safe.

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