

ABSTRACT:

The cyclodextrins (CDs) are well known for their ability to form inclusion complexes with various types of guest molecules, which fit partially or completely into the host CDs cavity as shown by crystallographic results. Such beneficial property of CDs has been applied in many industries, for example, foods, pharmaceuticals and agriculture. Benzoic acid (BA) has been proven to form inclusion complexes with α -CD and β -CD. Globally, the fashion industry is more interested in new and versatile fabrics, characterized by specific mechanical and physicochemical properties, for the production of polymers with highly specific properties such as, antibacterial properties. In this work, we reported a study on the formation of the inclusion complex between acrylamidomethylated β -cyclodextrin and benzoic acid molecules, then on the grafting of cellulosic polymer (rayon and cotton fibers). The grafting was initiated by ceric ions Ce (IV) and confirmed by infrared analysis (FTIR). Microscopic analysis was carried out to evaluate properties of structure and surface of grafted fibers. Our results indicated the formation of a permanent chemical bond between β -cyclodextrin and polymers material. The cellulosic polymers can be effectively modified without significant change in the structural properties; more so, the antibacterial molecules probes remain integrated into the fiber surface. In addition, absorption tests showed that the grafted functions clearly improve retention of liquids by cellulose; however, the bacterial reduction obtained by these new functions is very significant on the Gram+ and Gram- bacteria.