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Ecological Synthesis and categorization of Silica Nanoparticles employing Bacillus thuringiensis with Nanomaterials.

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Abstract

The current research examines the biological manufacture of silver nanoparticles (Ag NPs) utilizing Bacillus thuringiensis. The minimum inhibitory concentration (MIC) test was used to determine the inhibitory concentration of AgNO3 against Bacillus thuringiensis and Bacillus subtilis. By using a green synthesis approach, silver nanoparticles were effectively manufactured from Bacillus thuringiensis. UV-visible spectroscopy, scanning electron microscopy (SEM), X-ray diffraction (XRD), and FTIR were used to characterize the Ag NPs in detail. The absorption peak was located at 420 nm using UV-visible spectroscopy. The SEM pictures demonstrate the presence of spherical silver nanoparticles in the sample. The silver nanoparticles are crystalline in nature, as evidenced by the FT-IR peak at 518 cm-1 matching to the Ag vibration seen in crystalline structure. Finally, the antibacterial activity of silver nanoparticles was tested using the spread plate technique, and it was discovered that silver nanoparticles are more effective against S. aureus and B. subtilis than E. coli.

Keywords:

Nanomaterials Silica Nanoparticles SEM UV-visible spectroscopyAntibacterial activity