

## **In-Vitro and Antibacterial Studies for Silicate-Phosphate Glasses Formed with Biosynthesized Silica**

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**Abstract :** In the present research, bio-synthesis of silica particles has been carried out successfully. For this purpose, agriculture waste rice husk (RH) has been utilized. Among several types of agriculture waste, RH is considered to be cost-effective and easily accessible. In the present investigation, a chemical approach has been followed to extract silica nanoparticles. X-Ray Diffraction (XRD) patterns indicated the amorphous nature of silica at lower temperature range. Silica and other mineral contents have been found using energy dispersive spectroscopy (EDS). Morphological and structural studies have been carried out with the use of Field Emission Scanning Electron Microscopy (FE-SEM) and Fourier Transform Infrared Transmission (FTIR) spectroscopy. Further, extracted silica from RH has been used for preparation of the glasses. The appearance of broad humps in XRD patterns confirmed the amorphous nature of prepared glasses. These glasses exhibited enhanced antibacterial effect against both Gram-positive and Gram-negative bacteria. The as-synthesized glass samples can be further used for physical and structural studies for drug loading applications.

**Keywords :** rice husk, biosynthesized silica, bioactive glasses, antibacterial studies

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