

ABHISHEK. K  
ICR18CV004

→ SWM ←  
IAT-2

### ① Advantages of incineration:-

- Incineration is the hygienic way of disposing solid waste
- It is more suitable if waste contains more hazardous material and organic content.
- It is a thermal process and very effective
- Reduces trash volume
- Transportation cost is low.
- requires less space

### (2) Disadvantages:

- Needs skilled person,
- It is an expensive technology compared to land fill
- produces lot of toxic ash
- Toxic dioxins are emitted in this process therefore causes air pollution
- ~~is~~ lot of health ~~is~~ effects eg (thyroid disorder)

2) Two types of incinerations .

→ Rotary kiln Incinerator:-

(1) Solid waste as well as liquid waste which are generated by all industries are destroyed at site and at commercial site rotary kiln will manage the waste.

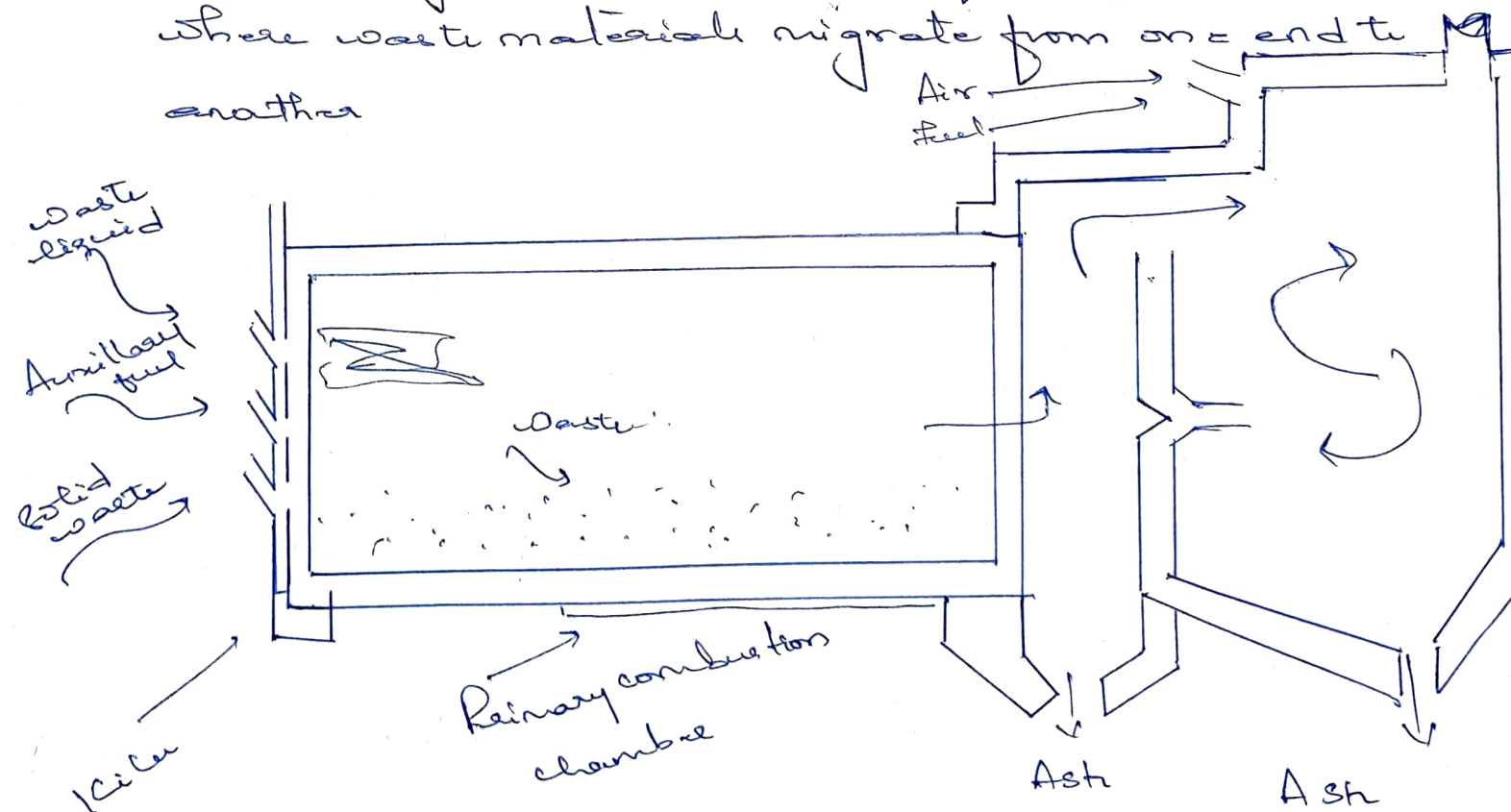
(2) Rotary kiln is a cylindrical shell that rotates to provide tumbling and lifting action to the waste material.

(3) This machine consist of two parts

1 → primary chamber.

2 → secondary chamber.

