UNIVERSITI TEKNOLOGI MARA

FORMATION OF COMPOSITE BOARD BY USING HDPE AND SAWDUST/RICE HUSK WITH ADDITION OF MALEIC ANHYDRIDE AS COUPLING AGENT

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ABSTRACT

In this study, composites were prepared by using two main ingredients; that are high density polyethylene (HDPE) as the matrix and mixture of rice husk and sawdust as the filler. The composites were divided into two types; composites which contain coupling agent, and the composites that did not containing coupling agent. The coupling agent used in this study is maleic anhydride (MA). The aim of this study was basically to prepare the two types of composites and to know the effect of addition of coupling agent and effect of different ratio of matrix and filler toward mechanical properties of produced composites. For this study, composites were prepared at 170°C with different ratio of matrix and filler [1]. The composites was tested with several tests; mechanical properties of the prepared composites. The bending strength of the composite was increasing with addition of coupling agent MA and also increased as the percentage of filler increased. As for the tensile strength, the addition of coupling agent lowers the tensile strength. However, there are slight inconsistencies at 40% filler. This inconsistency may due to the presence of air bubble in the composites.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Composite board or also known as wood-plastics composite are a product which is widely used since last 40 years [2]. Due to its wide usage, it is constantly changing in term of usage and application. It can be said that composite board has been used as a replacement for regular wood or board. They are used in wide variation; whether structural or non-structural application. It can be used indoor as well as outdoor; for example it can be used as construction materials, garden and yard components, it even be used inside the automotive (engine and interior), household item and consumers good. However, the most popular usage of composite are the construction industry and automotive application [2].

Composite board usually made up of filler which come from wood fiber or organic material and matrix which also known as thermoset or thermoplastic [3]. Thermoset is basically a type of plastic which once cured, cannot be melted by heating such as epoxies and phenolic. While thermoplastic is basically a type of plastic that can be repeatedly melted. For the matrix, thermoplastics are more preferable due to its ability to be melted multiple times allowing it to be shaped and recycled. The composite having characteristics such as low density, low manufacturing cost and it is renewable and recyclable [1].

Composite board can be derived from used item. For example, the organic material can be come from used wood particle or any plant waste, such as the sawdust, rice husk and many more. The matrix is not necessarily comes from virgin thermoplastics.