



9th International Interdisciplinary Congress on Renewable Energies, Industrial Maintenance, Mechatronics and Informatics  
*Booklets*



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## Title: Biofilm of potato starch and silver nanoparticles

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Editorial label ECORFAN: 607-8695

BCIERMMI Control Number: 2024-01

BCIERMMI Classification (2024): 241024-0001

RNA: 03-2010-032610115700-14

Pages: 09

CONAHCYT classification:

Area: Engineering

Field: Engineering

Discipline: Chemical engineering

Subdiscipline: Bioengineering

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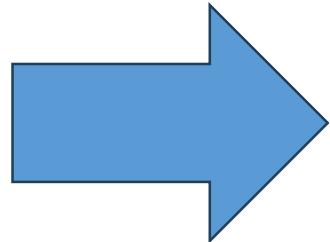
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# Introduction

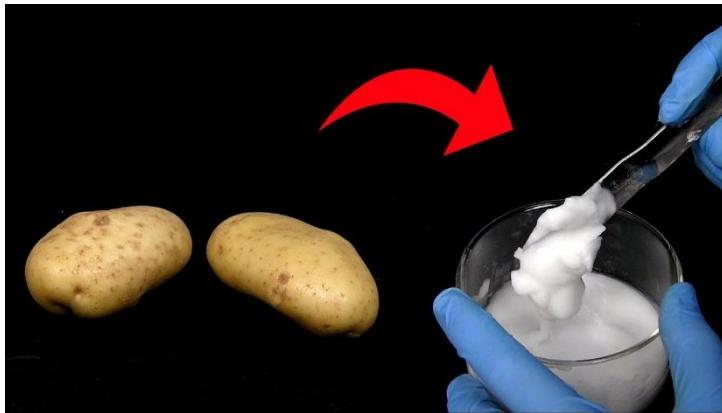
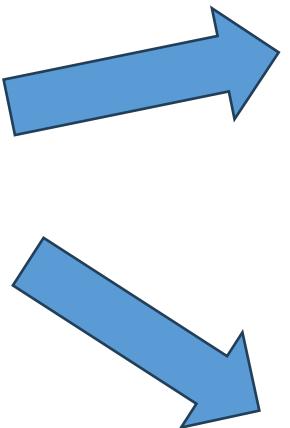


**Biopelículas**



**Frutas**

The use of nanotechnology to prolong the lifetime of the fruits and reduce the loss during these are transported, is an innovative concept for the food industry.



