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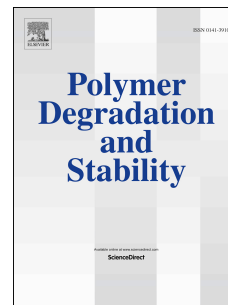
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Sustainable Fire Retardancy of Textiles Using Bio-macromolecules

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Abstract

The field of the flame retardant finishing of polymeric textile substrates is facing numerous challenges for the living beings because of the toxicity, carcinogenicity and effluent generation issues related to the finishing agent used for developing this novel property. Therefore, to this end, a lot of innovative researches have been performed and reported by the researchers to meet those critical issues. In the same line, very recently, different bio-macromolecules also have come into the domain of the fire retardant finishing. The latest research findings on the fire retardancy of polymeric substances using different bio-macromolecules (protein, plant, starch, chitosan based) are critically summarized in this review. The mechanisms behind the thermal stability of the materials are also highlighted in detail. Besides, the article provides a brief knowledge on the thermal degradation, structural composition of both the bio-macromolecules and the polymeric substrate. The degradation mechanism of bio-macromolecule treated polymeric substrates is also presented. In addition, the composition summarizes the comparison on the effect of different bio-macromolecules imparted to textiles. Advantages and current challenges of using these novel bio-macromolecules in the area of fire retardancy of materials have also been discussed.

1.0 Introduction

The most simple and common fire retardant chemicals available for cellulosic materials are inorganic salts, borax and boric acid mixture [1], di-ammonium phosphate, urea, ATO/BrFr formulations and other different phosphorous, nitrogen

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