



Biopolymer-Based Green Synthesis of Zinc Oxide (ZnO) Nanoparticles

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Abstract:

The use of biopolymers for the synthesis of different nanomaterials is of enormous interest to modern nanobiotechnology. We have developed a simple, novel, green and low cost method for the synthesis of zinc oxide nanoparticles (ZnO-NPs) by using carrageenan as a marine biopolymer. This work suggests the use of green method serving carrageenan as a stabilizing agent during sol-gel process before calcination in high temperatures to generate ZnO-NPs. The prepared ZnO-NPs were characterized by transmission electron microscopy (TEM), powder X-ray diffraction (PXRD), UV-visible spectroscopy (UV-vis) and Fourier Transform Infrared (FTIR) spectroscopy. Spherical ZnO-NPs were synthesized at different calcination temperatures and TEM images and its corresponding particle size distributional the formation of nanopowders in size of about 49 nm. The PXRD analysis showed the successful synthesis of ZnO-NPs with high purity and crystallinity. The UV-visible spectra showed characteristic absorption peaks of ZnO between 368 and 376 nm and FTIR analysis exhibited Zn-O bands around 402 to 448 cm^{-1} . The biosynthesized ZnO-NPs could offer potential applications in bio-medical field and further studies on its cytotoxicity effects will be made.



Biography:

Hemra Hamrayev have completed his bachelor's degree in Petroleum Engineering from University Technology of Petronas. Currently, his pursuing his masters degree under Dr. Kamyar Shameli's supervision at University Technology of Malaysia. At the same time, he is working as a mathematics teacher at Hibiscus International School.

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