

# Quantitative mineralogy and bulk rock geochemistry of the Permian Kupferschiefer system, Saale subbasin, Eastern Germany

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## 2. Citation

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## Table of Contents

1. Licence .....	1
2. Citation.....	1
3. Data description.....	2
3.1 Sampling method.....	2
3.2. Analytical procedure.....	2
3.3. Data processing.....	2
4. File description.....	3
5. References .....	3

### 3. Data description

The Southern Permian Basin in Central Europe (in Germany and Poland) hosts several sediment-hosted Cu deposits (see Borg et al., 2012). The Cu- and Zn-Pb sulfide mineralization is preserved in the coarse-grained continental siliciclastics of the uppermost Rotliegend (S1), organic matter- and carbonate-rich marine mudstones of the Kupferschiefer (T1) and dolomitic Zechstein Limestone (Ca1). In these datasets, we provide quantitative mineralogical and geochemical data of drill core samples from the Saale subbasin in East Germany. The samples include the uppermost Rotliegend sandstone (S1), Kupferschiefer (T1) and lowermost Zechstein Limestone (Ca1), referred as the Kupferschiefer system, from three drill cores (Sangerhausen, Allstedt and Wallendorf).

This data publication includes quantitative mineralogy (X-ray diffraction), bulk rock major, minor and trace element geochemistry (X-ray fluorescence and inductively coupled mass spectrometry) and total organic carbon (elemental analyzer).

#### 3.1 Sampling method

Three drill cores were accessed from the core repository of *Landesamt für Geologie und Bergwesen, Sachsen-Anhalt* and transported to GFZ for sampling and microscale observation. These drill holes intersect the Rote Fäule and Cu zone (Sangerhausen, SHN) and the overlapping Zn-Pb zone (Wallendorf, WDF and Allstedt, AST). From the three drill holes, a total of 47 samples (SHN =17, AST = 17 and WDF = 13) were collected, each sample with sampling interval of every ~5 cm. Each sample were split in to two, for thin and thick sections for petrography and powdered sample for quantitative mineralogy and geochemistry.

#### 3.2. Analytical procedure

All the analyses were done at the Elements and Minerals of the Earth Laboratory (EIMiE-Lab) located at the GFZ German Research Centre for Geosciences in Potsdam (GFZ). Samples were crushed to <62 µm size and split for mineralogy and geochemistry. Powdered samples further micronized in to <10 µm size for quantitative mineralogy and analyzed using X-Ray diffraction. Major and minor elements were determined on glass beads on <62 µm powdered sample split and analysed by X-ray fluorescence (XRF) using an Axios Advanced spectrometer. For trace element analysis, samples were digested using the standard four-acid digestion method and analyzed using inductively coupled mass spectrometry. The total sulfur (S), total carbon (TC) and total organic carbon (TOC) contents were analysed with an elemental analyser.

#### 3.3. Data processing

The mineralogy was determined with the software *EVA* (version 11.0.0.3) by Bruker. Rietveld refinement for quantitative mineralogy was performed using the program *BGMN* (Bergmann et al., 1998) and the open-source software package *Profex* (Doebelin and Kleeberg, 2015). The error is in the range of 3 %. For the geochemical analysis blanks and certified reference materials were analyzed for data quality. One procedural blank is included per 18 samples and was generally negligible compared to sample concentrations. Acid blanks are subtracted online. Measurements were repeated 2-4 times with repeatability generally within 5 %. The reproducibility for replicate analyses for total carbon and total organic carbon was better than 0.2 wt. %

## 4. File description

The two files stored in the zipped folder “2022-006\_Mohammedyasin-et-al\_Data.zip” are the data description and the data files. All the quantitative mineralogy, bulk rock geochemistry and total organic carbon data are presented in the data file. The data file includes five tables in one excel file: 1. data source, 2. sample information, 3. data, 4. primary analytical metadata and 4. method-specific metadata.

## 5. References

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