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2022

New Trends in Polymer Science:
Health of the Planet, Health of the People

25–27 May 2022, Turin, Italy



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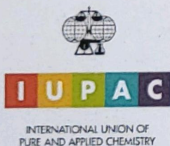
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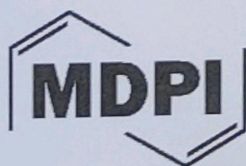
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A.7 Application of Natural Polymers for the Design of the New β -Carotene Complexes

Antanas Straksys, Ruta Gruskiene, Jolanta Sereikaite

β -Carotene (CAR) is a natural pigment composed of a polyene system with eleven conjugated double bonds and a β -ring at each end of the chain. It has various biological activities that contribute to human health. However, the application of β -carotene is limited due to its low water solubility and chemical instability. Those drawbacks can be overcome by designing new delivery systems for β -carotene. The study is aimed to develop the new β -carotene complexes using xylan (XYL) and chitosan and fucoidan. The materials used for encapsulation have beneficial effects for human health, e.g. antimicrobial and antioxidant activities or serve as a prebiotic fiber [1-3].

The encapsulation of β -carotene was performed by a layer-by-layer method and subsequent freeze-drying. First, the complex of β -carotene and xylan was prepared using three different CAR/XYL mass ratios from 1/1 to 1/3. Further, the complexes were coated with chitosan and finally by fucoidan. The interaction of components was shown by Raman and FT-IR spectroscopies. The size and zeta-potential of particles were determined by the DLS method. The morphology of the complexes was analysed by SEM. The antioxidant activity was measured using DPPH and FRAP assays and expressed in Trolox units (mgTE/g).

The prepared new β -carotene complexes have the potential for applications in food and cosmetics.

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- [2] Inanli, A.G. et al., Trends in Food Science & Technology 97 (2020).
- [3] Luthuli, S. et al., Marine Drugs 17(2019).