

COSMETIC HEALTH



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Cosmetics: According to the US Food and Drug Administration (FDA), the law defines cosmetics as “articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body... for cleansing, beautifying, promoting attractiveness, or altering the appearance.” This includes skin moisturizers, perfumes, lipsticks, fingernail polishes, eye and facial makeup, shampoos, permanent waves, hair colors, toothpastes, and deodorants, as well as any component of a cosmetic product. It does not include products used solely as soaps.

Cosmetics are different from drugs, which are defined as “articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease” and “articles (other than food) intended to affect the structure or any function of the body of man or other animals.”

A “cosmetic” is any substance used to clean, improve or change the complexion, skin, hair, nails or teeth. Every day, most of the products like skin cream, aftershave lotion and baby shampoo. Most cosmetics are safe, but they can sometimes cause health problems.

Cosmetics are products applied to the body to clean it, make it more attractive, or change the way it looks. They include Hair dyes, Makeup, Perfumes, Skin-care

creams. Cosmetics that treat or prevent diseases are also drugs. Products such as dandruff shampoo, fluoride toothpaste, and antiperspirant deodorant are both cosmetics and drugs. A good way to tell if our buying a cosmetic that is also a drug is to see if the first ingredient listed is an “active ingredient.” The active ingredient is the chemical that makes the product effective. The manufacturer must have proof that it’s safe for its intended use. Cosmetics can cause allergic reactions. The first sign is often red and irritated skin. Fragrances and preservatives are the most common causes of skin problems. To find out all the ingredients in a cosmetic used, check the container. Manufacturers are required to list them. Labels such as “natural” and “hypoallergenic” have no official meaning. Companies can use them to mean whatever they want.

Introduction: Nanotechnology is nothing but the fundamental understanding about how materials react or works at nano scale (i.e. at atomic, molecular or subatomic level) in the creation and utilization of structures, devices and systems that have novel properties and functions. Nanotechnology deals with manipulation of structures of matter in the size range of 1-100 nanometers. Particles of these size ranges are called as nanoparticles which are having one or more external dimensions or an internal structure, on the nanoscale and could exhibit novel characteristics compared to the same material without nanoscale features.

Advantages:

- ❖ Use of nanotechnology in cosmetics is aimed to make fragrances last longer, sunscreens more effective and anti-ageing creams.
- ❖ To optimize manufacturing conditions for skin care formulation, a multi component system.
- ❖ To prevent hair from turning grey and also for

prevention of in treatment of hair loss and used to preserve active ingredients, such as vitamins and anti-oxidants, and their lightness and transparency.

❖ To improve the UV protection in combination with organic sunscreens such as 2- hydroxy-4-methoxy benzophenone this allows a reduction of the concentration of the UV absorber.

❖ Nano materials used as UV filters in sunscreen products do have to be independently assessed, but we found nano zinc oxide in use, although it has not yet been fully assessed.

Disadvantages:

❖ Smaller particles have a greater reactivity, are more chemically reactive and produce greater numbers of reactive oxygen species.

❖ It may result in oxidative stress, inflammation, and consequent damage to proteins, membranes and DNA.

❖ Nanomaterial has proved toxic to human tissue and cell cultures, resulting in increased oxidative stress and cell death.

❖ Photo-activated Nanoparticles titanium dioxide has been demonstrated to cause oxidative damage to DNA in cultured human fibroblasts.

❖ Photo-activated titanium dioxide nanoparticles were toxic to skin fibroblasts and nucleic acids and to human colon carcinoma cells.

❖ Inhaled ultrafine particles induce pulmonary inflammation when the particles are quartz, minerals, dust, coal, silicate, and asbestos. These can induce pulmonary fibrosis, cytotoxicity, and even malignancy.

Applications of nanoparticles in cosmetics:-

1. Sunscreens:- UV filters, such as titanium dioxide and zinc oxide, are used in nano form rather than bulk form to make the sunscreen transparent rather than white. It is also claimed that they are more effective when used in nano form.

2. Breast cream:- St Herb Nano Breast Cream claims it is a combination of “nanotechnology and the timeless Thai herb, Pereira Mirifica” and that niosomes

“expands the cellular substructure and development of the lobules and alveoli of the breasts”, with increased size from one to three cups.

3. Hair care:- RBC Life Science’s Nanoceuticals Citrus Mint Shampoo and Conditioner are made with Nano Clusters TM, “nanoclusters to give your hair a healthy shine”.

4. Make-up:- Serge Lutens Blusher’s Nano Dispersion technology “creates an extremely fine and light powder with extraordinary properties: excellent elasticity, extreme softness and light diffusion”

5. Moisturizers/anti-wrinkle creams:- Lancôme Hydra Zen Cream with “nano- encapsulated Triceramide renew skin’s healthy look”; L’Oreal Revitalift Double Lifting anti-wrinkle cream is their “first double-action cream that instantly re-tautens the skin and reduces the appearance of wrinkles”, and contains Nanosomes of Pro-Retinol A.

6. Toothpaste:- Sangi’s Apagard claims to be the world’s first ‘remineralizing’ toothpaste, promoting oral health by supporting natural healing, using “Nanoparticles hydroxyapatite”, “the same substance as our teeth”; Ace Silver Plus Nano silver toothpaste is manufactured and available in Korea.

7. Fullerenes:- New types of materials can be produced using nanotechnology, such as carbon fullerenes. It is claimed that these tiny carbon spheres have anti-aging properties.

