Solar Catalysis Process For Complete Mineralization Of Pharmaceutical Pollutant From Pharma Centres Using Novel ZnO Based Solar Catalyst

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Abstract

The pharmaceuticals compounds are found in the water from more than the four decades. The methods used for sewage treatment are not always successful in removing the active chemicals from the waste water. Therefore, these pharmaceutical compounds entering into the aquatic life through different water resources and it also affect the food chains. The waste water from the pharmaceutical industries has solids, biodegradable and non-biodegradable organic and inorganic compounds etc. The drugs like diclofenac, acetyl salicylic and phenazone is found in the surface water.Both Nano Filtration and Reverse Osmosis treatment aregood. Recovery of the pharmaceutical compound also reduces the waste elimination in pharmaceutical waste water. With the help of nano filtration, we can recover more than 80% of the pharmaceutical compounds.Diclofenac is highly dangerous for the cattle's and the vultures. These pharmaceutical compounds effect the human health which may result in chronic damage, reproductive damage, behavioural change.Both Nano Filtration and Reverse Osmosis treatment aregood. Recovery of the pharmaceutical compound also reduces the waste elimination in pharmaceutical waste water. With the help of nano filtration we can recover more than 80% of the pharmaceutical compounds.

Keywords: Solar; catalysis; zinc oxide, nanofiltration; mineralization.

1. Introduction

The pharmaceutical compounds are used in the modern society for the various purpose.Many industries such as pharmaceutical, chemicals, paints etc. are speedily growing inIndia [1].But the Pharmaceutical industries are releasing very harmful contaminants which affect our environment and human health. There are very few

pharmaceutical industries are releasing the waste after chemical modifications [2-3]. When the pharmaceutical compounds reach in the environment, they are considered as the environmental pollutants. Pharmaceutical companies are releasing a large quantity of waste during the manufacturing and in maintenance of the drugs [4]. The Pharmaceutical compounds also effect the birth rate of the fish and cause the reproductive abnormalities in fishes. These pharmaceutical compounds also affect the pH of the water and TDS (Total Dissolved solids).Lets discuss more examples related to this: Edulabad Village which is situated in Telangana, since the Amberpet STP was opened the villagers starts suffering from the serious health issues. All kids faced eye infection problems and adults peoples faced body outer layer bon pains, diarrhoea etc. The milk produced by the animals in this village tastes and smells bad.All kids faced eye infection problems and adults peoples faced body outer layer bon pains, diarrhoea etc. The milk produced by the animals in this village tastes and smells bad. Fishes in this village regularly die due to the chemical wastes present in the water body. Peddagudem Village which is situated in Telangana and clean H_2O tankers are delivered to the village and villagers are paying for the fresh water.In the absence of H_2O_2, CuO exhibited a lower catalytic activity. FeO nanoparticles are used for the removal of different colours but the only limitation is that textile industry effluent will be containing mixed colours and of various concentrations but the studies were carried out for selected range of variables.

2. Pharmaceutical compounds and their environmental affect

The pharmaceuticals compounds are found in the water from more than the four decades. The methods used for sewage treatment are not always successful in removing the active chemicals from the waste water. Therefore, these pharmaceutical compounds entering into the aquatic life through different water resources and it also affect the food chains. The waste water from the pharmaceutical industries has solids, biodegradable and non-biodegradable organic and inorganic compounds etc. Drugs like diclofenac, acetyl salicylic and phenazone is found in the surface water [5-6]. Diclofenac is highly dangerous for the cattle's and the vultures. These pharmaceutical compounds effect the human health which may result in chronic damage, reproductive damage, behavioural change. The Pharmaceutical compounds also effect the birth rate of the fish and cause the reproductive abnormalities in fishes. These pharmaceutical compounds also affect the pH of the water and TDS (Total Dissolved solids).Lets discuss more examples related to this: Edulabad Village which is situated in Telangana, since the Amberpet STP was opened the villagers starts suffering from the serious health issues. All

kids faced eye infection problems and adults peoples faced body outer layer bon pains, diarrhoea etc. The milk produced by the animals in this village tastes and smells bad. Fishes in this village regularly die due to the chemical wastes present in the water body. Peddagudem Village which is situated in Telangana and clean H_2O tankers are delivered to the village and villagers are paying for the fresh water. The industries present nearby dumping the waste material without treating into the river. In Bonthapalle Village, peoples avoid to eat the food they grow here in their fields but this food is mostly sold everywhere.Hetero operates a factory here. The village wells are contaminated and bore water is also not suitable for drinking. The village people are suffering from the different kind of cancers etc[7].

3. Decontamination process and utilization

The Traditional aquatic effluent treatment method is activated sludge method.Thefour major processes for the removal of pharmaceuticals in the activated sludge process includes air-stripping, photo transformation, biotransformation and sorption.Sorption process is the removal process for the pharmaceuticals waste in water.[8]It depends on the interaction of the chemicals with microorganisms,their aggregation and precipitation.Only few aquatic effluent treatment methods are effective in removing the pharmaceuticals compounds from aquatic effluent but not all. In Member filtration, activated pharmaceutical waste which includes microfiltration , ultrafiltration, Nano filtration, reverse osmosis , electro dialysis reversal etc. Microfiltration and ultrafiltration are not fully effective for the removal of the contaminants as pore size 100-1000times. Both Nano Filtration and Reverse Osmosis treatment aregood. Recovery of the pharmaceutical compound also reduces the waste elimination in pharmaceutical waste water. With the help of nano filtration we can recover more than 80% of the pharmaceutical compounds. [9]

4. Solar-catalytic material selection for solar-catalysis

ZnO-CuO nanocomposites are also used for the Photocatalytic Degradation of Lidocaine HCl. FeO and Al2O3 nanoparticles have been used to remove the bacteria i.e. pseudomonas and enterobacter from water.Two different sizes 30nm and 50 nm nanoparticles was made. Al2O3 nanoparticles are much more efficient to kill bacteria as compare to FeO nanoparticles. 30 nm alumina nanoparticles which are smaller in size than 50 nm nanoparticles gives more valuable results and no growth of bacteria was found.[10]. In the absence of H_2O_2,

CuO exhibited a lower catalytic activity. FeO nanoparticles are used for the removal of different colours but the only limitation is that textile industry effluent will be containing mixed colours and of various concentrations but the studies were carried out for selected range of variables[11-12].

5. Conclusion

ZnO-CuO nanocomposites are also used for the Photocatalytic Degradation of Lidocaine HCl. FeO and Al2O3 nanoparticles have been used to remove the bacteria i.e. pseudomonas and enterobacter from water.Two different sizes 30nm and 50 nm nanoparticles was made. Al2O3 nanoparticles are much more efficient to kill bacteria as compare to FeO nanoparticles.Both Nano Filtration and Reverse Osmosis treatment aregood. Recovery of the pharmaceutical compound also reduces the waste elimination in pharmaceutical waste water. With the help of nano filtration we can recover more than 80% of the pharmaceutical compounds.Recovery of the pharmaceutical compound also reduces the waste elimination in pharmaceutical waste water. With the help of nano filtration we can recover more than 80% of the pharmaceutical compounds.

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