# Methodology

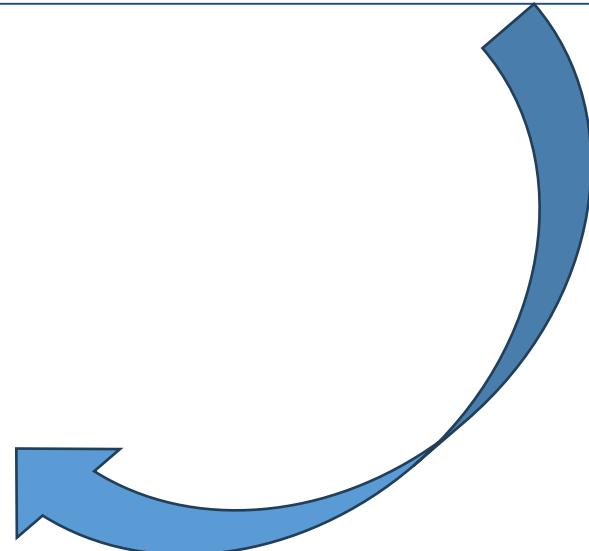
## Síntesis de Nps Ag



## Extracción de almidón de papa

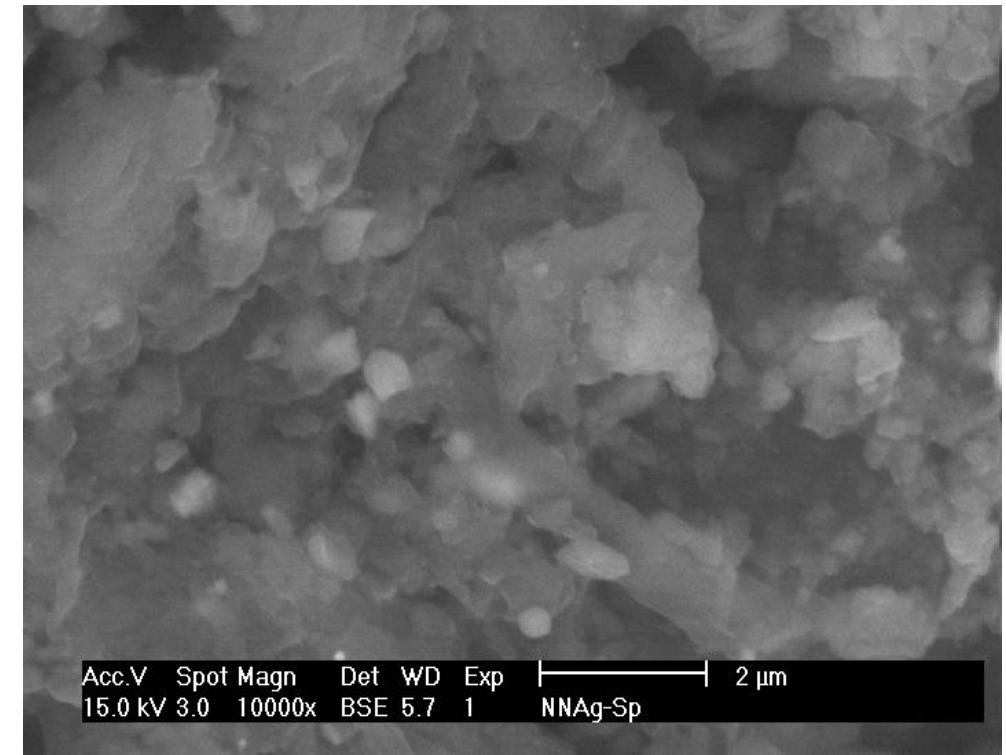
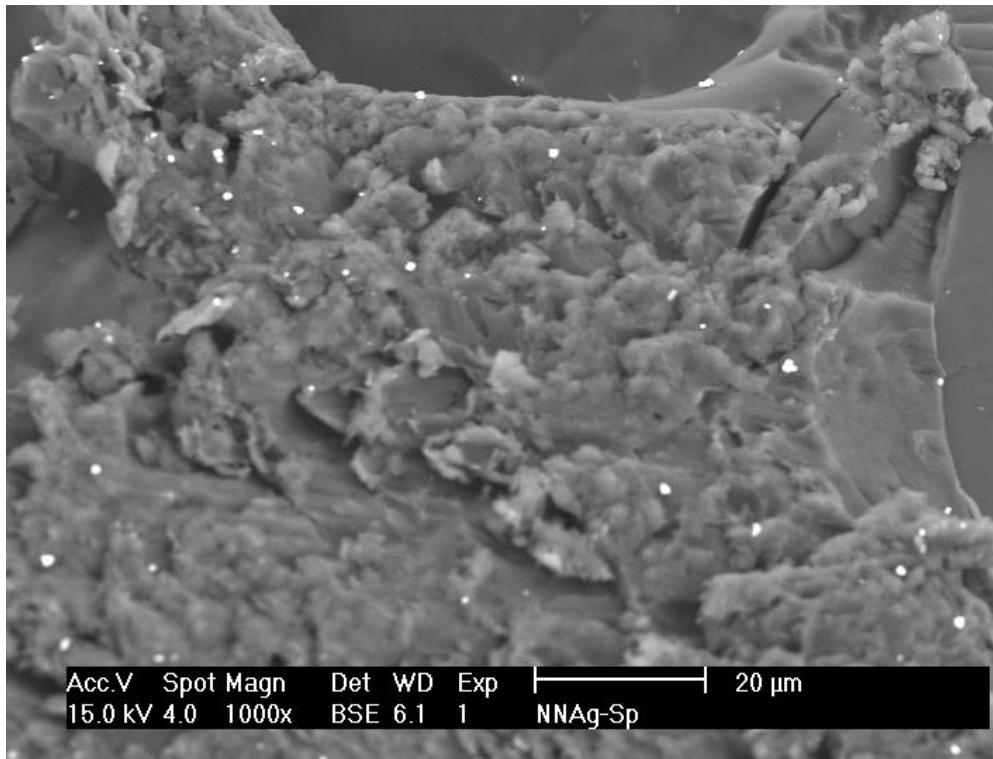


