

SURFACE CHARACTERIZATION OF AUSTRIAN DAGUERREOTYPES

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INTRODUCTION

The Heritage Science project PHELETYPIA, "The impact of early photography and electrotyping media on the creation of images and contemporary art", funded by the Austrian Academy of Sciences, is researching original Austrian daguerreotypes. The aim is to gain detailed information about the special photography methods developed in the early 1840s in Vienna.

Collections throughout Austria [1-2] and abroad are contacted and a selection of daguerreotypes are examined for their special surface properties. The main goal is to collect data about the chemical and morphological characteristics and properties of Austrian daguerreotypes and to draw conclusions about the production methods.

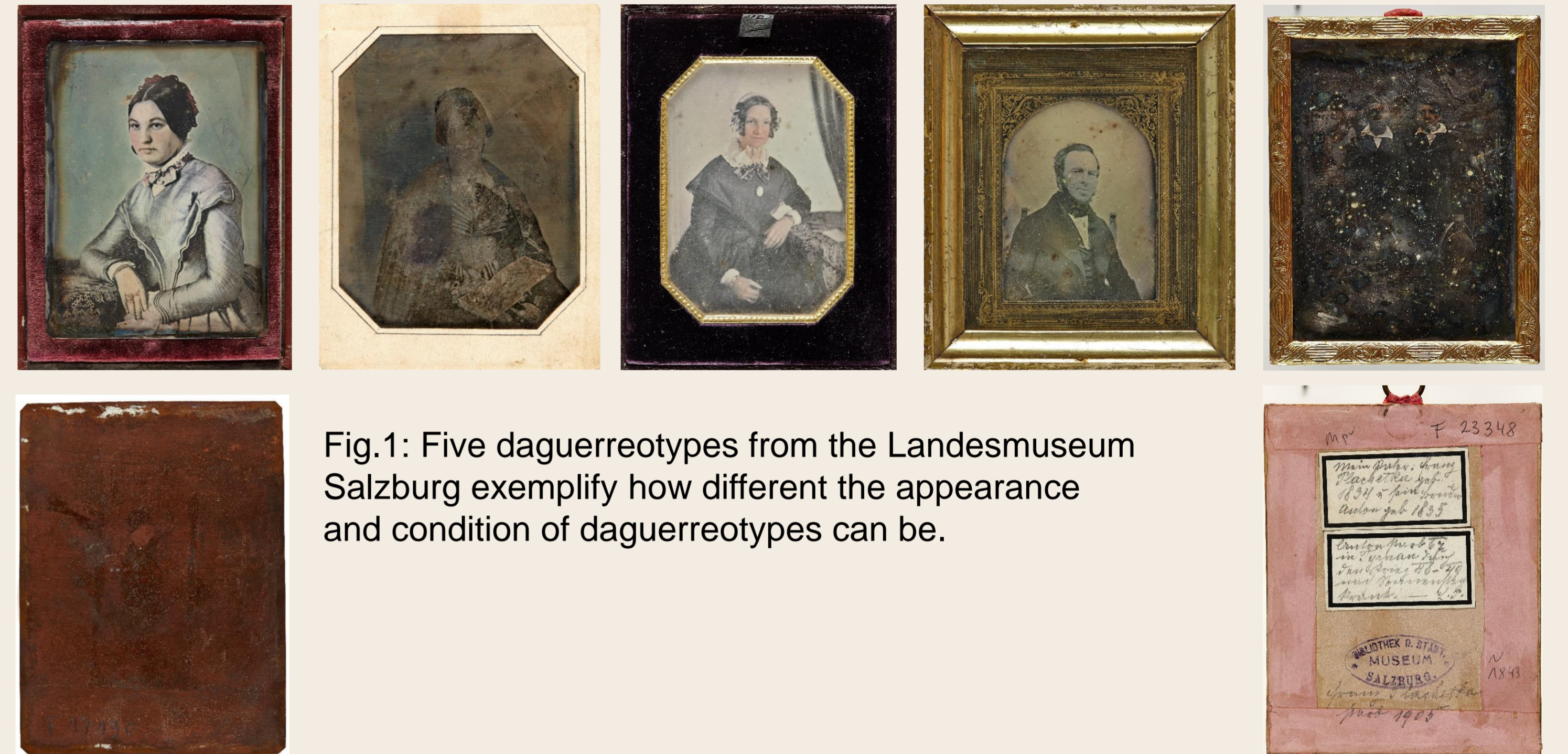


Fig.1: Five daguerreotypes from the Landesmuseum Salzburg exemplify how different the appearance and condition of daguerreotypes can be.

EXPERIMENTAL & RESULTS

The surface morphology and surface chemistry of daguerreotypes are the most important sources of information related to their production methods and the corrosion and aging processes affecting their long-term preservation [3-4].

