

CHAPTER I

INTRODUCTION

The competitiveness of Canadian pulp and paper is threatened by emerging industries that capitalize on the fast-growing forests in southern climates. Producing new, value-added paper products is one of the ways that Canada can strengthen its global position in pulp and paper.

Chitin is the second most abundant natural polymer in the world after cellulose. It is found in fungi, arthropods and exoskeletons of crustaceans (shrimp, crab and other shellfish). Chitosan is obtained from chitin by a deacetylation process. Chitosan possesses a wide range of useful properties. Specifically, it is biocompatible, antibacterial and environmentally friendly, thus lending itself to a wide variety of applications such as water treatment, additives for cosmetics, textile treatment for antimicrobial activity, biomedical devices etc.

Chitosan has many interesting properties, such as antimicrobial activity biodegradability and non toxicity, which can bring added value to paper. However, it is difficult to find a proper solvent for mixing chitosan with other polymers. Chitosan has limited water-solubility though it can dissolve in aqueous solution at low pH (or acidic conditions).

The objectives of this work were to enhance the water-solubility of chitosan to facilitate its application in paper products as an antimicrobial additive. The mechanical and optical properties of paper using modified chitosan as additive were investigated. In addition, the effects of various variables for paper making were studied.