

Novel materials with antimicrobial and antifungal properties obtained by ozonation of cyclodextrins: from synthesis to practical applications

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Summary

The degradation of our environment has been becoming a growing concern with the increase of industrialization and ever-increasing commercialization of chemical substances. Therefore, innovative researches have been involved for several years to develop eco-friendly products in substitution to usual pesticides and crop protection chemicals. In this study, a novel oxidative material was produced directly by gas-solid reaction between ozone (O₃) and cyclic polysaccharides 2-hydroxypropyl-β-cyclodextrin, (2-HP-β-CD). The influence of the main process parameters was studied by using a Design Of Experiment (DOE) strategy to both optimize the oxidizing power of the final product and assess the effect of the main synthesis process parameters on the material properties and by-products formation. In order to test the proficiency of the final product, microbiological and fruit preservation tests were also conducted. In the light of the results obtained, regarding the potential use of these materials in practical applications may be interesting.

Keywords: Ozone, cyclodextrin, pesticide