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Know Your Products & its Chemical Hazards

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INTRODUCTION

- In our life, we regularly come across a lot of chemical substances that have been a inevitable part of our lives.

- Most of these products are meant to make our daily life easier and more convenient to do various tasks but indirectly, these products may be a major source of hazard to the environment, plants, animals and humans

- Thus we need to be extremely careful while using such products that may contain chemical substances and abrasives as they mostly have direct physical, medical consequences and indirect environmental hazards.

- Here, I have listed 10 major products that we often come across and come under frequent use in our lives along with their chemical compositions, possible hazards, methods to ensure safety and some rules and regulations regarding them.

1.Plastics

Plastic is a a synthetic material made from a wide range of organic polymers such as polyethylene, PVC, nylon, etc., that can be molded into shape while soft, and then set into a rigid or slightly elastic form.

➢**Uses:**

•Food Storage utensils, bottles, packaging, carrrybag,etc
•Furniture and lightweight materials
•Pipes, fittings and fixtures

➢**Chemical Components:**

•Polyvinyl Chloride(PVC)
•Polyurethane(PUR)
•Lead(Pb), Cadmium(Cd) and other toxic elements

➢**Chemical Hazard for the health and the environment:**

•Toxicities may enter our body through food, water, air.
•Chemical additives in plastic are found to cause hormone-related cancers, infertility and neurodevelopment disorders like ADHD and autism.
•In the environment, these plastics and microplastics attract micro-organisms and bacteria(pathogens) which may increase the risk of infection.

2.Detergent

A detergent is a surfactant or a mixture of surfactants with cleansing properties in dilute solutions. These substances are usually alkylbenzene sulfonates, a family of compounds that are similar to soap but are more soluble in hard water, because the polar sulfonate (of detergents) is less likely than the polar carboxylate (of soap) to bind to calcium and other ions found in hard water.

❖USES:

- Washing Clothes or dishes.
- Cleaning Tiles, floors, corridors, tubs, etc.
- To prevent the moss formation on sidewalk or driveway.

❖Chemical Components:

- 1,4-dioxane
- Sodium Laureth Suphate(SLS)
- Bleach, Formaldehyde
- Nonylphenol Ethoxylate.

❖Chemical Hazard for the health and the environment:

- Being non biodegradable, it pollutes the environment
- It contaminates the water resources and make w unhealthy.
- It can cause eye irritation, breathing or stor problems or even coma and death when inhaled improperly handled.

3.Petroleum Products

Petroleum products are materials derived from crude oil (petroleum) as it is processed in oil refineries. The most commonly used petroleum products include diesel, petrol, mobil, kerosene, Liquefied, petroleum gas etc. They are very important products in our daily life. In spite of their extreme usefulness, they carry along a lot of hazards as well.

Uses:

- As fuel in household, industries, airplanes, automobiles
- As a source of electricity generation in power plants.
- To manufacture asphalt, paraffin wax, tar, lubricating oil,etc.

❖**Chemical Components:**

- Hydrocarbons
- Traces of Sulphur & heavy metals like Va, Co, Ni, etc.
- Toluene,
- Xylenes,
- Naphthalene
- Fluorene

❖**Chemical Hazard for the health and the environment:**

- Ingestion in human body can lead to metabolic malfunction.
- Can cause the death of wild animals when mistakely inhaled.
- Can cause screen rashes, irritation and illness

4. Insecticides&Pesticides

Insecticides are substances used to kill insects such as fly, mosquitos, cockroach etc. They include ovicides and larvicides used against insect eggs and larvae, respectively. Insecticides are used in home, agriculture, medicine, industry and by consumers.

Uses:

- They kill or control harmful insect or pets.
- They help to increase food production..
- They help to control cerebral diseases by killing germs.

❖**Chemical Components:**

- 2,4-Dichlorophenoxyacetic Acid (2,4-D).
- Aldrin/Dieldrin, Atrazine.
- Chlordane., Endosulfan.
- Chlordecone.
- DDT, DDE, DDD.
- Endrin (Endrin aldehyde).

❖**Chemical Hazard for the health and the environment:**

- Insecticide kill not only harmful insect that also some useful insect.
- They are mostly synthetic and non biodegradable.
- They can leave a harmful deposit in fruits and crops while using in them.

5.Cosmetic Products

Cosmetics are a category of health and beauty products that are used to care for the face and body, or used to accentuate or change a person's appearance. cosmetics can also refer to a number of products used to care for the skin and the body, as well as those used to add fragrance to it.

Uses:

- To exfoliate and protect the skin, as well as replenishing it.
- To cleanse the body.

❖**Chemical Components:**

- Formaldehyde,
- Paraformaldehyde
- Methylene glycol
- Quaternium 15
- Mercury
- Diethylhexyl phthalates.

❖**Chemical Hazard for the health and the environment:**

- It caused eye infections, spreading bacteria on the skin, irritation and scratches on the eye.
- It contains allergic reactions or sensitivity to ingredients.
- Fire hazards, in the case of aerosol products such as hairspray.

6.Toothpaste

Toothpaste is a paste or gel dentifrice used with a toothbrush to clean and maintain the aesthetics and health of teeth. Toothpaste is used to promote oral hygiene: it is an abrasive that aids in removing dental plaque and food from the teeth, assists in suppressing halitosis, and delivers active ingredients to help prevent tooth decay and gum disease. Salt and baking soda are among materials that can be substituted for commercial toothpaste. Large amounts of swallowed toothpaste can be toxic.

Uses:

•It is use to maintain dental health and preventing dental disease like cavities.

•It also helps control and remove plaque buildup.

