



Nail beauty products

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Introduction:

Nails, have over the years become an accessory for beautification. Within the past few decades, products for cosmetic care of nails have grown on the market. From nail hardeners to nail polish to artificial nails.

Cosmetic Nail Products:

The most studied products include:
nail polish, artificial nails, and nail polish remover.

1. Nail Polish

Nail polish is one of the primary forms of nail beautification. nail polish has three main types :

a–The first is the basecoat, which help to create a smooth and uniform layer upon which the pigmented nail polish may be applied.

b–The second is the pigmented nail polish, itself.

c–The third is the aftercoat, which is applied on top of the pigmented nail polish to provide fortification against chipping as well as an added sheen.

Nail polish often contains the following components:

- a film former: is often composed of nitrocellulose.
- a plasticizer: is often dibutyl phthalate, serves to enhance adhesion and provides flexibility
- a thermoplastic resin: often toluene sulfonamide-formaldehyde, improves adhesion, hardening, and gloss.
- a solvent-extender: it allow the components of the nail varnish to remain in a liquid form eg. ethyl acetate, isopropyl alcohol, butyl acetate, or toluene.
- Pigment component may be highly variable and may include elements such as iron oxides, color lakes. The pigment may be organic or inorganic, although inorganic compounds must have low heavy-metal content
- a suspending agent.

Adverse effects:

1-yellow-orange discoloration of the superficial nail due to dyes in the nail polish.



2-keratin degranulation of nails:

may occur in the process of repeated application, binding, and removal of nail polish from the nail plate.



3-allergic contact dermatitis (ACD) due to the different components of the nail polish.



4- an increased bacterial spread in nails, which should be taken into account in healthcare and sterile settings.



2. Artificial Nails:

Artificial nails are often used to extend the length of a the original nail . Many types of artificial nails are found.

1- plastic nails: may be glued to the existing nail, either in a salon or at home with a kit. They may be removed with nail polish remover or nail glue remover.

2-acrylic nails :Acrylic nails use a combination of a powdered polymer and a monomer liquid which are mixed upon the nail plate and then allowed to polymerize and harden. Natural light and an organic accelerator such as benzoyl peroxide may help facilitate this reaction. In the process of hardening, these nails may be sculptured into the desired length or shape.

The monomer used in this reaction is usually a methacrylate monomer. The powdered polymer is usually poly methyl methacrylate.



3- uv gel nails:

Gel nails are a newer fashion trend whereby the gel nail varnish is applied like normal nail polish, but then is allowed to polymerize through photobonding under a light source, usually ultraviolet (UV). Gel nails may require the application of several layers of colored or glossy layers, each layer needing to be polymerized under the UV light. The lights used for nail curing now come in two varieties: UV lamps and light-emitting diode (LED) lamps.



LED lamp



UV lamp

Gel nails may be obtained at a nail salon, but home kits are also available. Similar to a gel manicure at a salon, the consumer files and primes the nails. They then apply the gel coat and place their hands under the light to cure the polish. Gel nails, similar to acrylic nails, contain substances such as ethyl cyanoacrylate and polymethyl methacrylate monomers.



Adverse effects of artificial nails:

- 1-allergic contact dermatitis, particularly to methacrylate monomers.
- 2-Many cases of localized paronychia, nail dystrophy, onycholysis, pruritic eczema, and fissuring along the hands have been reported.



paronychia



nail dystrophy



onycholysis



pruritic eczema

3- The face, and particularly the eyelids, are commonly subjected to allergy. A case of cheilitis and lip edema due to contact with UV gel nails was reported.

4- Some cases of morbidity in nail salon workers due to allergy to acrylates .

5- Worsening of pre-existing asthma, new-onset asthma, and rhinitis in nail technicians has also been observed.

6- the exposure of the hands to UV light in the process of photobonding may be associated with increased risk of skin cancer.

7-distal nail plate thinning .



8-The glue also diminished the amount of silicon and aluminum in the nail, decreasing the brightness and hardness of the nail.

9-Another concern with artificial nails is their potential flammability.

10-increasing the risk of bacterial transfer .

3- Nail Polish remover and Nail Glue Remover:

Nail polish remover is often an organic solvent with added scents and colors. The classic and most recognized remover is acetone. More recently, acetone-free liquids have been commercialized which largely consist of **gamma-butyrolactone (GBL)**. **Ethyl acetate** may be another organic solvent used for removal of nail polish.

Nail polish removers may come in different presentations:

- 1-bottled liquid requiring cotton balls or pads for application.
- 2- pre-submerged pads.
- 3-liquid infused into a foam in which one inserts their finger to clean their nail.



Adverse effects:

- 1-Ingestion of acetone may cause lethargy, confusion, and decreased arousability for several hours, serious health effects and death are unlikely due to acetone.
- 2-Similar but more serious toxicity due to acetone-free nail polish remover has been reported leading to cardiorespiratory collapse and coma due to gamma-butyrolactone these cases improved with time and supportive care.
- 3-Episodes of vomiting, cyanosis, lethargy, and altered mental status have occurred due to substances such as N,N-dimethyl-p-toluidine and nitroethane, which are present as solvents in some nail polish removers. Both these substances give rise to cyanosis and methemoglobinemia, which can be potentially deadly if not treated with IV fluids, oxygen, and methylene blue.
- 4-Many cases have described cyanide poisoning due to the presence of acetonitrile which is the main cause of its morbidity and mortality and also include acidosis, cardiorespiratory instability, and seizures, resolving only with sodium Thiosulfate. Although the patient responded to sodium thiosulfate and sodium nitrite, the patient's condition relapsed several times, needing several doses of sodium thiosulfate and hemodialysis/hemoperfusion.

5-prolonged exposure to acetone due to soaking the nails in acetone or other solvents for 10–15 minutes has been associated with splitting of the nail, white discoloration of the nail, and overall thinning and brittleness of the fingernails





THANK YOU