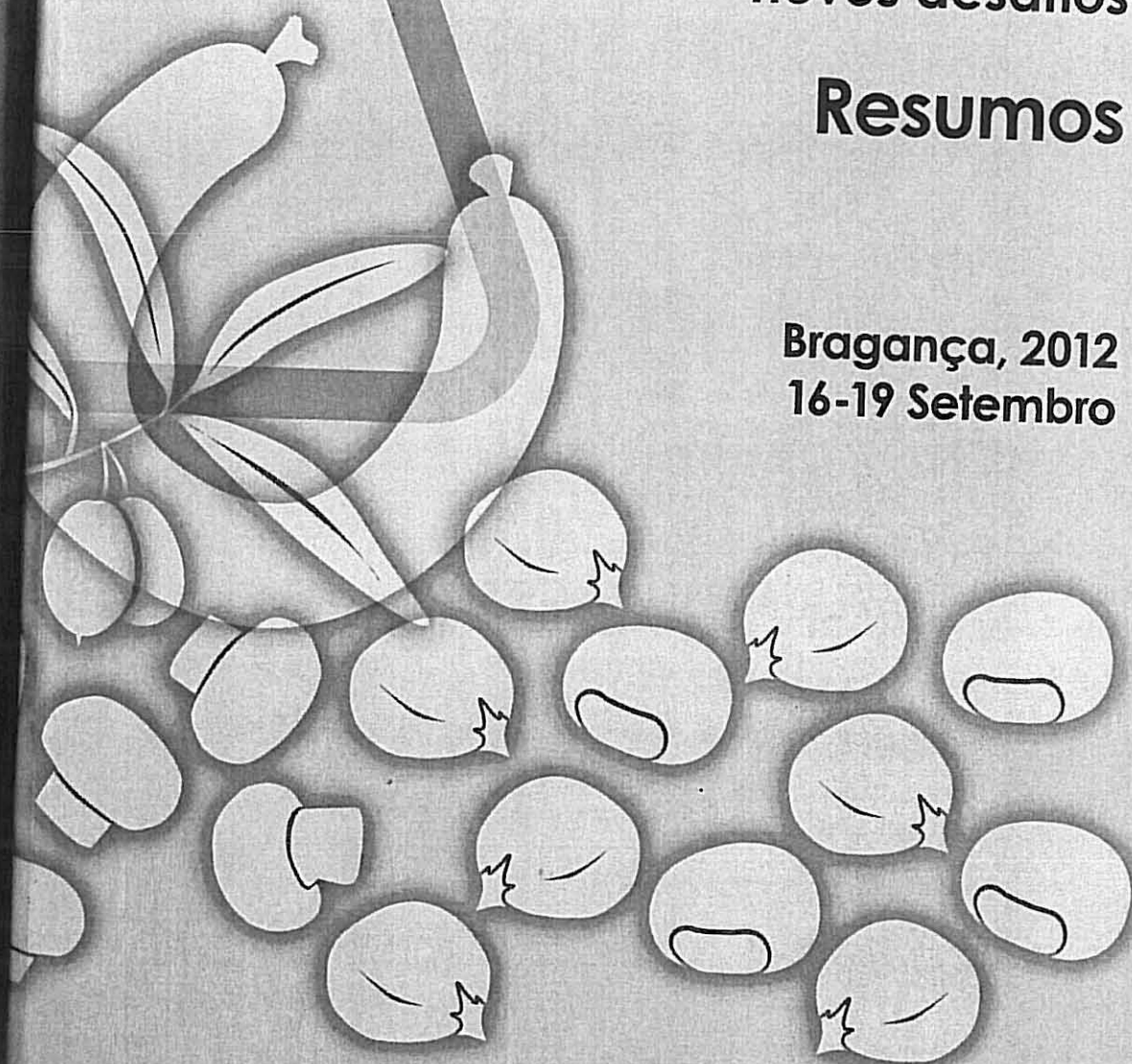


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Resumos

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α -Tocopherol microencapsulation using chitosan and alginate: swelling behaviour under different pH

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Vitamin E is known for its antioxidant activity, particularly for its effective protection against lipid oxidation. The theory that reactive species, such as free radicals, may be involved in the development of degenerative processes associated with aging and cancer has led to a growing interest in the study of most antioxidants. In particular, Vitamin E is considered a lipophilic antioxidant, comprising a set of eight compounds (α -, β -, γ -, δ -tocopherols and tocotrienols), of which α -tocopherol is the one presenting the highest capacity of free radicals uptake, *in vitro*. Due to α -tocopherol instability and sensitivity towards temperature, oxygen and light, vitamin E supplements are generally administered in the most stable form of α -tocopherol acetate or succinate. However, these forms are considered to have a lower intestinal absorption.

In this study, microencapsulation of α -tocopherol was tested using two polymeric matrices (chitosan and alginate). The microencapsulation process was developed using a NISCO Var J30 unit, firstly optimized with the chitosan-based system. In a second step the alginate-based one was tested and tuned, and thereafter α -tocopherol microencapsulated using both systems. As a last step microspheres behaviour towards acid, neutral and basic pH environments was evaluated using optical microscopy (OM) (Figure 1). As expected, it was found that both systems maintain their integrity at neutral pH. The microspheres based on chitosan resist basic pH conditions and swell and even disintegrate at acidic pH. In opposition, alginate microspheres tolerate the acidic pH conditions being highly swelled in basic medium, however without being destroyed.

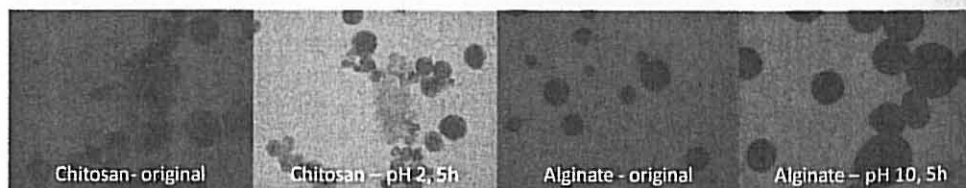


Figure 1. OM analysis of original and final microspheres subjected to two pH environments.

Face to the obtained results the developed microencapsulation process constitute an interesting solution to protect α -tocopherol when controlled release in acidic (stomach) or basic (intestinal tract) is desired, respectively if chitosan and alginate are used. The work will proceed to further optimize the process and access the release profiles.