Functional regenerated cellulose-based fibers with dye absorption or fire retardancy properties

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Fabricating textile fibres with diminished environmental footprint and improved functional properties is a relevant research matter within the bounds of more sustainable industrial processes [1,2]. So, in the present communication, two sets of functional regenerated cellulose-based fibres, with improved dyeing or flame-retardant properties will be presented.

In a first study, regenerated wood pulp fibres were functionalized with glycidyltrimethylammonium chloride (GTAC) to prepare fibres with cationic pending groups for improved dye absorption. The modified cellulose fibres exhibited distinct morphologies and contact angles, good thermal stability and better dyeability than the non-modified ones. In fact, their values of dye exhaustion and dye fixation are 34% and 77% higher than those obtained for the non-modified fibres. Therefore, these regenerated wood pulp fibres from the pulp and paper industry can be utilized, after cationization, as textiles fibres with enhanced dye absorption offering new options for dyeing treatments.

In a second study, cellulose fibers with fire retardancy properties were prepared by combining regenerated wood pulp fibers and a phytic acid derivative. The functionalized fibers were characterized in relation to composition, molecular structure, crystallinity, morphology, surface charge and wettability, color properties, thermal-oxidative stability, and fire retardancy performance. The attained results confirm the potential of these functional regenerated wood pulp fibers for application as textile fibers with fire retardancy properties.

References

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