**Multipurpose X-ray powder diffractometer**

**Equipment:** multipurpose X-ray powder diffractometer PANalytical XPertPRO

**No. of Equipment**: UACH14

**Responsible coordinator:** Dr. Petra Ecorchard

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**Equipment Description**

**Description of equipment:**

multipurpose X-ray powder diffractometer (PANalytical XPertPRO)

**More detailed specifications and features**:

* Cu or Co radiation
* Bragg – Brentano reflection geometry
* transmission geometry
* micro-diffraction (mono-capillary exit diameter of 100 microns, spot size of about 120 microns on the surface of sample)
* in-situ high temperature XRD (up to about 1200 deg. C)

**Specification of expertise relevant to NanoEnviCz workpackages:**

**WP3**a,c-h, **WP4**a,b, **WP5**c, **WP6**a,c-f, **WP7**a-c,h

**Detailed description of expertise**

**Please, specify the main research topics connected with equipment**:

Qualitative and quantitative phase analysis of any crystalline phases

In-situ structural transformations at elevated temperature

Micro-diffraction of small heterogeneous solid samples with complicated stratigraphy

**Please, specify the secondary research topics connected with equipment**:

Analysis and quantification of clay-based materials, of various clinker or concrete materials.

**Keywords describing research area:**

**X-ray powder diffraction, X-ray powder micro-diffraction, quantitative phase analysis, qualitative phase analysis**

**Competence**

**Relevance for applied and industrial research:**

Non-destructive analysis, qualitative and quantitative phase analysis of crystalline solids, determination of amorphous content by indirect method using an internal standard addition.

Studies of changes in materials connected with their applications, usage, functionality.

Studies of changes in materials caused by ageing, fatigue at operation conditions.

**Relevance for fundamental studies:**

Studies of phase transformations at elevated temperatures that could lead to elucidation of their mechanisms. Direct comparison with methods of thermal analysis (could be complementary each other)

Studies of changes of physical and structural properties of materials connected to doping, reaction pathways etc..