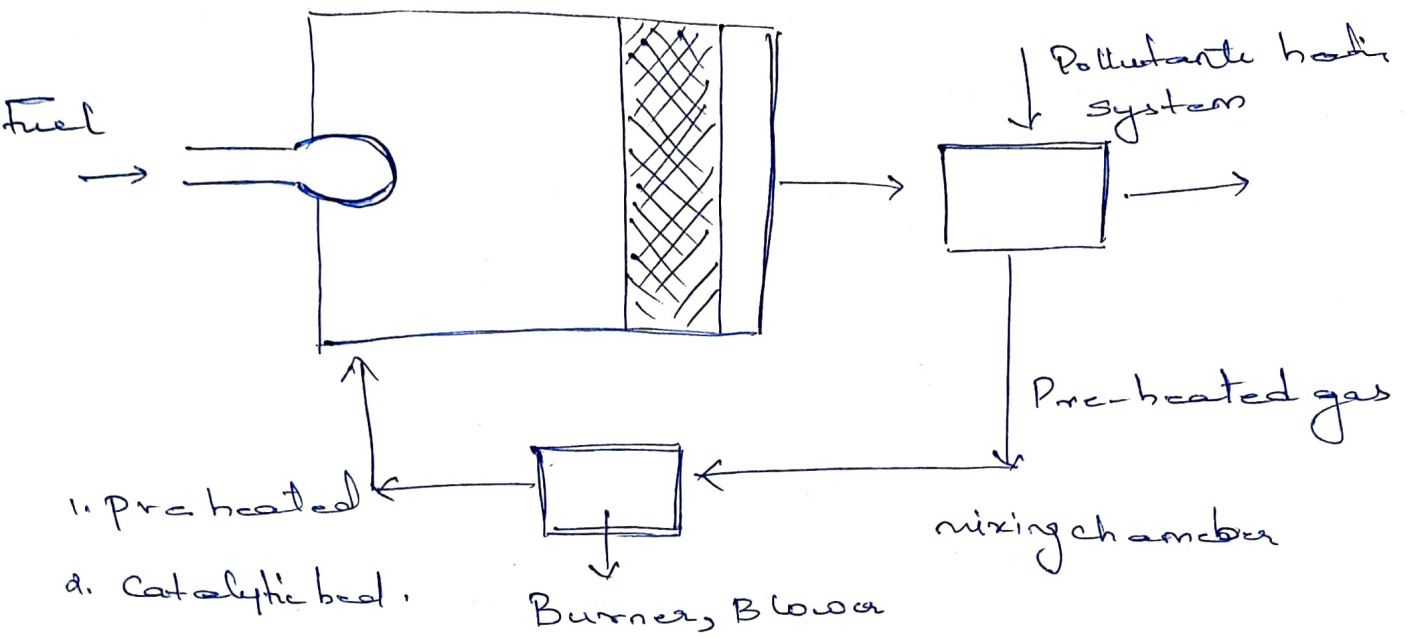
(4) The primary chamber consist of slightly inclined where waste material migrate from one end to another



- Here openings are provided to input solid and liquid waste, fuel air for burning of waste. Temperature here varies from 1,300 to 2400°.
- The unburnt volatiles the secondary chamber along with the hot product of combustion where add. oxy. is introduced.
- Ashes from primary and secondary chamber is discharged out. The temp. of the ash discharged by the kiln is lower. This creates less issue with slagging and it's therefore more available.

### (0) Catalytic Incinerators:-

- Catalytic Incinerator is an oxidation process which oxidises organic compounds by the usage of catalyst.
- These incinerators are used to destroy gaseous pollutants in volatile organic compounds catalyst used.
- This incinerators:-
  - ① A pre-heater section.
  - ② A burner.
  - ③ A mixing chamber.
  - ④ A catalyst bed.
  - ⑤ A blower.



→ The catalytic bed is arranged in such a fashion that the influent stream admixed with hot flue gas has to pass the bed. It should be so fitted to the combustion chamber for reactivating or replacement.

→ most of the volatile organic compounds on complete combustion to produce  $\text{CO}_2$  &  $\text{H}_2\text{O}$

3. Hazardous waste:-

These are waste that are very dangerous for ecosystem and human beings.

- \* These are non degradable
- \* Are highly toxic and lethal

Characteristic of Hazardous waste:-

(\*) Ignitability :- A waste that is ignitable if flash point of that is less than 60°C readily catches fire.

(\*) Reactivity :- A waste is considered a reactive hazardous waste if it is unstable reacts ~~to~~ violently with water, generates toxic gases.

(\*) Toxicity :- After conduction of various toxicity test one can identify a waste material as toxic.

(\*) Corrosivity :- Leaks of iron metal are thrown away. Vigorously these when reacted with water oxidises and becomes corrosive in nature which can affect ecosystem.

#### 4. Design criteria for incineration :-

(\*) ~~Incineration~~ Incineration is mainly used for e-waste segregation and disposal. This should happen very carefully.

Few criteria are :-

→ It should happen under controlled temperature

→ Near the incineration machine or that radiations there should not be any houses or living hood.

- There should be a single chamber with a tubular
- Excess air supply in the primary chamber
- One load per cycle should only be allowed.
- Forced air blowers should be present.
- Separate small ash doors should be present.
- The equipment should have a long life.
- Should be able to handle 4 types of waste with 85% moisture content.

### o Different types of incinerators:

- Fluidized bed :- usually used for glass and metals.
- Rotary kiln :- for solid waste from industry.
- Liquid Injection :- used at chemical industry for organic toxins.
- Catalytic :- usage of catalyst for the incineration process

→

~~biodegradable~~  
manure

6. Vermicomposting :- is a process of composting process of decomposing of biodegradable organic matter by soil bacteria.

## Factors affecting :-

- (1) Temperature :- As temp. varies it will affect the waste
- (2) organism in composting :- different organism have diff proper
- (3) fly control :- It is a huge attraction for fly.
- (4) climatic condition :- during rainy seasons the outcome. night change.
- (5) Aeration :- avoids anaerobic condition
- (6) curdling and shredding :- shredding will be a problem.
- (7) Reaction :- & Various Pre level material can cause reaction
- (8) moisture content :- high moisture content must be avoided because water displace air and availability of oxygen.