## Elaboración de recubrimiento

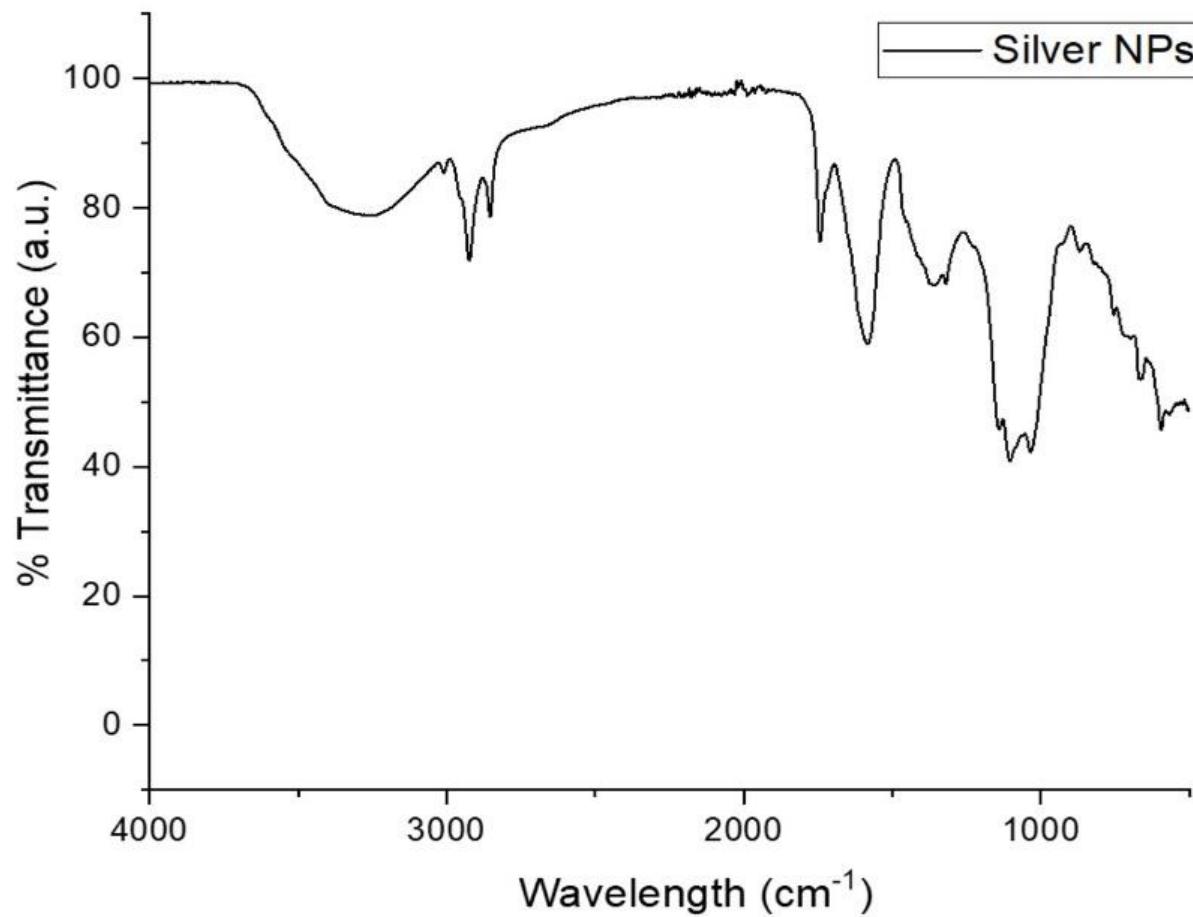


# Results

## Microscopia electrónica de barrido (MEB)

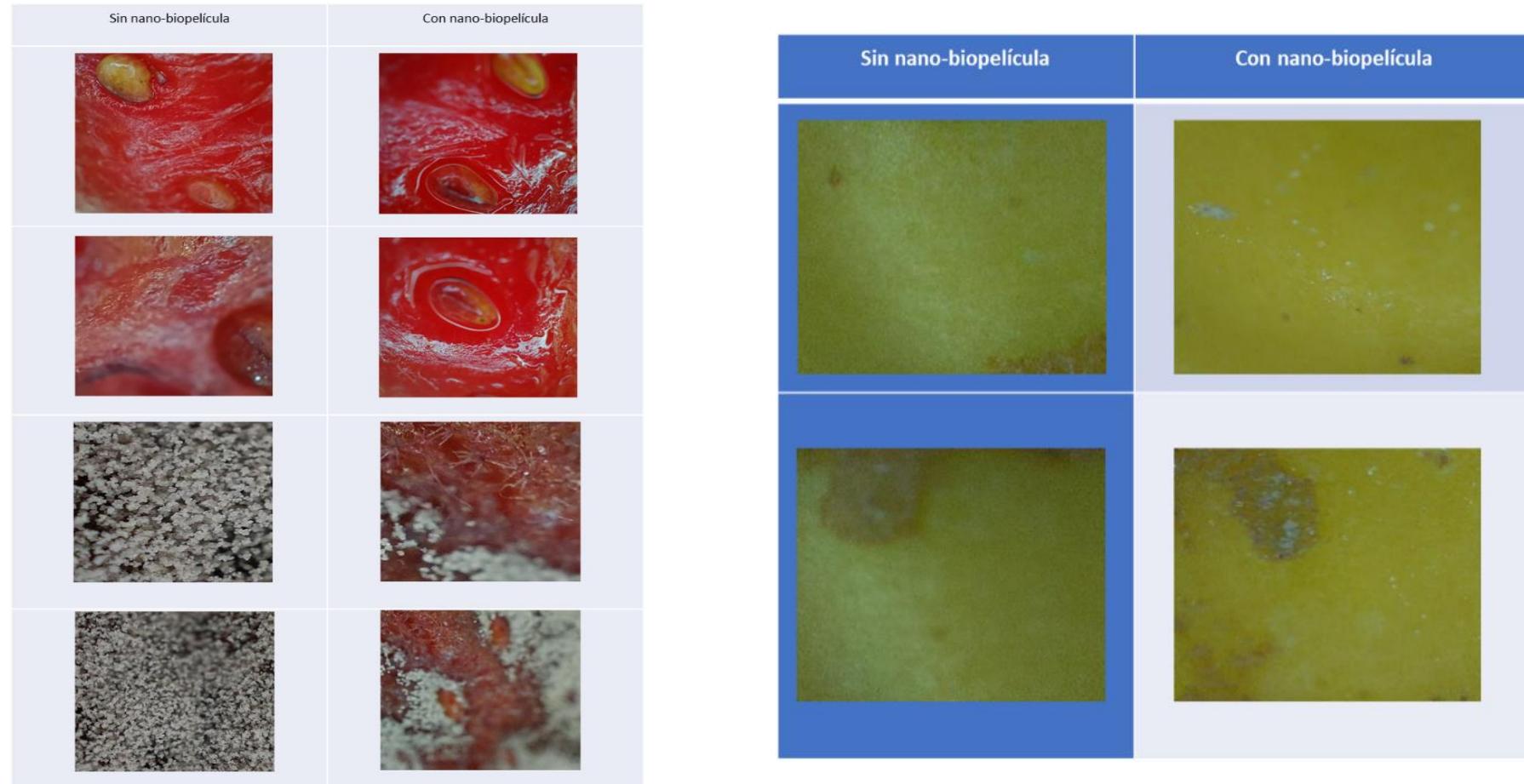


# Espectroscopia de Infrarrojo (FT-IR)



| Intensidad                  | Señal            |
|-----------------------------|------------------|
| 3000-3900 $\text{cm}^{-1}$  | Grupo O-H        |
| 2000 -2850 $\text{cm}^{-1}$ | Tensión de C-H   |
| 1251-1255 $\text{cm}^{-1}$  | estiramiento C-O |

A nano-biofilm was elaborated using potato starch, with silver nanoparticles incorporated.



# **Conclusions**

The development of the nano-biofilm based in the potato starch and silver has demonstrated to be a solution in the conservation of strawberries and apples. With the passing of the test and improvements, this product has a potential to change the food industry with the reduction of losses during the transport and storage, it would contribute to satisfy the increasing demand of food in a constant growth market.

# References

Alfredo Vázquez-Ovando Lourdes Adriano-Anaya Rosmeri Méndez-De León Salvador Figueroa Miguel. (2013). Elaboración y caracterización física de biorecubrimientos compuestos basados en quitosán. *Quehacer Científico en Chiapas*, 8(2013), 26–34.

