

CHAPTER I

INTRODUCTION



Cellulose is a natural high molecular weight polymer found in plants. It is renewable and biodegradable. Studies on cellulose have revealed that it has four polymorphs, celluloses I, II, III and IV. All these polymorphs contain same molecular structure of cellulose polymer chains but they are different in crystal structures, hydrogen bonding patterns, and reactivity towards chemicals. They are interchangeable except for the transformation of cellulose II to cellulose I.

The objectives of this work are to study the transformations among cellulose polymorphs of cotton woven and knitted fabrics using basic chemicals and the simplest treatments and to determine some properties of the fabrics at each stage of cellulose polymorphs. All untreated and treated fabric samples were tested for the stage of cellulose polymorphs, degree of polymerization, the damage factor, the fabric strength, and the dye absorption. An understanding of this study can help to choose the best stage of cellulose polymorphs of various cotton woven and knitted fabrics for industrial applications.