ABSTRACT

Micro- and nanoencapsulation have generated great interest over the last years in multiple fields. Particularly in the food industry, this technology presents potential applications for the development of smart packaging structures, as well as for the protection of sensitive ingredients and the production of novel healthy foods. Therefore, in this thesis, the development of different encapsulation structures of interest in the food area was carried out. Specifically, capsules were obtained through electrohydrodynamic processing, since this technology presents several advantages over other well-established encapsulation technologies. For instance, it does not require the use of high temperatures and encapsulation structures from some biopolymers can be attained by using aqueous solutions.

Initially, microencapsulation for smart packaging applications was investigated. In this area novel heat management packaging structures were obtained through the encapsulation of phase change materials (PCMs) within different polymeric matrices. The morphology, thermal properties, molecular organization and thermal energy storage ability of these capsules were evaluated.

Afterwards, the encapsulation of bioactive ingredients for functional food applications was studied. In this field, novel micro- and nanoencapsulation structures were initially obtained through electrospraying from food contact materials. Finally, a vitamin and an antioxidant were encapsulated within different hydrocolloid matrices through electrospraying. Capsules attained were characterized and compared to those obtained through other encapsulation techniques. Moreover, stability of the encapsulated bioactives was studied under adverse conditions.