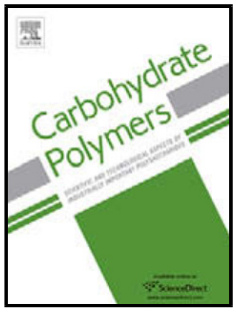

Title: Production of pectin-whey protein nano-complexes as carriers of orange peel oil

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Production of pectin-whey protein nano-complexes as carriers of orange peel oil

Running title: Pectin-WPC nanocomplexes loaded with limonene

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Research Highlights:

- Orange peel oil could be encapsulated by nanocomplexes of WPC–pectin.
- The encapsulation efficiency of orange peel oil was about 70-88%.
- The best ratio of WPC to pectin for strong complex formation was 4 to 1.
- Smallest particles containing orange peel oil were achieved in pH=6.
- The strongest complex coacervation was obtained in pH=3.

Abstract

Orange peel oil is one of the most common flavorings used in the food industry which is volatile under environmental conditions. Encapsulation is the best way to protect it and control its release. One of the nanoencapsulation systems for food bioactive ingredients is complexation method, which entraps the core materials in a complex of two different biopolymers. In this study, orange peel oil was nanoencapsulated by pectin-whey protein nanocomplexes. After determining the optimum nanocomplex suspensions containing orange peel oil based on the stability, viscosity, and color, they were formulated in three different pH values (3, 6 and 9) and converted into powdered forms by freeze drying. The analysis of size and zeta potential of nanocomplexes revealed that the smallest particles formed in pH=6. The encapsulation efficiency of the powders at pH= 3, 6 and 9