Cortez-Mazatán, G. Y., Valdez-Aguilar, L. A., Lira-Saldivar, R. H., & Peralta-Rodríguez, R. D. (2011). Polyvinyl acetate as an edible coating for fruits. Effect on selected physiological and quality characteristics of tomato. *Revista Chapingo. Serie: Horticultura*, XVII(1), 15–22. <https://doi.org/10.5154/r.rchsh.2011.17.003>

Lira-Saldivar, R. H., Argüello, B. M., Villarreal, G. D. L. S., & Reyes, I. V. (2018). Potencial de la nanotecnología en la agricultura. *Acta universitaria*, 28(2), 9–24. <https://doi.org/10.15174/au.2018.1575>

López, M. L. (23 de Octubre de 2020). Recubrimiento de Poli(Acetato De Vinilo-Co-Alcohol Vinílico) Adicionado con Nanopartículas de Óxido de Calcio y su Efecto en la Poscosecha de Pepino (*Cucumis sativus*). Centro de Investigación en Química Aplicada.

Lopez-Carrizales, M., Pérez-Díaz, M. A., Mendoza-Mendoza, E., Peralta-Rodríguez, R. D., Ojeda-Galván, H. J., Portales-Pérez, D., Magaña-Aquino, M., Sánchez-Sánchez, R., & Martinez-Gutierrez, F. (2022). Green, novel, and one-step synthesis of silver oxide nanoparticles: antimicrobial activity, synergism with antibiotics, and cytotoxic studies. *New Journal of Chemistry*, 46(37), 17841–17853. <https://doi.org/10.1039/d2nj02902b>



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