Biomedical Waste Management

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ABSTRACT-Manage and disposal of wastes are done in a vast era, Because of the hazardous effects produced by it. Particularly, medical waste causes more dangerous infections and hazards. The diagnosis, treatment of humans and animals results in accumulation of tonnes of Bio Medical waste. As per the annual reports in India, approximately 500 tonnes of medical wastes are generated. Among them about 470 to 486 tonnes of wastes are treated and disposed. Methods like Incineration, Autoclave, Land filling and Chemical treatment. As per the 2016 rules, proper steps are followed to treat the wastes. Here a complete detail is given about how Bio Medical Wastes are treated and disposed in the medical waste management plants. Also this paper suggests some alternate ideas in order to overcome the back laws in the procedures like incineration, Laboratory techniques, testing the composition of the sample wastes.

Keywords: Bio medical wastes, Hazardous effects, Incineration, Autoclave, Land filling, Chemical treatment.

I. INTRODUCTION

Biomedical wastes are composed of solid, fluid and liquid wastes which are generated during diagnostics, observational and therapeutic for the patients treatment or ailing in the hospital. According to this, 85% of biomedical wastes are non-hazardous, 10% are infectious and 5% are non- infectious but hazardous.

These wastes are segregated as per the CPCB (Central Pollution Control board) rules. There is a lack of awareness among the people about the biomedical wastes.

Biomedical waste (management and handling) rules were passed by the government on July 1998. This rules states that 10 category, 5 schedules without any format for annual report.

The rules are again reframed in March 2016 states the 4 categories, 4 schedules and format applied with rules. In accordance with the rules, it has 4 colours (Yellow, Red, White and blue), which is made easy to segregate the waste when compare to the 1996 & 1998 rules.

II. SEGREGATION PROCESS

Wastes are segregated according to the colour codes.

The wastes involved in Yellow colour bags are, Human Tissues, Body Parts, Placenta, Cotton & Bandages, Fetus (Within 12 weeks of Pregnancy), Discarded Medicines(Without pressurised container), Menstrual Cloths and Ear Buds.

Red colour bags contain, Plastics, Tubings, Catheters, IV Sets, Syringes (Without Needles), Gloves and Needle caps.

White colour bags contain Needles, Scalpels, Slides, Nails, and Surgical Blades Etc.

Blue colour bags contains wastes that can be recycled like, Glassware Broken, Discarded & Contaminated Glass, Including Medicine Vials, Ampules and Metallic Body Implants.

III. PROCESS INVOLVED

3.1 INCINERATION

The wastes are completely burnt in a closed chamber at a constant temperature and pressure.

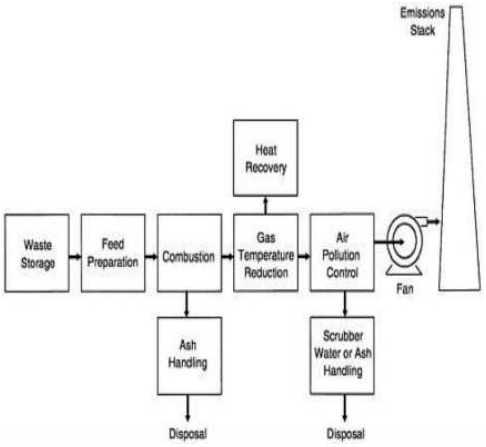

Figure 3.1 Incinerations.

A. Primary chamber

The wastes are fed into the primary chamber. In which the temperature is about 800 to 850 degree Celsius.

B. Secondary chamber

The wastes release many gases of various compositions. They are completely burnt at a temperature of 1200 to 1500 degree Celsius in the secondary chamber and the oxides are filtered by a serious of construction and the gases are exhaled through the chimney.

3.2 AUTOCLAVE

Autoclave is a pressurised chamber which is used for the removal of microbes and disease causing fungus. Autoclave is used for medical applications to perform sterilization at the temperature of 121 degree Celsius, at 15 psi pressure for 60 minutes.

