

Synthesis, Preparation and Antimicrobial Effects of $Ag_2S/PbSO_4$ Nanocomposites

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Abstract

The rapid and uncontrolled growth of microorganisms can lead to serious problems. With the development of nanotechnology over the last decade, golden opportunities have been created to discover the antibacterial effects of metallic nanoparticles. Metallic nanoparticles have an antibacterial effect, in addition to the inhibition effect of the particle, due to its small size, large surface area and large outer surface area. Scientists believe that nanoparticles can be used as appropriate alternative to used biochemicals.

Introduction: In the past two decades, the field of nanotechnology has grown exponentially since its birth and has made an immense impact on physical, chemical, earth and biological sciences. There has been an immense extension of nanomaterial applications and uses as a result of basic and applied research from scientists all over the world. One such class of nanomaterials are metal oxide (MeO) and metalsulfides (MeS) nanoparticles (NPs), ranging in size from 1 to 100 nm, available in different shapes and sizes.

Methods and Results: In this research, nanoparticles were first made in 1, 5 and 1.5 mg/l concentrations, then we study antimicrobial properties of nanoparticles by MIC methods and several gram-negative bacteria were examined for several nanostructures. 0.0064 g nanoparticles solved to prepare 100 cc of the medium, weigh the hinton broth 2.1 grams, and in another stock 7.6 g hinton agar in 200 cc water, Then we make microbial leachate from the tested microorganisms and compare with the half McFarland their turbidity, to the extent that they are half McFarland. Then, with a micropipette of 2.5 microns from the lagoon, remove the bacteria on the plates, and finally place the plates in the incubator for 24 hours, and the next day the results are read.

Conclusions: After making nanoparticles and investigating nanostructures on bacterial strains, we found that 32 μ g/ml of nanoparticles prevents the growth of bacteria in the control.

Key words: Nanostructures, $Ag_2S/PbSO_4$ Nanocomposites, Antibacterial Properties, Gram Positive and Negative Bacteria