



ENVIRONMENTAL BIOTECHNOLOGY

Topic: Hazardous Waste Management

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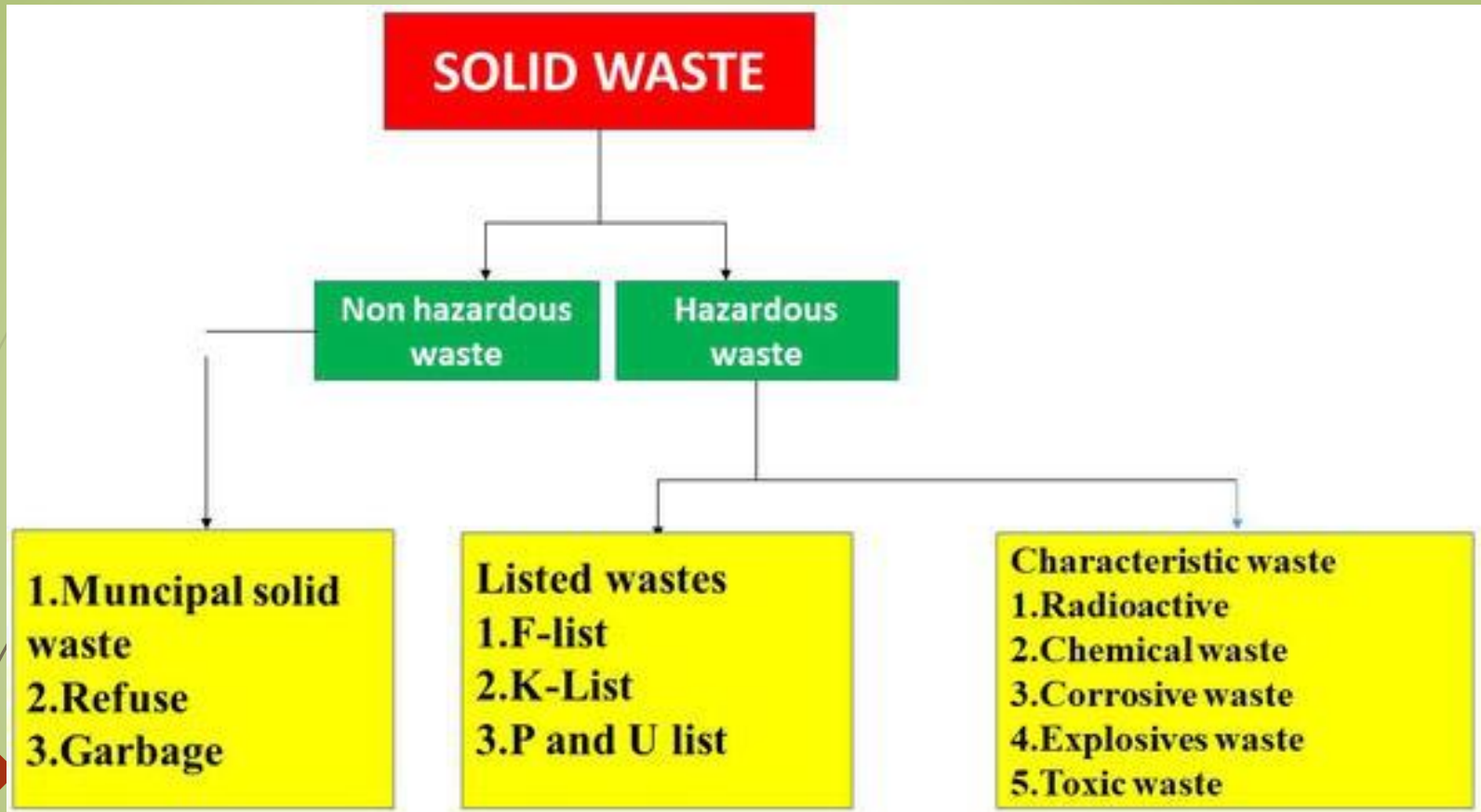
DEPARTMENT OF LIFE SCIENCES AND BIOTECHNOLOGY



What is Hazardous Waste?

The primary purpose for a hazardous waste definition is to help the stakeholders establish whether waste is hazardous or potentially hazardous. As per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016: “Hazardous waste” means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other waste or substances and shall include:

- i. Wastes specified in column (3) of Schedule-I;
- ii. Wastes having equal to or more than the concentration limits specified for the constituents in Class A and Class B of Schedule-II or any of the characteristics as specified in Class C of Schedule II;
- and iii. Wastes specified in Part-A of Schedule-III in respect of import or export of such wastes or the wastes not specified in Part A but exhibits hazardous characteristics specified in Part-C of Schedule-III



Classification of hazardous wastes

According to EPA more than 450 listed wastes which are known to be hazardous are grouped as F-List, K-List, P-List and U-List



F-list

The F-list contains hazardous wastes originated from a nonspecific source that includes various industrial processes leading to generation of these wastes.

The list mainly includes the solvent used in degreasing, metal treatment baths and sludge's, wastewaters from metal plating operations and dioxin containing chemicals or their precursors.

They can be divided into seven groups depending on the type of manufacturing or industrial operation generating the waste.

F-list

- Metal finishing wastes
- Dioxin-contaminated wastes
- Chlorinated aliphatic hydrocarbons production
- Wood preserving wastes
- Waste from petroleum refinery
- Multisource leachate/vent wastes



K-list

The K-list contains hazardous wastes generated as a result of specific industrial processes and are considered as source-specific wastes. The classification of K-listed hazardous waste must fit into one of the 13 categories mentioned below

- Wood preservation
- Organic chemicals manufacturing
- Pesticides manufacturing
- Petroleum refining
- Veterinary pharmaceuticals manufacturing
- Inorganic pigment manufacturing
- Inorganic chemicals manufacturing
- Explosives manufacturing
- Iron and steel production
- Primary aluminum production
- Secondary lead processing
- Ink formulation
- Coking (processing of coal to produce coke)

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P and U lists

The unused chemicals of pure and commercial formulations that are being disposed come under P and U lists. For a P- or U-listed waste it requires the following three criteria:

- The waste must contain one of the chemicals listed on the P or U list
- The chemical in the waste must be unused
- The chemical in the waste must be in the form of a commercial chemical product.

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- **Ignitability:-**

- can create fire under certain condition
- flashpoint 60°C

eg:- waste /ents



- **Reactivity:-**

- substance that are unstable under normal condition.
- can cause explosion, produce toxic fumes, vapours
- pH b/w 2 and 11.5
- eg:- cyanide/sulphide, batteries etc



- **Corrosivity:-**

- acids or bases
- pH ≤ 2 or ≥ 12.5
- if liquid it will corrode steel



- **Toxicity:-**

- harmful when ingested/absorbed
- leach from waste and pollute ground water
- eg:- lead, mercury etc



Figure – 2.0: Sample symbolic representation showing of selected Characteristics of Hazardous Wastes.





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