

A Comparison Study on Competitiveness of Bioplastic Categories

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Abstract

Ocean plastic pollution is now a well-known human-made disaster. To combat this problem, many kinds of activities and researches, such as cleaning up the beaches, improving the recycling efficiency, and developing bioplastics, have been made recently. Among them, developing bioplastics, either biobased or biodegradable, is essential because constant usage of conventional fossil-based plastics will cause the continuous consumption of fossil fuels and the accumulation of plastic wastes. Despite a large number of bioplastics in the market, very few studies have categorized them accurately to include all of them and provide a holistic view. Thus, this study categorized commercial bioplastics into three types: biobased & biodegradable plastics, fossil-based & biodegradable plastics, and biobased & non-biodegradable plastics. Then, the analysis of their competitiveness based on the following six criteria, 'Public Opinion,' 'Technology,' 'Price,' 'Sustainability,' 'Governmental Support,' and 'Market Attractiveness,' were conducted.

In conclusion, biobased & non-biodegradable plastics are advantageous in their low production costs, similar mechanical strengths to that of fossil-based plastics, and recyclability. On the other hand, biobased & biodegradable plastics are still expensive to produce, and composting procedures were immature. However, the support from the government and the public on biobased & biodegradable was the highest among the three categories. Finally, fossil-based & biodegradable plastics show fast market growth because of the low oil price at the time. It is the author's anticipation, however, that they will eventually shift towards to biobased plastics. As an exploratory study, this study contributes to providing some useful guidelines for classifying and comparing bioplastics in terms of competitiveness.

Keywords: Bioplastics, biobased, biodegradable, competitiveness of bioplastics, bioplastic classification

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