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Nanoencapsulation of Neem Oil Using Inulin and Modified Starch for Use as Bioinsecticide

MARIA E. FUENTES-CAMPOS,[1*] MARÍA VERONICA CARRANZA-OROPEZA[1],
[1]Facultad de Química e Ingenieria Química ,
Universidad Nacional Mayor de San Marcos
Lima, Peru
mariaelizabeth.fuentes@unmsm.edu.pe
mcarranzao@unmsm.edu.pe

Extended Abstract

Nowadays the use of nanotechnology is increasing in different fields, for example in agriculture the use of nanocarriers for pesticides is important for disease control of plants. Many researchers are focusing on control release formulations (CRF) of bioactive compounds present in essential oils (EOs) as alternatives for reducing the risks to the environment and effects on health. Essential oils contain active metabolites such as terpenes, alkaloids, monoterpenes, limonoids, and others [1]. These metabolites have antifeeding properties against the insects since these when in contact decrease their activity. However, the biggest inconvenience of using essential oils is their chemical instability in the presence of factors such as air, light, dry, and high temperatures which cause rapid evaporation and degradation of the active components [2]. To solve these problems surge nanocarriers that can encapsulate EO through the polymeric matrix for it is important to investigate resources that have advantages as available, feasible, and safe for handling; the polysaccharides as starch, cellulose, chitosan, inulin are examples of these advantages [3].

Our research involves the use of inulin and modified starch as major encapsulating matrices for neem oil formulation using a green method for obtaining nanoparticles of polysaccharides and modification of starch with citric acid, two formulations for encapsulating neem oil were prepared: one with inulin and other with inulin-modified starch using green solvent and conditions as gelatinization temperature [4]. The morphology, physical and chemical characterization was performed by attaining FT-IR, FE-SEM, DLS, and UV-Vis. The stability of solids showed major stability in the inulin matrix, the shape of this matrix was spherical, and uniform compared and inulin-starch. Functional groups of nanoencapsulation of neem were confirmed by FT-IR and finally the characteristic peak the absorbance of neem was detected by UV-Vis at 296nm.

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