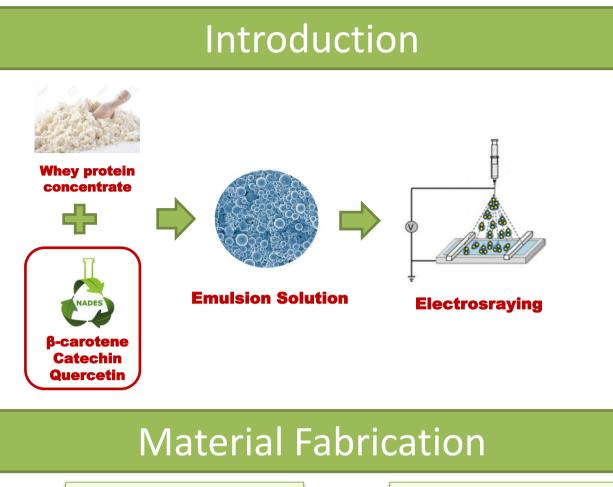
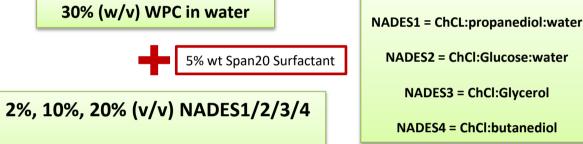
Microencapsulation of Bioactives by Emulsion Electrospraying Using Natural Deep Eutectic Solvents

A.O. Basar¹, C. Prieto², E. Durand², H. Sasmazel¹ and J.M. Lagaron². 1. Atilim University, 2. IATA-CSIC

Email: lagaron@iata.csic.es





		Flow Rate	Voltage
98:2 / 90:10 / 80:20 Emulsion	Process	50 – 100 μL/h	17-23 kV

β-carotene, Catechin, Quercetin

Results

Loading Capacities

Bioactive	Loading Capacity (%)
β-carotene (in NADES1)	1.67 x 10 ⁻³
β-carotene (in NADES2)	0.0667 x 10 ⁻³
β-carotene (in NADES3)	0.667 x 10 ⁻³
β-carotene (in NADES4)	6.67 x 10 ⁻³
Quercetin (for all NADES')	33.2 x 10 ⁻³
Catechin (for all NADES')	33.2 x 10 ⁻³
β-carotene (in Lagaron et al. [1])	79.3 x 10 ⁻³

^{*}Loading Capacities were calculated for the concentration of 2% (v/v) NADES' for each emulsion systems.

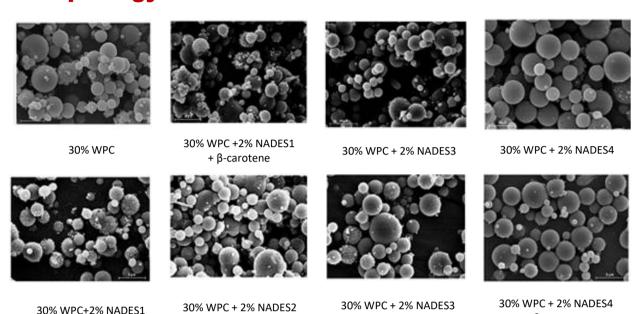
Results

Morphology

30% WPC + 10% NADES3

Collector

10-18 cm



+β-carotene



30% WPC + 10% NADES4

SEM (Hitachi S-4100 electron microscope, Tokyo, Japan)

Emulsion System	Loading Capacity of β-carotene
30% WPC + 10% NADES3	3.7 x 10 ⁻³
30% WPC + 10% NADES4	37 x 10 ⁻³
30% WPC + 20% NADES3	8.3 x 10 ⁻³

30% WPC + 20% NADES3

Conclusions

Microcapsules encapsulating bioactives can be produced by emulsion electrospraying using NADES.

Higher loading capacity of β -carotene can be obtained using 'green solvent' NADES for potential food applications.

This opens new opportunities for the application of these solvents in combination with electrospraying technology for the production of new delivery systems suitable for the food industry.



[1] A. Lopez-Rubio, J.M. Lagaron, Whey protein capsules obtained through electrospraying for the encapsulation of bioactives, Innovative Food Science and Emerging Technologies 13 (2012) 200-206.