

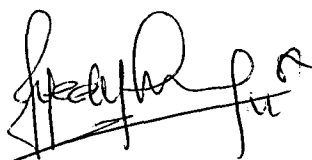
**THE STUDY OF DYNAMIC MODULUS THERMAL ANALYSIS ON
DIFFERENT TYPES OF POLYMER**

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**Final Year Project Report Submitted in
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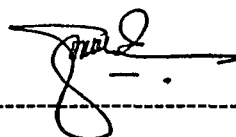
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ABSTRACT

THE STUDY OF DYNAMIC MODULUS THERMAL ANALYSIS ON DIFFERENT TYPES OF POLYMER

This study was conducted to determine dynamic mechanical properties for different types of pure polyethylene like high density polyethylene (HDPE) and low density polyethylene (LDPE) with references to frequency and temperature. Temperature scan in the range of (-120⁰C to 150⁰C) were performed and determined with Perkin Elmer DMA-7 in three point bending mode. Storage modulus (E'), loss modulus (E'') and mechanical loss factor (tan δ) were recorded during testing. Storage modulus (E'), loss modulus (E'') were found to be decreasing whereas the mechanical loss factor (tan δ) increasing due to temperature employed. Storage modulus (E') for high density polyethylene (HDPE) is higher than low density polyethylene (LDPE) because the molecular chain for high density polyethylene (HDPE) consists of lower degree of branching. It also observed that as frequency increase, the values of tan δ and loss modulus (E'') decrease whereas the value of storage modulus (E') increase in the case of both high density polyethylene (HDPE) and low density polyethylene (LDPE).

CHAPTER 1

INTRODUCTION

Nowadays, almost every product design involves the use of plastic or rubber in some shape or form. Plastic are now used in almost every application, ranging from household, space travel, transportation, packaging, medicine, toys and many more. In many of the established industries, plastic have provided a significant improvement in the performance characteristic of the product. Plastics are design depend on properties such as heat tolerance, hardness, resilience's and many others with relatively low density material. Plastics provide good resistance to chemical, corrosive attack and can act as good electrical insulators. One of reason why uses of plastic increases because the cost of plastic is much lower than metal or timber, but plastic also have disadvantages where plastic are not bridgeable when disposed in landfills. So, it will create environmental problems. Many countries create a new way to overcome this problem which is by recycling process.

The term 'Polymer' and 'plastic' are often used as if they are synonymous. Polymers refer to the pure chemical substance or material produced as a direct result of polymerization process. It is a term used to describe molecules consisting of structural