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Commentary

Chemical Technologies in Waste Water Management and Recycling Process

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DESCRIPTION

Water, is the utmost importance in our daily lives, hence, the needs to improve and preserve its quality is growing continuously. The main sources for water pollution are from industrial, domestic and agricultural activities and other environmental and global changes. In this view, some attempts have been made to compare for various water treatment and recycling technologies. Some efforts have also been carried out to introduce an approach for water treatment and recycling methods. The comparison of technologies has been presented by discussing their performance, sludge production, life period and operation.

Water pollutants and Waste management

Many pollutants are present in wastewater but toxicity is only observed beyond certain limit called the permissible limit. The type of pollutants that are present in the wastewater depends upon the nature of the industrial, agricultural and municipal wastewater releasing activities. The different types of water pollutants are categorized as inorganic, organic, and biological in nature. The most common water pollutants for inorganic are heavy metals, which are highly toxic and carcinogenic in nature. Additionally, the nitrates, sulphates, phosphates, fluorides, chlorides and oxalates also have some serious of hazardous effects. The organic pollutants of toxic are from pesticides which include insecticides, herbicides, fungicides; Polynuclear Hydrocarbons (PAHs), phenols, polychlorinated biphenyls, halogenated aromatic hydrocarbons, formaldehyde, polybrominated biphenyls, biphenyls, detergents, oils, greases etc.

The reuse and wastewater treatment is an important issue and the scientists are looking for inexpensive and suitable technologies. The water treatment technologies are used for three purposes i.e. water source reduction, wastewater treatment and recycling. At present, the unit operations and processes are combined together to provide what is called primary, secondary and tertiary treatment. The primary treatment includes preliminary purification processes of a physical and chemical nature while secondary treatment deals with the biological treatment of wastewater.

Primary water treatment technologies

In this category, the water is treated at primary level using screening, filtration, centrifugation, sedimentation, coagulation, gravity and flotation methods. Normally, these methods are used when water is highly polluted.

Secondary water treatment technologies

The Secondary water treatment includes biological routes for the removal of soluble and insoluble pollutants by microbes. The water is circulated in a reactor which maintains at high concentration of microbes. The microbes are usually bacterial and fungal strains that convert the organic matter into water, carbon dioxide and ammonia gas.

Tertiary water treatment technologies

Tertiary water treatment technologies are very important in wastewater treatment strategy as they are used to obtain safe water for human consumption. These techniques are used for the purpose of distillation, crystallization, evaporation, solvent extraction, oxidation, coagulation, precipitation, electrolysis, electro-dialysis, ion exchange, reverse osmosis and adsorption.

It is a resource, containing not only water and organics, but also increasing the valuable nutrients. The Phosphate is now being recovered and economics will favour the recovery rather than destruction or dumping of other constituents typically present at very low concentrations.

Therefore, the waste management is very important from the point of view for the environment and health. This is because, generally, the waste products are toxic. The waste which is generated may enter into water resources and contaminant it again. A large amount of solid waste is generated in the screening, filtration, centrifugal separation, sedimentation and gravity separation, coagulation, flotation, aerobic process, anaerobic process, evaporation and precipitation processes.

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CONCLUSION

The water treatment technologies discussed that differ from each other in terms of their principles, scope of application, speed and economy. The one way for manufacturing the chemicals and designing the equipment used to treat wastewater to high output standards. This includes coagulants, floc destabilization aids, aerators, centrifuges, UV reactors, ion exchange systems, and increasingly, membranes. The feasibility of water recycling technique is at a commercial level that depends upon the cost of construction, maintenance and operation. The Sludge management is also an important factor for the selection of a technology.