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Green synthesis of zinc oxide (ZnO) nanoparticles and determination of its antioxidant and antiradical activity

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It is known that metal oxide nanoparticles have protective effect against ultraviolet photons. Also, they have antioxidant and anti-bacterial effects. In this study, green synthesis of zinc oxide nanoparticles was done with a simple method using peroxidase enzyme and partially purified from fig leaves. The effects of reaction conditions such as optimum pH, temperature and time period were determined. The results showed that ZnO nanoparticles were synthesized in the high yield. The morphological characterization of ZnO nanoparticles were investigated using UV-VIS spectroscopy, scanning electron microscope (SEM) and X-Ray diffraction. Also, antioxidant and antiradical activities of ZnO NPs were evaluated. ZnO nanoparticles of antioxidant and radical scavenging activities Fe^{3+} - Fe^{2+} reduction activity with ferric cyanate reduction method, cupric ions reduction activity with cupric method, Fe^{3+} reducing capabilities according to the FRAP method, ferrous ions (Fe^{2+}) chelating activity, superoxide anion radical ($O_2^{\cdot-}$) removal activity and 2,2'-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS⁺) radical scavenging activity were determined. BHA and a-tocopherol were used as standard antioxidants in this study. It was determined that ZnO NPs had effective radical reducing activity and ZnO NPs were very effective in their radical removal activity and it was also determined to have higher activity than the standard. It was thought that the potential use of ZnO nanoparticles in biomedical and cancer applications is gaining interest in the scientific and medical communities.

Biography

Esen Tasgin has completed her PhD in 2004 from Ataturk University, Turkey. She continues to work as an Associate Professor at Ataturk University in Erzurum in Turkey. She has published many papers in reputed journals.

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