Possible Complications of cosmetics:



1. Foundation: Foundation is a good place to start, as many women cover their whole face and neck with it daily. Liquid foundations contain many harmful chemicals, including the following, found in a major drugstore brand: propylene glycol, methylparaben, and propylparaben, all of which are considered endocrine disruptors. These are important to avoid because the endocrine system regulates ALL biological processes in the body, including development of the brain and nervous system, growth and function of the reproductive system, and metabolism and blood sugar regulation, as well as the functions of the ovaries, testes, pituitary, thyroid, and adrenal glands. The World Health Organization (WHO) and the UN recently released a report calling endocrine disruptors a “global threat” to fertility and the environment. In 2011, another shocking study showed that methylparaben along with an endocrine disruptor widely found in food, BPA, turned healthy cells into cancer cells and rendered the breast cancer drug tamoxifen ineffective.

The same brand also contains ingredients that have the potential to be contaminated with cancer causers: PEG/PPG 10 dimethicone, PEG/PPG 18, retinyl acetate, tocophery l acetate, laureth 7, PEG/PPG 20 dimethicone.

Loose powders and brush-on foundations, which are applied topically, not only have the endocrine disruptors methylparaben, propylparaben, but have other ingredients of concern, too. One best seller (and many similar products) contains retinyl acetate, alumina (suspected of being neurotoxic), and other hazardous ingredients that can be inhaled.

Look for products without these ingredients. Our Ava FACE foundation, formulated with French clay, silk, and organic arrowroot powder is one such product.

2. Lipstick: According to a recent piece by The New York Times, “Millions of women and girls apply

lipstick every day. And not just once: some style-conscious users touch up their color more than 20 times a day.” A recent study also found that “a wide range of brands contain as many as eight other metals, from cadmium to aluminum.” Those will never appear on a label because they are contaminants of other ingredients. Besides endocrine disruptors like propylparaben, other harmful substances in typical department store and drugstore lipsticks are as tocopheryl acetate and retinyl acetate, as well as titanium dioxide, which usually exists in nanoparticle form. Nanoparticles have been shown to cross the cell barrier and drive into organs, including the brain in humans, where they can cause long-term oxidative damage. There is no way of knowing what size particles are in the product unless the manufacturer.

3. Mascara: With toxic ingredients like these from a best-selling major brand of mascara, it is important to find an organic alternative that still delivers results: triethanolamine (which reacts with other ingredients in products to become carcinogenic nitrosodiethanolamine), propylene glycol, methylparaben, butylparaben, quaternium 15 and quaternium 22 (both of which release cancerous formaldehyde as they break down), and synthetic colorants that have been linked to organ-system toxicity.

The Dirty Dozen

BHA and BHT: Used mainly in moisturizers and makeup as preservatives. Suspected endocrine disruptors and may cause cancer (BHA). Harmful to fish and other wildlife.

1. **Coal tar dyes:** p-phenylenediamine and colours listed as “CI” followed by five digits.

P-phenylenediamine is used in some hair dyes; other colours are used in a variety of cosmetics. Potential to cause cancer and may be contaminated with heavy metals toxic to the brain.

2. **DEA-related ingredients:** Used in some creamy

and foaming products, such as moisturizers and shampoos. Can react to form nitrosamines, which may cause cancer. Harmful to fish and other wildlife.

3. **Dibutyl phthalate:** Used as a plasticizer in some nail care products. Suspected endocrine disrupter and reproductive toxicant. Harmful to fish and other wildlife.

4. **Formaldehyde-releasing preservatives:** Used in a variety of cosmetics. Slowly release small amounts of formaldehyde, which causes cancer.

5. **Paraben, methylparaben, butylparaben and propylparaben:** Used in a variety of cosmetics as preservatives. Suspected endocrine disrupters and may interfere with male reproductive functions.

6. **Parfum:** Any mixture of fragrance ingredients used in a variety of cosmetics. Some fragrance ingredients can trigger allergies and asthma. Some linked to cancer and neurotoxicity. Some harmful to fish and other wildlife.

7. **PEGs (e.g., PEG -60):** Used in some cosmetic cream bases. Can be contaminated with 1,4-dioxane, which may cause cancer.

8. **Petrolatum:** Used in some hair products for shine and as a moisture barrier in some lip balms, lip sticks and moisturizers. Can be contaminated with polycyclic aromatic hydrocarbons, which may cause cancer.

9. **Siloxanes:** Used in a variety of cosmetics to soften, smooth and moisten. Suspected endocrine disrupter and reproductive toxicant (cyclotetrasiloxane). Harmful to fish and other wildlife.

10. **Sodium laureth sulfate:** Used in some foaming cosmetics, such as shampoos, cleansers and bubble bath. Can be contaminated with 1,4-dioxane, which may cause cancer.

11. **Triclosan:** Used in some antibacterial cosmetics, such as toothpastes, cleansers and deodorants. Suspected endocrine disrupter and may contribute to antibiotic resistance in bacteria. Harmful to fish and

other wildlife.

Conclusion: Since there is lot of complications for many cosmetic products; nanotechnology is a rapidly expanding and helpful field with tremendous implications for Society, Industry, Medicine, and Cosmeceuticals. Nanomaterial has been incorporated into a number of skin care products to take advantage of the unique properties of matter on a nanoscale. It is critical for dermatologists intimately involved with the health of the skin to be aware of this new technology, to educate our own colleagues about it, and to play an active role in evaluating this technology and setting policies and guidelines for its safe and fruitful use.

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