UNIVERSITI TEKNOLOGI MARA

MECHANICAL STUDIES OF ACRYLONITRILE BUTADIENE STYRENE REINFORCED CARBON BLACK BLENDS

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Abstract

The use of acrylonitrile-butadiene-styrene has shown its potential in synthetic engineering plastics however many studies suggested that modifications should be made to assure the improvement on the mechanical properties of ABS. As the highlight of this research, carbon black (CB) blends were reinforcing into ABS and the mechanical properties of ABS reinforced carbon black blends are studied as the flexural strength, modulus and impact strength are determined. The preparation for ABS/CB was carried out by using a Haake Rheomixer OS at a temperature of 210 °C at 60 rpm. The flexural testing and impact testing are conducted according to standard methods ASTM D790 and ASTM D256 respectively. The flexural results showed that with increasing amount of CB, ABS/CB composite became stiffer. Alternatively, the impact strength peaked at 20% CB with strength of $1.33 \times 10^{-3} kJ/m^2$. Filler loading has been proven to improve the mechanical properties of ABS composites by increasing the interfacial bonding between ABS and CB blends.

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Table of Contents

Chapter 1

Introduction

1.1 Research Background

Polymers have been given attention due to their splendid potential in engineering plastic industries. Polymer is a material composed of monomers that has repeated amount and bind together into chains or branches. They also act as good insulators and come with extra properties such as easy to mould, higher strength than steel and accessibility for processing. Every polymer is identified as lightweight material and most of the polymer can be resistant to chemical materials. Polymers have proved their potential in engineering plastic industries as they act as a good thermal and electricity insulators. Polymer has been classified into two major types which are thermoplastic polymers and thermoset polymers. ABS is one of the examples of thermoplastic polymers and further discussion will be written on the next chapter. For last a few decades, the usage of ABS in synthetic engineering industries is receiving special attention as it has outstanding properties on various resistances such as heat, impact and chemical. According to Wang