

Antioxidative Activity of Nanoparticles of Rosemary

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Abstract : This work aimed to study the antioxidative activity of nanoparticles ZnONPs Zinc oxide using rosemary water and ethanolic extracts .Structural and optical properties of nanoparticles using transmission electron microscope showed a spherical shape of ZnO nanoparticles of average particle size 2.8 to 3.8 nm . Zinc oxide nanoparticles of rosemary water and ethanolic extract was added to sunflower oil (200 and 300 ppm) as natural antioxidant compare with Tertiary Butylhydroxy Quinone (TBHQ) as synthetic one. Oxidative stability and thermal process for 12 hours at 120°C for treated sunflower oil with different antioxidants were estimated. Obtained results indicated that the total phenolic contents being 45.44 and 58.36 mg of GAE/g. in water and ethanolic rosemary extract respectively, while total flavonoids being 22.58 and 88.26 in the same extracts respectively .Rosemary ethanolic extract exhibited the highest DPPH activity in compare with the water extract .Identification and fractionation of phenolic compounds using HPLC cleared that ten phenolic compounds(162.6 and 88.32 mg/100g) were separated. Cinnamic acid the most abundant phenolic compound in rosemary extracts was, while rosmarinic was the most abundant flavonoids compound in the same extracts 78.83 and 67.91 mg /100 g. respectively. Obtained data for oxidative stability using rancim at showed that treated sunflower oil with ZnONPs rosemary ethanolic extract at the concentration of 200 and 300 ppm the highest showed stability time (20 months of storage) in compare with other treated sunflower oil samples. Results for thermal process of treated sunflower oil ZnONPs using RME at the concentration of 300 ppm were recorded the lowest values of hydrolysis, oxidation and rancidity parameter after 12 hours heating. So, addition of ZnONPs rosemary extract to sunflower oil showed a positive effect on the oxidative and thermal stabilities of such raw material and could be recommended as an alternative antioxidant in oil.

Keywords: Antioxidative Activity, Nanoparticles, Rosemary.

Rania E. El-Gammal /International Journal of ChemTech Research, 2016,9(12): 844-854.
