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Antioxidative Activity of Galic acid-functionalized ZnO Nanoparticles

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In this study, we report a novel antioxidant ZnO nanoparticle that is newly designed and prepared by simple surface modification process. Antioxidative functionality is provided by the immobilization of antioxidant of 3,4,5-trihydroxybenzoic acid (galic acid, GA) onto the surface of ZnO nanoparticles. Microstructure and physical properties of the ZnO@GA nanoparticles were investigated by field emission scanning electron microscopy (FE-SEM), transmission electron microscopy (TEM), infrared spectroscopy (IR) and steady state spectroscopic methods. The antioxidative activity of ZnO@GA was also evaluated using ABTS (3-ethyl-benzothiazoline-6-sulfonic acid) radical cation decolorization assay. Notably, ZnO@GA showed strong antioxidative activity in spite of the conjugation process of GA on the ZnO surface. These results provide that GA-coating onto ZnO nanoparticles may offer an intriguing potential for biomedical devices as well as nanomaterials.

Keywords: Antioxidant, ZnO nanoparticle, Galic acid

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Antimicrobial Activity of Caffeic acid-functionalized ZnO Nanoparticles

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The emergence of new infectious diseases, the resurgence of several infections that appeared to have been controlled and the increase in bacterial resistance have created the necessity for studies directed towards the development of new antimicrobials. In the present study, we have synthesized a novel antioxidant ZnO nanoparticle that is newly designed and prepared by simple surface modification process. Antioxidative functionality is provided by the immobilization of antioxidant 3-(3,4-dihydroxyphenyl)-2-propenoic acid (caffeic acid, CA) onto the surface of ZnO nanoparticles. Microstructure and physical properties of the ZnO@CA nanoparticles were investigated by field emission scanning electron microscopy (FE-SEM), transmission electron microscopy (TEM), infrared spectroscopy (IR) and steady state spectroscopic methods. Antimicrobial Activities of ZnO@CA nanoparticles were measured against various bacterial strains using antibacterial testing methods.

Keywords: Antioxidant, Caffeic acid, ZnO nanoparticle, Antimicrobial Activities