POLYPROPYLENE BLEND WITH CHARCOAL

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ABSTRACT

A STUDY OF POLYPROPYLENE POLYMER BLENDS WITH CHARCOAL FIBER

The effects of the presence of charcoal in polypropylene polymer blends were studied. This was the first attempt to produce new composite in industry by using charcoal incorporated into polypropylene polymer blends. Five type of testing had been done and conducted to determine the properties of the composite of polypropylene-charcoal. There were tensile strength, impact testing, Differential Scanning Calorimeter, Fourier Transform Infrared Spectrometer and flammability test. In this study, thermoplastic composites were made from blending virgin PP pellets with the charcoal by melt compounding and then compression molding. The mechanical properties and functions of these composites were investigated. The compositions of blended ratio were also studied in this work. The results show that the mechanical properties of the PP with 5 wt% charcoal composites were better than that of the PP composites with 10, 15 and 20 wt% of charcoal composition. The cystallinity of polymer blends decreased compared to neat PP. From flammability test, it was found that this composite was not suitable be used as flame retardant.

CHAPTER 1

INTRODUCTION

1.1 Background and problem statement

A composite material was a product that been produce by combining two or more materials to give new unique combination of properties. In composite materials, one phase is usually continuous and called the matrix, while the other phase is a reinforcing material which is called the dispersed phase.

Making composite structures was more complex than manufacturing most metal structures. To make a composite structure, the composite material, the heat and pressure were applied. The resin matrix material flows and when the heat is removed, it solidified. It can be formed into various shapes. In some cases, the fibers were bound tightly to increase the strength. One useful feature of composites was that they can be layered, with the fibers in each layer aligning in a different direction.

Although fibers are strong they can be brittle. The matrix can absorb energy by deforming under stress. This approved that the matrix adds toughness to the composite. In some cases, fibers have good tensile strength but with low compressional strength.