

**A REVIEW ON THE DEGRADATION
OF PLASTIC WASTE UNDER VARIOUS
ENVIRONMENTAL CONDITIONS**

NUR FARAH IZZATI BINTI HAKMAL

**Bachelor of Engineering (Hons) Civil
(Infrastructure)
UNIVERSITI TEKNOLOGI MARA
SEPTEMBER 2020**

**A REVIEW ON THE DEGRADATION OF
PLASTIC WASTE UNDER VARIOUS
ENVIRONMENTAL CONDITIONS**

By

NUR FARAH IZZATI BINTI HAKMAL

The report is submitted as a
partial requirement for the degree of
Bachelor of Engineering (Hons) Civil (Infrastructure)


**UNIVERSITI TEKNOLOGI MARA
SEPTEMBER 2020**

AUTHOR'S DECLARATION

I hereby declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Author : Nur Farah Izzati Binti Hakmal
Author I.D. No : 2016647728
Programme : Bachelor of Engineering (Hons) Civil (Infrastructure)
Faculty : Civil Engineering
Thesis Tittle : A Review on the Degradation of Plastic Waste Under
Various Environmental Conditions

Signature of Author : 

Date : September 2020

ABSTRACT

Globally, due to the overwhelming plastic production, over a million tons of plastic waste were produced by every country in the world. Most of the plastic will end up at the landfill in which it constituted around 20-30% in municipal solid waste stream. However, about 40 percent million tons of plastic which could have been washed in the oceans, also ubiquitously found in land and waterways. The problem is the plastic wastes have created many environmental issues that threatening human, flora and fauna even though it is claim as non-biodegradable. Studies found that plastic can be degraded until the micro size which pose more peril to the sustainable of ecosystem. Therefore, this study will review about the degradation of different type of plastic in different environmental conditions; water, soil, landfill and natural weathering. This includes the factors affecting plastic degradation by different degrading agents. The rate of degradation is also affected by both of the environmental conditions and characteristics of polymer. The changes in plastic properties such as tensile strength, carbonyl index, surface morphology and loss of weight corresponding to the exposure time are reviewed. Findings showed that the longer duration time of plastic exposure, the more the degradation effect on the plastics especially in its properties. Nevertheless, different types of plastic would have a different degradation effect as a result of different polymer and additives composition in the plastics. This review is important to support decision making on the recycling approach of plastic, fate of natural decomposition and renewable energy recovery from the degraded plastic. Other than that, improvement on the present status of landfilling practice and major waste polymer treatment technology can be attained from the review.

ACKNOWLEDGEMENT

In the name of Allah, The Most Merciful. Above everything, I would wish to express my gratitude to Allah S.W.T. first and foremost which allow me to fulfill my role in the execution of this final year's project with the opportunities and strength. I would like to express to my deep gratitude to Dr. Salina Bt Alias, as my supervisor for her advice, her patient guidance, enthusiastic encouragement and useful critiques that inspire me to complete this Final Year Project.

I would like to extend my thanks to Mr. Faizal Zakaria, the Environmental Laboratory Assistant, for advising me. In addition, thanks to all my friends for their help in supporting and assisting me in the completion of this Final Year Project. To my batchmates, thank you for all the knowledge we have been share together throughout these 4 years.

Last but not least, I would like to take this opportunity to express my gratitude and most sincere thanks to my beloved parents, Hakmal Bin Solah and Norida Bt Parjo for their support and encouragement throughout this process in completing my thesis at home due to the pandemic. Without them, I would not have the courage to finish my final year project until the end.