

PaGe_010_HydroWeigh-Archimedes_MgO-C_GraphiteNFL_1000°C

Date: 2026-08-05

Tags: MgOC GRK2802_DFG_461482547

Archimedes Sintered

Category: Testing & Analysis

Status: Success

Created by: Patrick Gehre

Team: Institute of Ceramics, Refractories and Composite Materials

Objective:

- Evaluation of bulk density and apparent porosity of pressed MgO-C samples with 1.1 wt.-% graphite NFL.

Experimental setup:

- Raw material mixture from [Processing - PaGe_002_Mixing_MgO-C_GraphiteNFL](#)
- Pressing [PaGe_005_Pressing_MgO-C_BiomassPellets_120MPa](#)
- Thermal treatment [Processing - PaGe_006_ThermalTreatment_MgO-C_BiomassPellets_1000°C](#)
- Hydrostatic weighing was performed according to EN 993-1 using [Device - Archimedes Density Apparatus \(ArchimedesDensityTester\)](#) with toluol as immersion liquid.

Procedure :

1. Determining the toluol temperature (used for estimating the toluol density: 0.8668 g/cm^3)
2. Weighing the samples in a dry state
3. Weighing in wet (soaked with toluol) state, "surface dry"
4. Weighing submerged in toluol
5. Drying the samples at $110 \text{ }^\circ\text{C}$ for 24 h

Details about the exact procedure can be obtained from EN 993-1.

Results:

Mass 1, mass 2, and mass 3 to calculate the apparent porosity and density.

elabExperiment Metadata - Contextualize data (storage structure, formats, and how the stored data correspond to experimental activities)

Format

Format of the generated raw, (processing) meta, processed and result data

PDF, TXT, CSV, XLSX; The data are stored in four subfolders: 0_Documentation/ (additional documentation) 1_RawData/ (direct experimental output), 2_ProcessedData/ (data derived from raw), and 3_EssentialData/ (features derived from processed). Generation metadata are included in the raw data file.

Coverage

Fraction/part of the experiment contained in the generated raw and result data

The data set covers the hydrostatic weighing data and the resulting density and porosity values of the selected MgO-C specimens. For each specimen, the dry mass, toluol-soaked mass, and immersed mass in toluol were recorded using the Archimedes Density Apparatus according to EN 993-1.

Description

Brief description to understand and navigate the generated raw, processed, meta and result data of the conducted experiment

This experiment documents the determination of bulk density and apparent porosity of thermally treated (hardened and carbonised at 1000 °C) MgO-C reference samples with 1.1 wt.-% graphite NFL cut in fractures based on bar-shaped specimens. 1_RawData-Folder contains the determined masses. 2_ProcessedData contains the calculated values for bulk density, apparent porosity and toluol absorption using the toluol density derived from the temperature as well as the obtained mean values. 3_EssentialData contains the reprocessed values for further use.

Contributors

Persons who contributed to data generation (forename name; forename name; etc.)

Patrick Gehre; Magzhan Kapessov

Linked experiments

Processing - [PaGe_002_Mixing_MgO-C_GraphiteNFL](#)

Processing - [PaGe_005_Pressing_MgO-C_BiomassPellets_120MPa](#)

Processing - [PaGe_006_ThermalTreatment_MgO-C_BiomassPellets_1000°C](#)

Linked resource

Device - [Archimedes Density Apparatus \(ArchimedesDensityTester\)](#)



Unique eLabID: 20260805-6b9f8f1795524dccade0c9779b55c35365c60031

Link: <http://elabftw.chemie.tu-freiberg.de/experiments.php?mode=view&id=6275>