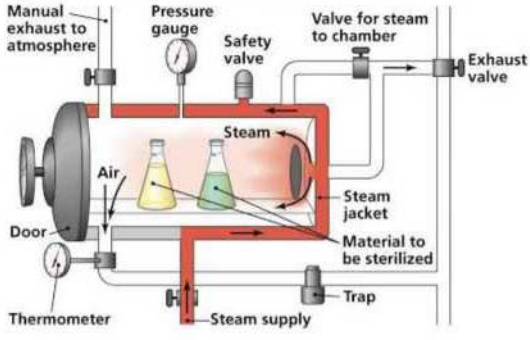

Figure 3.2 Autoclave.

3.3 SHREDDING

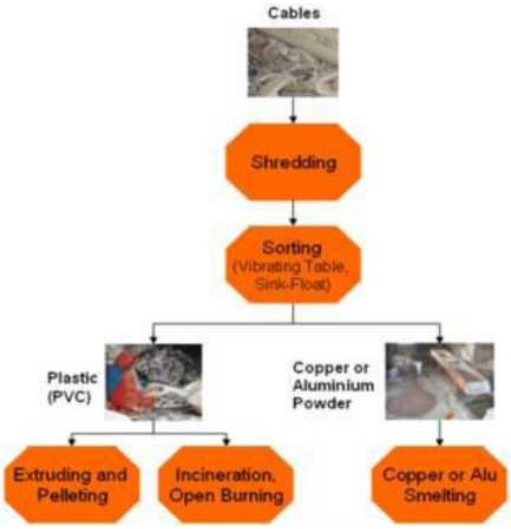

Fig 3.3 Shredding

In this method the glass bottles are cleaned and after sterilisation process, they are shredded into small pieces so that it will be easy to recycle.

4. LANDFILLING

This is the final method in which the hazardous wastes are completely buried under the ground. They are of two types, formal one is filling above the ground and the later one is below ground.

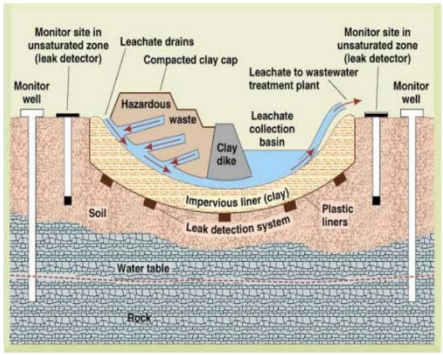

Fig 3.4 Land Filling.

IV. EFFLUENT TREATMENT PLANT

Effluent Treatment Plant is a type of waste water treatment plant which is meant for purifying industrial waste water for reuse and the main aim is to release safe water to the environment from harmful effects caused by the untreated effluent. It should be treated so that the harmful chemical compounds are removed before released into the sewage because industrial effluents contains various materials like oils, grease and toxic substances (cyanide).

This process includes Primary Filtration, Cooling and Mixing, Neutralization (by acid or alkali), Chemical Coagulation, Settling and Separation of Sludge, Pressure Filtration and Discharge. Compounds having long molecular chains cannot easily dissolve in the water. Thus causes imbalance in the nature of the water. If leaved untreated it may result in adverse effects.

V. PROPOSED METHOD

CARBON EMISSION CONTROL AND MONITORING

The incineration of 1 mg medical waste causes the release of 0.7 to 1.2 mg of carbon emission. The range of carbon emission varies among countries. Also other gases like ammonia, nitrous oxide and sulphur dioxide are emitted.

But among these, Carbon causes the greenhouse effect more when compared to other. In order to reduce the emission of carbon, many effluent treatment methods are used.

But, when the effluent treatment system fails there is an absent of warning methods like alarm circuits are light indicators. Therefore installation of alarm indicator circuit reduces the accidental release of carbon in the atmosphere. Thus the collected carbon can be permanently buried in the landfills on which grass layers can be grown for aesthetic purposes.

VI. CONCLUSION

Treatment of medical waste is even though a tedious process, in order to protect the humans and other livings from the health hazards and dangerous infections. Thus we conclude that this survey of Biomedical Waste Management methods needs betterment by the implementation of alarm circuits and carbon emission control and monitoring techniques will reduce and prevents the ‘emission of carbon in the environment.

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