



University of Zabol  
Faculty of Agriculture  
Department of Food science and industry  
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(In the field of Food Chemistry)

***Title***

The effect of combination of alpha-tocopherol antioxidant and edible polymers prepared by electrospraying method on oxidation of olive oil

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## *Abstract*

Oil oxidation is one of the main food products. Adding antioxidants is one of the best ways to prevent antioxidants. Considering that polar compounds are less effective than non-polar compounds in oil, the purpose of this study is the effect of combining edible polymers of zein, gelatin and antioxidant alpha-tocopherol by electrospraying on the amount. The efficiency of this antioxidant was in olive oil. For this purpose, gelatin and zein were dissolved together with the antioxidant alpha-tocopherol at a level of 10%, and microcapsules of polymers and antioxidants were prepared by electrospraying. The results obtained from SEM showed that the microcapsules had a spherical shape with the addition of alpha-tocopherol, and the largest average diameter was obtained for gelatin-alpha-tocopherol microcapsules. Also, the FTIR test for zein and gelatin polymer microcapsules with alpha-tocopherol showed a shift in the peak, which indicated the formation of hydrogen bonds between polymers and antioxidants, and showed that the loading of alpha-tocopherol in zein and gelatin microcapsules It has been successful.

The results of the efficiency test, which is the most important test in electrospraying technology, show how much alpha-tocopherol is present in the prepared microcapsules. The results obtained from this test indicated that the amount of antioxidants in the There was zein microcapsule and 95.9% of alpha-tocopherol in gelatin microcapsule. Then, the effect of antioxidant activity of microcapsules produced in olive oil was investigated by determining the induction period of olive oil. The results showed that the highest efficiency of the polymer-antioxidant mixture was at a concentration of 0.02%, so that the induction period for the mixture of gelatin-alpha-tocopherol (221.55) and zein-alpha-tocopherol (197.22) was obtained, which is significantly higher than the sample It was witnessed (173/68 hours).

By increasing the concentration of the polymer-antioxidant mixture, the efficiency decreased significantly even compared to the control sample, and the lowest antioxidant activity was observed at a concentration of 0.08%, because the stability of polymers that were made of protein decreases with increasing concentration.

**Keywords:** Alpha-tocopherol, Distribution coefficient, Peroxide value