

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description:

This file contains data underpinning the main results for Sample A. They can be downloaded as zip-file with the title “Supplementary Data 1.zip”.

Upon extraction, a folder entitled “**Sample_A**” is generated. This main folder contains a text file entitled “**Units_in_2D_maps.txt**” and **one sub-folder entitled “Fig_3”**. The text file provides the units for 2D maps contained in the sub-folder. Sub-folder “Fig_3” contains data related to sample A, its name indicating the manuscript figure featuring the relevant plots. Within this folder, there are **five 2D XFM maps** in the form of uncompressed 32-bit tiffs (the default format used for all other 2D maps in this contribution) for the elements **Ca, Fe, Sr, and Zr**, as well as **Compton scattering** intensity. Moreover, there are three text files. The file named “Pixel_size.txt” gives the physical pixel size of the 2D maps. The files entitled “Ca_profile.txt” and “Fe_profile.txt” provide the data needed to plot the dimensionless concentration profiles shown in Fig. 3b.

File Name: Supplementary Data 2

Description:

This file contains the first part of data for Sample B presented in Figure 4. Upon extraction, a folder called “Fig_4_part1” is generated.

Within this folder, there are **two 2D XFM maps** (uncompressed 32-bit tiffs) for the element **Ca** and **Compton scattering** intensity. Moreover, there are four text files. The file named “Pixel_size.txt” gives the physical pixel size of the 2D maps. The files entitled “Ca_profile.txt” and “Fe_profile.txt” provide the data needed to plot the dimensionless concentration profiles shown in Fig. 4b. The text file “Units_in_2D_maps.txt” provides the units for 2D maps.

File Name: Supplementary Data 3

Description:

This file contains the second part of data for Sample B presented in Figure 4. Upon extraction, a folder called “Fig_4_part2” is generated.

Within this folder, there are **three 2D XFM maps** (uncompressed 32-bit tiffs) for the elements **Fe, Si, and Ti**. The text file “Units_in_2D_maps.txt” provides the units for 2D maps.

File Name: Supplementary Data 4

Description:

This file contains data for Sample B presented in Figures 5 and 6. Upon extraction, a text file entitled “**Units_in_2D_maps.txt**” and **two folders entitled “Fig_5” and “Fig_6”**, respectively, are created. The text file provides the units for 2D maps contained in the sub-folder. The folders relate to the respective manuscript figures and feature the following content.

a) Fig_5

Within this folder, there are **five 2D XFM maps** (uncompressed 32-bit tiffs) for the elements **Ca, Fe, Si, Ti,** and **Compton scattering** intensity. Moreover, one 32-bit tiff-file contains the **2D ptychogram** (Fig. 5f, filename 37136_PTY.tiff). The only text file named “Pixel_size.txt” gives the physical pixel size of the 2D maps.

b) Fig_6

This folder contains three text files needed to generate all plots in Fig. 6. File “Fig6a.txt” contains the two data columns required to generate Fig. 6a. Fig. 6b contains histograms of both columns, which can be derived from the raw data in “Fig6a.txt”. “Fig6c.txt” features the data (two columns) underpinning the scatter plot in Fig. 6c. “Fig6d.txt” contains one column with all micro-dissolution seam width data obtained from our scanline analysis. It can be used to regenerate Fig. 6d.