Zein-lecithin nanoparticles formation as a thyme essential oil delivering system

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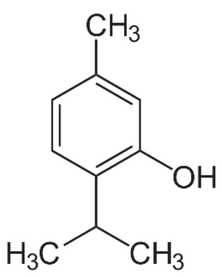
Introduction:

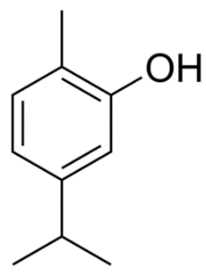
Nanoparticles (NP) have been used as nanocarriers for dermal and transdermal drug delivery, enhancing drug penetration into and across the skin, improving drug activity. Thyme essential oil (*Thymus vulgaris*) has been used, due to its content of phenolic compounds mostly thymol (≈38%) and carvacrol (≈29%), as an anti-inflammatory, antiseptic, antispasmodic and analgesic compound, making it useful for inflamed and acne-erupted skin treatment (Sarikurkcua et al., 2015), its encapsulation into polymeric matrices is an alternative for the preservation of its characteristics and bioactive properties (Gonçalves da Rosa et al., 2015). The aim of this study was the develop and characterization of zein-lecithin nanoparticles to be used as skin delivery systems for thyme essential oil.

Materials & Methods:

NANOPARTICLES → NANOPRECIPITATION



Thymol



Carvacrol

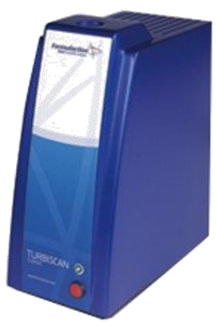
Zein | Lecithin | pH | PVA

Central Points

Relation 1.25:1 | pH 3.5 | 1.065%

Encapsulation Efficiency

Particle Size/ PDI



Stability

2 µl/ml

Results & Discussion:

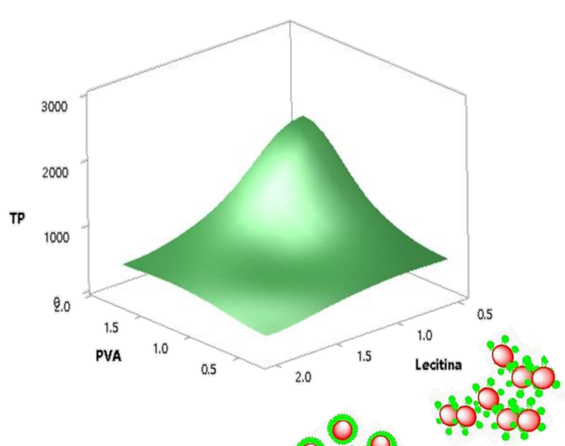


Figure 1.

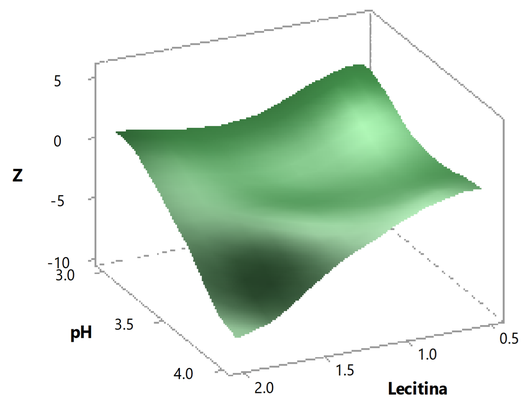


Figure 2.

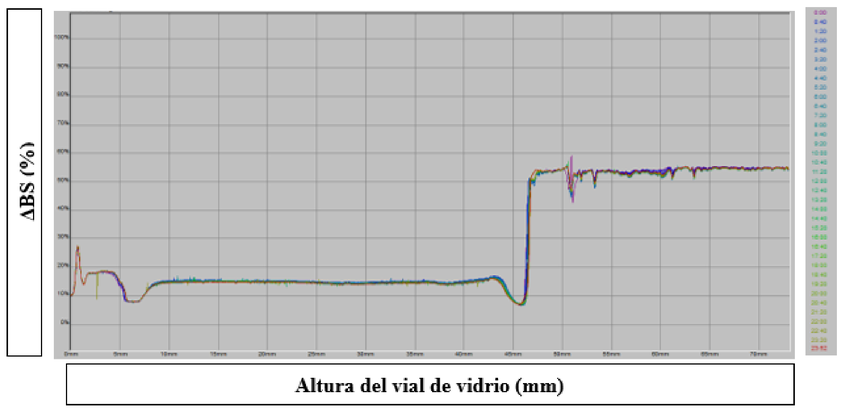


Figure 3.

Conclusions:

It was determined that the system formed by the interaction between **zein and lecithin is suitable for the preparation of nanoparticles** through the nanoprecipitation process, in addition, they have the **ability to act as nanocarriers, presenting high encapsulation efficiencies** (higher 70%), being suitable for use as continuous release systems for active agents. Lecithin concentration is the most important parameter for the reduction of particle size and a narrow PDI.

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