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Der Pharmacia Lettre, 2021, 13 (12): 01-02
(http://scholarsresearchlibrary.com/archive.html)

ISSN 0975-5071
USA CODEN: DPLEB4

A Note on Microencapsulation

Paul Secombe*

Department of Pharmacy, University of Melbourne, Melbourne, Austrralia

****Corresponding author:*** *Paul Secombe, Department of Pharmacy, University of Melbourne, Melbourne, Austrralia, E-mail: paulsecombe@gmail.com*

ABOUT THE STUDY

Microencapsulation is a method of covering minute particles or droplets in a covering to generate tiny capsules with therapeutic properties. Encapsulation technologies are required to keep probiotics afloat during storage and within the human gut, increasing their ability to colonies the colon. Microencapsulation is used to reduce food product odours, volatility, and reactivity, as well as to increase food product stability when exposed to harsh circumstances examples are light, O_2, and pH. Antibacterial treatments, UV protection, moisturizing and skin treatments, body temperature regulation, repellence and smell or aroma release are all examples of microencapsulation in textiles. It is used to include food ingredients, enzymes, cells, and other things on a micro meter scale.

A microcapsule is a small spherical container with a near-uniform wall that encloses an element in its purest form. Some materials can be blended with the material of interest to trap it inside, such as lipids and polymers like alginate. Most microcapsule pores are a few nanometers to a few micrometers in diameter. The most commonly used coating materials include ethyl cellulose, polyvinyl alcohol, gelatin, and sodium alginate. The term has been broadened to cover most foods, with flavor encapsulation being the most prevalent method. The physical and chemical qualities of the material to be encapsulated define the microencapsulation technology to use. Microencapsulated self-healing chemicals have also been used to create self-healing polymer coatings. Under certain circumstances, such as when an enteric pharmaceutical coating is utilized, the capsule contents can be released by melting or dissolving the capsule wall.

Microencapsulation is a technique for reducing the absorption of a medicine into the body. This may allow one controlled release dose to replace numerous non-encapsulated drug doses, as well as reduce hazardous side effects for some pharmaceuticals by preventing high initial blood concentrations. In most cases, a specific release pattern is desired. It is zero-order in some circumstances, and the release rate is constant. During the time that the microcapsules are effective, they distribute a predetermined amount of medicine per minute or hour.

This is possible as long as the microcapsule contains a solid reservoir or a dissolving medication. The concentration differential between the interior and outside of the capsule reduces as the drug diffuses. Other mechanisms, however, may be implicated in the release of the enclosed substance. Examples include biodegradation, osmotic pressure, diffusion, and other mechanisms. The makeup of the capsule and the environment in which it is put will decide each one.

As a result, the liberation of the material may be influenced by a number of mechanisms operating at the same time. Micro-encapsulation has wide range of applications. They are anti-corrosive coatings, adhesives E-paper or e-ink, carbonless copy paper essential oils, flavors, and other volatile bioactive used in food or feed additives pesticides, pharmaceuticals, small molecules, and more recently peptides and small proteins for oral or sublingual administration, phase change materials, powder perfume, scratch-and-sniff, self-healing materials, such as novel plastics that can automatically repair damage, textiles, temperature release (controlled release) in baking, thermo chromic dyes, time release technology for pharmaceuticals, visual indicators, self-healing coatings, DNA degradation protection for product tracing and data storage.