

Client: PURE BIOKEYZ AUST - ASP+ FOSSIL-POWER
Job number: 19_1152
Sample: 19_1152
Client ID: ED-FP23
Date: 17/06/2024
Analysis: Crystalline and Amorphous Silica

Sample preparation

The sample was lightly ground in a mortar and pestle to ensure a particle size with 100% passing 20µm. This helps to minimise erroneous specimen effects in the XRD patterns obtained. The specimens were run in a Philips X'Pert PW3710 X-ray diffractometer using a cobalt X-ray source. The sample was run initially as received to confirm silica species present then separate sub-samples were prepared. One sub-sample was spiked with an internal reference standard (corundum) and another was calcined at 1100°C for 6 hours to convert any amorphous silica present to crystalline silica phases. The calcined sub-sample was then also spiked with an internal reference standard (corundum). Both of these sub-samples were then loaded, and these specimens run as complete semi-quantitative XRD analysis scans.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was EVA 4.2. An up-to-date ICDD card set was used.

The concentrations of crystalline silica were determined using the internal reference standard calibration in the as received sample. The calcined sub-sample was assessed for increases in crystalline silica concentrations using the internal reference standard calibration. The increased crystalline silica concentrations were assumed to have come from amorphous silica sources and all of the amorphous silica present in the as received sample was converted to crystalline silica phases. Assumed densities were used for the various silica phases.

Summary

The results for the as received sample were determined to be:

Lab ID	Client ID	Crystalline Silica (mass %)	Amorphous Silica (mass %)
19_1152	ED-FP24	0.05	97.1

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