•It also helps in preventing and destroying the germ buildup in teeth and maintaining gum health.

❖**Chemical Components:**

Abrasives

•Sodium Fluoride mixture with triclosan

•Fluorides

•Detergent

❖**Chemical Hazard for the health and the environment:**

•Children who swallow too much fluoride toothpaste can suffer acute poisoning, even death.

•Excess swallow can cause gastric pain, nausea, vomiting, headache, dizziness, and flu-like symptoms.

7.Mosquito Coil

Mosquito coil is a mosquito-repelling incense, usually made into a spiral, and typically made using dried paste of pyrethrum powder. The coil is usually held at the center of the spiral, suspending it in the air, or wedged by two pieces of fireproof netting to allow continuous smoldering. Burning usually begins at the outer end of the spiral and progresses slowly toward the center of the spiral, producing a mosquito-repellent smoke.

Uses:

- To repel away mosquito

❖**Harmful Chemical Components:**

- Pyrethroid insecticides
- Citronella

❖**Chemical Hazard for the health and the environment:**

- The particulate matter produced from a smoldering mosquito coil that poses the greatest risk.
- A study estimated the particulate matter produced from burning one mosquito coil was equivalent to burning about 100 cigarettes.

8.Vicks VapoRub

Vicks VapoRub is a mentholated topical ointment, part of the Vicks brand. VapoRub is intended for use on the chest, back and throat for cough suppression or on muscles and joints for minor aches and pains. It has also been used to treat mosquito bites. Users of VapoRub often apply it immediately before sleep.

Uses:
- To treat minor aches and pains.
- To treat mosquito bites
- To suppress cough

❖**Chemical Components:**
- Camphor
- Thymol
- Menthol

❖**Chemical Hazard for the health and the environment:**
- Camphor causes Skin redness and irritation.
- burning of the mouth and throat, nausea, and vomiting.
- Stinging Sensation on the skin, dry skin , skin irritation.
- Hypersensitivity reactions, tingling sensation of skin.

9. Soap

Soap is a salt of a fatty acid. Used in a variety of cleansing and lubricating products as well as surfactants. It has chemical properties which kills microorganisms by disorganizing their membrane lipid layer and denaturing their proteins. It also emulsifies oils, enabling them to be easily carried away by water. It is created by mixing fats and oils with a base. Soaps has been used by humans for millennia.

Uses:

- Used for bathing and washing hands.
- Used for washing clothes, utensils , etc.

❖**Harmful Chemical Components:**

- Cocamidopropyl Betaine
- Methylisothiazolinone

❖**Chemical Hazard for the health and the environment:**

- :Signs of an allergic reaction, like rash; hives; itching; red, swollen, blistered, or peeling skin.
- Wheezing and tightness in the chest or throat; trouble breathing, swallowing, or talking
- Remains of the soap when present in the water bodies hamper the aquatic life and marine ecosystem.
- Antifungal additives like Triclosan has adverse effects on the mitochondria of our cells.

10.Paints and Decoratives

Paint is a pigmented liquid, liquifiable or solid mastic decomposition that subtrate into a thin layer and eventually converts into a solid film. It is available in many forms, colors and types. Paints are usually either oil based or water based.

Uses:

- To protect any substance from corrosion due to contact with the atmosphere.
- To decorate something and make it look beautiful.
- To smoothen the surface of a rough object.

❖**Chemical Components:**

- Titanium dioxide (titanium(IV) oxide)
- Heavy metals like Zinc, Cadmium, Mercury, Cobalt, Lead, etc.
- Pigments, binders and other additives
- 2-butoxyethanol

❖**Chemical Hazard for the health and the environment:**

- Volatile organic compounds (VOCs) in paint are considered harmful to the environment.
- Enamel paint contains potentially harmful solvents like toluene, xylene, white spirit, acetone and ethyl acetate.

Safety Instructions:

•Carefully read the ingredient list of any product or chemical you use. The label can also tell you how to use the proper protective equipment, how to handle the chemicals, and how to respond to emergencies. The label will tell you if the substance is flammable, corrosive, or may cause cancer.
•It will also state whether you should use eye protection, gloves, or other equipment.
•Purchase the proper personal protective equipment like gloves or goggles. Clean and care for them properly.
•Be aware of the hazardous materials you come in contact with. Learn about the specific characteristics and dangers.
•Follow safe procedures when you handle hazardous material. Don't take shortcuts.
•Don't mix or combine hazardous materials unless you know you can do so safely. Many products can cause violent reactions or release poisonous fumes when combined.
•Transferring flammable liquids like gasoline, from one container to another can make static electricity that could ignite the fumes.
•Always wash your hands after using any unsafe material.

Rules And Regulations

Following are some of the rules and regulations set in the national and the international level to ensure the safety of the consumers:

❑National:

Food Act 1967 and Food Regulation 1970

Pesticide Rules and Regulations in 1993

❑International:

Minima Convention on mercury

International Code of Conduct on the Distribution and Use of Pesticides

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Stockholm Convention on Persistent Organic Pollutants

❑CONCLUSION:

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Chemical substances are the inevitable part of our daily life. We regularly use many chemical substances in our day to day activities which are close to impossible to be abandoned. Chemistry and chemical substances come along in different basic activities like food, breathing, cleaning&washing and literally on the every other step of our life, we encounter these things. Here we had a look at the few prominent most common used examples of daily products and the chemical hazards caused by the chemical composition present in them.

Thus we have to be very careful while using such hazardous products and make the minimal use of such products if possible.

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Thank You Very Much. Your kind suggestions would be highly appreciated