One Step Process of Forming Complex Coacervation During Spray Drying

Tech ID: 30011 / UC Case 2017-959-0

CONTACT

Ediz O. Yonter

eoyonter@ucdavis.edu

tel: .

INVENTORS

- Jeoh, Tina
- Scher, Herbert B.
- Tang, Yuting

OTHER INFORMATION

KEYWORDS

Microencapsulation, In situ complex coacervation, Spray-drying, Biopolymers

CATEGORIZED AS

- **Materials & Chemicals**
  - Biological
  - Chemicals
  - Nanomaterials
  - Polymers

RELATED CASES

2017-959-0

ABSTRACT

Researchers at the University of California, Davis have developed a formation of complex coacervate microparticles by spray drying.

FULL DESCRIPTION

Complex Coacervation is a process whereby the electrostatic association of oppositely charged macromolecules form an insoluble matrix. Conventional technology for forming complex coacervation microcapsules has been stagnant for decades as the complex multistep process remains an obstacle for industrial-scale production of microparticles.

Researchers at the University of California, Davis have developed methods and compositions of matter for the formation of complex coacervate microparticles by spray drying. The technology provides a one-step spray drying process to utilize polymers similar to those currently used in the conventional multistep processes without chemical crosslinking, enabling controlled release of a wide variety of potential substrates.

APPLICATIONS

- Formation of complex coacervation in one-step spray drying
- Microencapsulation of bioactive cargo for incorporation in functional foods, nutraceuticals, pharmaceuticals, cosmetics, agriculture and functional materials

FEATURES/BENEFITS

- Simplifies the process of complex coacervation by spray drying
- Does not need chemical crosslinking, thus eliminates the need for toxic chemicals
- Leads effective pH-controlled release barrier
- Enables high throughput microencapsulation of active compounds in complex coacervate matrices

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,612,870	03/28/2023	2017-959

RELATED MATERIALS

- Strobel, S.A., Scher, H.B., Nitin, N., Jeoh, T. 2016. In situ cross-linking of alginate during spray-drying to microencapsulate lipids in powder. Food Hydrocolloids, 58, 141-149.
- Devi, N., Kakati, D.K. 2013. Smart porous microparticles based on gelatin/sodium alginate polyelectrolyte complex. Journal of Food Engineering, 117(2), 193-204.
- Dong, Z., Ma, Y., Hayat, K., Jia, C., Xia, S., Zhang, X. 2011. Morphology and release profile of microcapsules encapsulating peppermint oil by complex coacervation. Journal of Food Engineering, 104(3), 455-460.
- Yuting Tang, Benjamin Arbaugh, Hayeon Park, Herbert B. Scher, Li Bai, Liang Mao, Tina Jeoh 2023. Targeting enteric release of therapeutic peptides by encapsulation in complex

coacervated matrix microparticles by spray drying. Journal of Drug Delivery Science and Technology, 79, 104063.

OTHER INFORMATION

GLP-1s like Ozempic are among the most important drug breakthroughs ever - The Economist

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- A Spray-Drying Method for Encapsulating Biological Molecules in Cross-linked Alginate Microcapsules
- Protection of Beneficial Microbes During Spray Drying Using Food, Ag, or Forestry Residues
- Spray Dry Method for Calcium Cross-linked Alginate Encapsulation of Biological and Chemical Moieties via the Use of Chelating Agents
- Methods and Compositions for Protecting Gram-Negative Bacteria from Thermal and Osmotic Stress During Dehydration Using Gelatin

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:
530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax:
530.754.7620