Martin-Luther-Universität Halle-Wittenberg
Institut für Geowissenschaften
FG Mineralogie/Geochemie

Prof. Dr. Dr. H. Pöllmann
Von-Seckendorff-Platz 3, 06120 Halle,
Tel.: +49/345/5526110 Fax:.+49/0345/5527180

e-mail: herbert.poellmann@geo.uni-halle.de

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PANalytical EMPYREAN

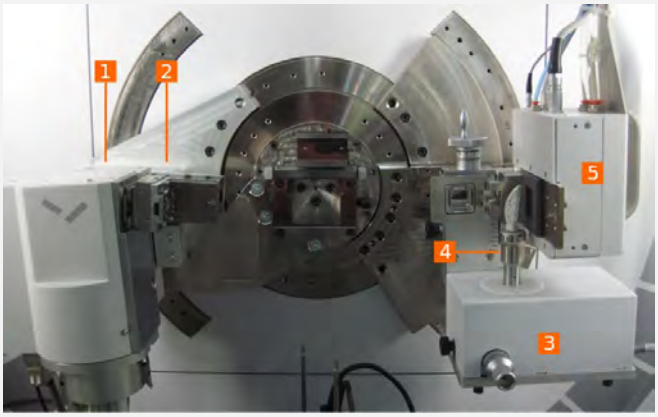
Computed Tomography (CT)

The PANalytical EMPYREAN X-ray diffractometer is equipped with a Mo-tube (/Cu-tube), a rotational sample stage for CT and a state of the art detection system, the GaliPIX^{3D}, that is capable of collecting frames suitable for 3D processing in computed tomography.

CT offers the possibilty to **analyze and visualize different features** (e.g. amount/type/connectivity of pores, cracks, inclusions, mineral distribution, preferred orientations, wall-thickness, surface area) **in a fast and non-destructive way through 3-dimensional virtual reconstructions of the sample**.

Applications: Building materials, ceramics, composite compounds, foams, electronics, rocks.

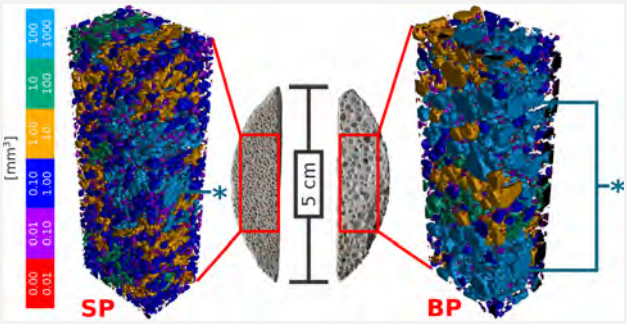
Experimental Setup - Overview

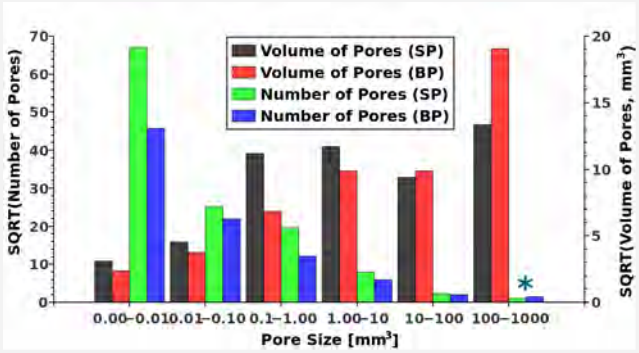


1) Mo- or Cu-tube in point focus
2) incident beam optic & filter
3) CT rotational sample stage
4) sample holder with sample
5) GaliPIX^{3D} detector

Experimental parameters (anode material, voltage/current, filter materials, rotation range, step size, time per step, PHD levels) can be adjusted according to the sample.

Example: Autocalved Aerated Concrete





The **3D pore-size(-volume) distribution** (which has an influence on strength, permeability, density, thermal insulation, etc.) **can be determined and visualized with CT on a laboratory X-ray diffractometer**.