



WASTE UTILISATION FROM BIODEGRADABLE AND NON BIODEGRADABLE RESOURCES

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ABSTRACT:

Wastes are “substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of the law. waste is classified on the basis of their properties .it is mainly classified in to Bio-degradable and non bio-degradable waste .Composting is very common method of utilizing wastes Most advances in the field of composting of wastewater residual is a bio-thermal aerobic process .In this processes the organic portion of the residuals are decomposed. Another upcoming advance in the field of composting is achieved by conversion of organic kitchen wastes into competitive organic fertilizer which is comparable to the manure in terms of its nutrient contents. Drying the biodegradable municipal solid wastes so as to use as animal feed. Production of Biodiesel from waste vegetable oil .combustion, incineration, recycling glass and plastic are some methods of utilisation of non biodegradable waste.

Keywords: bio-degradable, non bio-degradable, composting, manure, incineration, waste

Definition of Wastes

“substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of the law”

Definition of Disposal

“any operation which may lead to resource recovery, recycling, reclamation, direct re-use or alternative uses (Annex IVB of the Basel convention)”Improper waste disposal poses a major threat to the environment and high risks to human health. It is nowadays need to make effort to reuse and recycle all biodegradable and non biodegradable resources.

Classification of Wastes according to their Properties

Bio-degradable waste is one which can be degraded by actions of bacteria, fungi and other living organisms like paper, wood, fruits and others. Most of





these wastes are biodegradable and can be converted into valuable resources that reduce their otherwise negative impacts.

Non-biodegradable is waste which cannot be degraded like plastics, glass, old machines ,cans, containers etc.

WASTE UTILIZATION FROM BIODEGRADABLE RESOURCES

Composting

In composting, pile of organic waste attracts organism present in the environment. Microorganisms consume the nutritional substances and it degrades organic molecules producing carbon dioxide, water and heat. In composting, waste is transformed into a humus-like substance called compost.

The factors responsible for composting are

Aeration as Oxygen is essential for microbes to efficiently break down organic wastes. Composting can happen either aerobically or anaerobically. Anaerobic biodegradation of biodegradable waste produces methane gas which is valuable source of energy. In addition to methane, the by-product is used as slurry that can be used as soil amendment agent which has several vital elements such as nitrogen, phosphorous and potassium for crops growth. Decomposition will occur under anaerobic conditions also, but the process is slow and produces some pretty foul odours. In order to add oxygen to your compost pile, you must turn its contents.

Temperature

A well-mixed compost pile must have the ideal range is between 90 degrees and 140 degrees F. This heat will help destroy undesirable weed seeds and disease which is important for processing and to avoid hazardous effect of unprocessed compost.

Moisture

Compost pile needs moisture to keep the microbial activity high. If there is excessive moisture, it may displace air from the compost pile, allowing the pile to become anaerobic.

In composting practices the aim is to improve microbial activities in composting processes and all the processes is monitored by measuring temperature inside of the composting container and several other chemical





parameters that inform about the microbial activities of microorganisms and the biodegradation carried out by them. The knowledge of microorganisms that is important for composting, the changes they make in organic matter and how composting procedures influence their activities is of utmost importance. In Composting plants, process is optimized in every way to control quality of final compost. This compost is effectively utilised as a source of plant nutrients in intensive small-scale organic-based vegetable production and for sustaining soil health and productivity. All these composting is used at various level from kitchen waste in household at individual level to food waste in hotels and in food industry.

Advances in field of Composting

Most advances in the field of composting of wastewater residual is a bio-thermal aerobic process .In this processes the organic portion of the residuals are decomposed. This composting process reduces the organic material in the residual by approximately 25 percent. During composting processes the heat generated by the decomposition of the organic portion of the residuals reduces the moisture content of the residual, this procedure stabilizes it and renders the residual harmless by transforming it into a usable bio solid.

