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Encapsulation of essential oils into degradable microcapsules for controlled release

Many essential oils (EO's) possess a wide spectrum of biological activity including anti-microbial, fungicidal, insecticidal/insect repellent, herbicidal, acaricidal and nematicidal properties. They provide a simple, inexpensive, and environmentally-friendly pest control. However, the volatility and water-insolubility of EO's render their utilization as pesticide less appealing. To resolve these issues, EO's were encapsulated into tiny shells (i.e., microparticles). For the encapsulation of EO's into microparticles, EO droplets were generated in the ethanol-water mixture through

phase-separation. Subsequently, these tiny droplets were surrounded by protein molecules to prevent them from coalescing. Depending on the characteristics of employed proteins, the prepared microparticles showed different stabilities. For further stabilization of microparticles, the prepared microparticles were additionally coated with degradable synthetic polymer. The characteristics, encapsulation efficiency, and effective time of final products will be discussed.

Biography

Sanghoon Kim received Ph.D. in polymer physical chemistry from University of Wisconsin-Madison. He has worked in National Institute of Standards and Technology in Gaithersburg, Maryland for five years for the research in the field of polymer blends. After moving to USDA national lab in Peoria, Illinois, in 1997, he worked on the characterization of carbohydrates and proteins, and developed novel bio-based materials from agricultural products for industrial applications. His current research is focused on the development of nano- or micro- capsules that deliver agrochemicals for controlled release.

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