

## Characterization and Comparative Analysis of North Bengal Sand

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**Abstract :** This paper presents results of the investigation on the characterization of silica sand of northern region of Bangladesh on the basis of material composition, particle shape, and size, density, transportation, crystallinity, etc. before and after upgradation. The raw sand samples collected from Nilphamari and Lalmonirhat district were studied and compared for the prospect silica as a high valued commodity rather than heavy minerals. The raw sand particles were colorful in appearance with varying particle size distribution. Scanning Electron Microscopy (SEM) showed uniformity in grain size and mineralogical composition. X-ray fluorescence (XRF) analysis indicated the silica content of the as-received sample to be 75%. Thermogravimetric and Differential Thermal Analysis (DTA) did not detect the presence of any organic material. These tests revealed the sample to be alpha-quartz. Samples were washed with organic and inorganic acid with a combination of varying rotation speed, concentration, solid-liquid ratio. Experiments showed the silica content could be enhanced to more than 85% by washing with 15% sulphuric acid in room temperature. Beneficiation can be improved in further work considering the effect of varying temperature or advanced technology.

**Keywords :** beneficiation, characterization, commercial grade sand, glass sand, silica, upgradation

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