Another upcoming advance in the field of composting is achieved by conversion of organic kitchen wastes into competitive organic fertilizer which is comparable to the manure in terms of its nutrient contents. This processes is done with the help of earthworm *Lumbricus terrestris* .

There is recent advancement in wastewater sludge composting, composting raw material have high odour released .Various methods can be used to control the odour, but the method favoured is adding quicklime (CaO) to change the pH of the residual changing the pH of the residual, the hydration of the quicklime causes the quicklime to release heat to the residual.

Drying the biodegradable municipal solid wastes so as to use as animal feed

The municipal solid wastes which has high moisture content is dried in drying systems in order to retain maximum nutritional property and





microbiological qualities of the solid waste so that it can be used as animal feed. Small amounts of the waste material were carried out in natural and forced convection ovens at small scale. Large quantity of wastes are dried with help of discontinuous cabinet dryer and a continuous rotary dryer.

Biodegradation of animal waste

The biodegradable outputs of livestock management are valuable organic fertilizers. The organic fertilizer by this contains all kinds of nutrients necessary to feed growing plants like nitrogen, potassium and phosphorus. But we have to process waste that we get from animals as animal manures also contain significant quantities of tapeworm eggs, which are capable of remaining viable for prolonged periods of time, weed seeds, and microorganisms – including that are pathogenic for humans. If we don't process it, it may have hazardous effect and thus processing is required.

Production of Biodiesel from waste vegetable oil

The production of biodiesel from waste vegetable oil offers gives us economically effective, environmental nonhazardous solution and solution that helps in waste management. The new process technologies made it possible to produce biodiesel from recycled frying oils comparable in quality to that of virgin vegetable oil biodiesel. On the positive side it has lower price. Thus, biodiesel produced from recycled frying oils has the same possibilities to be utilized.

Waste utilization from paper industry

The pulp- and paper-industry is responsible for generating large volumes of wastewaters containing compounds from wood or other raw material, process chemicals and compounds formed during processing. The wastewaters from mechanical pulping as well as the condensates from chemical pulping are typically non-toxic to methanogenic degradation and contain easily degradable organic compounds. Thus anaerobic digestion is used for biodegradation. Apart from recycling paper waste from individual level to industrial level one of the advances in paper industry is use of paper waste sludge as a replacement to mineral filler material in various concrete mixes.





WASTE UTILIZATION FROM NON BIODEGRADABLE RESOURCES

Combustion

Non-biodegradable waste can be burned at combustion facilities. Non-biodegradable waste like used rubber tires and plastic are used for burning. As we know that there is constant need of energy, these facilities use the heat generated by incineration to make energy in the form of steam or electricity. This all helps us in decreasing demand for other non-renewable resources, including coal and petroleum. Combustion of municipal waste reduces the amount of trash that ends up in landfills that also decrease soil pollution due to excessive dumping of toxic waste.

Waste utilization of industrial by-product

Aromatic compounds are found in nature and free phenols are liberated as metabolic intermediates at high rate during the degradation of plant materials. The supply of phenolic substances has been increased to the great level due to the release of industrial by-products into the environment. Effluents from petrochemical, textile and coal industries contain phenolic compounds in very high concentration and thus it is necessary to remove phenolic compounds from the environment. Among various techniques available for removal of phenols, biodegradation is an environment friendly and cost effective method.

Waste utilization from glass industry

Glass is 100% recyclable and can be recycled endlessly without loss in quality or purity. Apart from traditional methods of melting and reusing the glass, nowadays water glass are crushed and used as partial replacement for sand in concrete mixes retaining 80 % of its strength. Thus waste glass can be used in construction industry. Apart from this the waste glass produced by cathode ray tube(CRT) when TV and computer monitor are disposed can be recycled .The mortar mixes prepared with CRT glass was similar to that of the control mortar using sand as fine aggregate. The leaching of lead can be prevented by incorporating of CRT glass in cement mortar.





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