

Waste to Bioplastic: Bioplastic Production From Potato Processing Industry Wastewater

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In the last decades there has been a significant increase in the amount of plastics being used in various sectors (Lagaron and Lopez-Rubio, 2011).Plastics are considered very important materials due to their properties and performance over other materials such as metal and wood. Therefore, this industry generated huge amounts of plastic waste that accumulate in the environment at a rate of more than 300 million tons per year (European Commission, 2011).The plastics have caused extensive environmental problems associated with their disposal methods(Wu, 2009). Also, with the increased use of plastics, people have become concerned about the negative environmental impacts of them (Stevens, 2002).

Rapid increases in the cost of petroleum and rising environmental/legislative pressures have induced the development of bioplastic. Bioplastics have been manufactured from variety renewable resources such as corn, sugar and potato. It is estimated that the global bioplastics production and demand capacity is set to grow 500 % by 2016 (European Bioplastics, 2013). Despite the growth of bioplastic industry, there have been challenges about their cost. Also, there is an increasing debate on the competition between food, animal feed and industrial usage for renewable resource. Therewithal, the current trend is using of food by-products in order to potential competition with agricultural resources for foods and also to reduce production cost.

In this study we investigated the production of bioplastics from potato processing industry wastewater which contains 55-60 g/L starch. To produce starch-based bioplastics, potato processing industry wastewater was collected, and centrifuged. Settled starch was separated from the supernatant and dried. Starch and starch/clay mixture were used to produce two different bioplastic. Thermal and mechanical properties of these samples were also investigated.

Bioplastics are novel materials of the twenty-first century and would be of great importance to the materials world (Mohanty et al., 2002). Choice of renewable resource is an important role of bioplastic production technology. Reuse of industrial waste/wastewater topics are current investigations in these years. In the future, most of food industries may produce their own bioplastics from their waste/wastewater.

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