In this context, it is indispensable to characterize the surface of original daguerreotypes with ultimate resolution and sensitivity. Three non-destructive and non-contact examination methods were identified to be the standard for analyzing the daguerreotypes in this project:

- Digital optical microscope (HIROX RH-2000 3D)
- Scanning electron microscope with an atomic force microscope (SEM/EDX, FEI Quanta 250 FEG)
- Micro-X-Ray fluorescence (XRF, Rh-anode 40 kV, 0.1 mA, with Ag-filter, flushed with He)

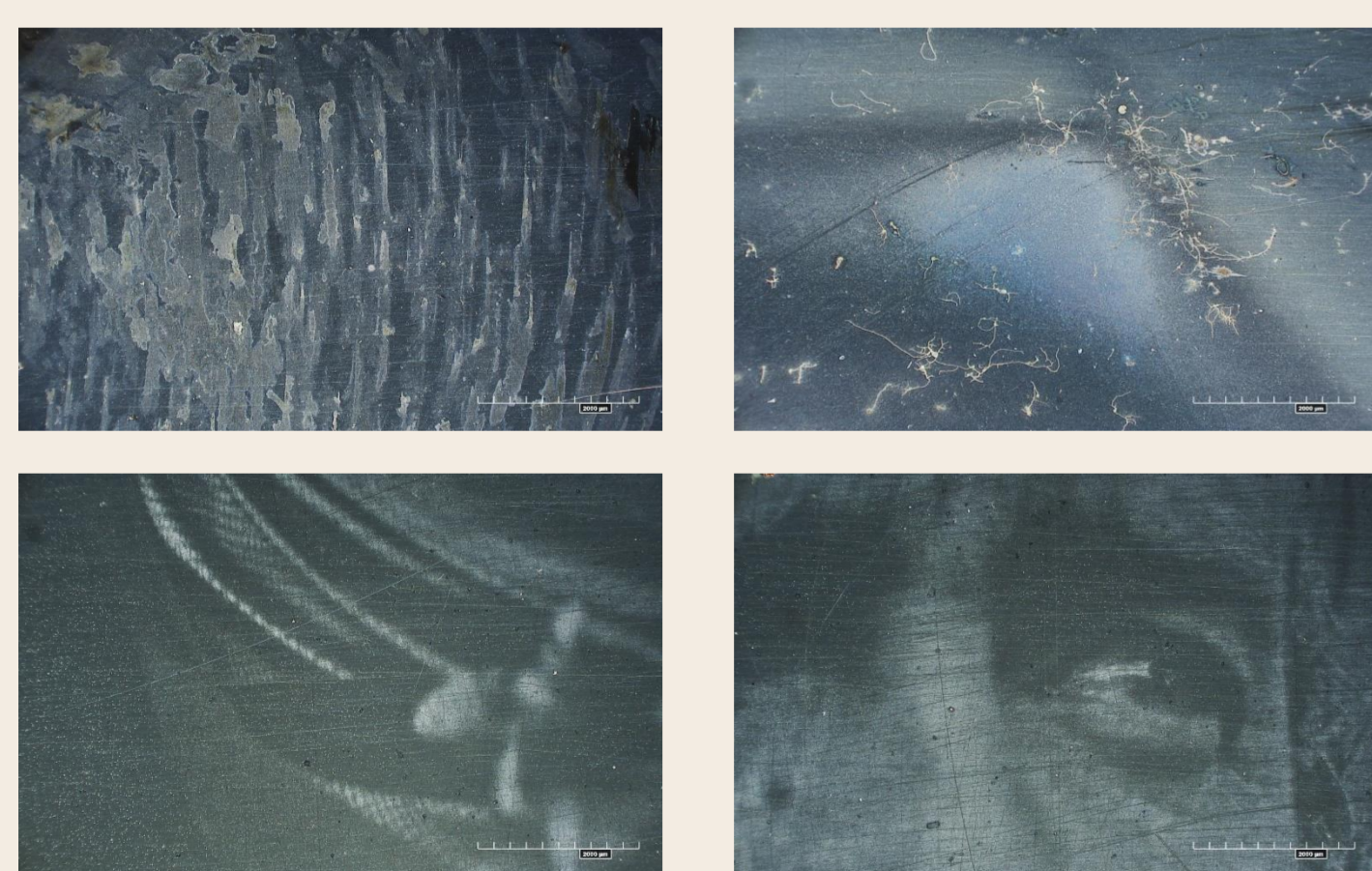


Fig.2-5: Top left: Fingerprint. Top right: mold growth in the edge area. Bottom left: detail from collar. Bottom right: eye area. Portrait of Dr. Adolf Gaggl, 1841, Landesmuseum Klagenfurt.



Fig.6: Digital optical microscope (HIROX RH-2000 3D).

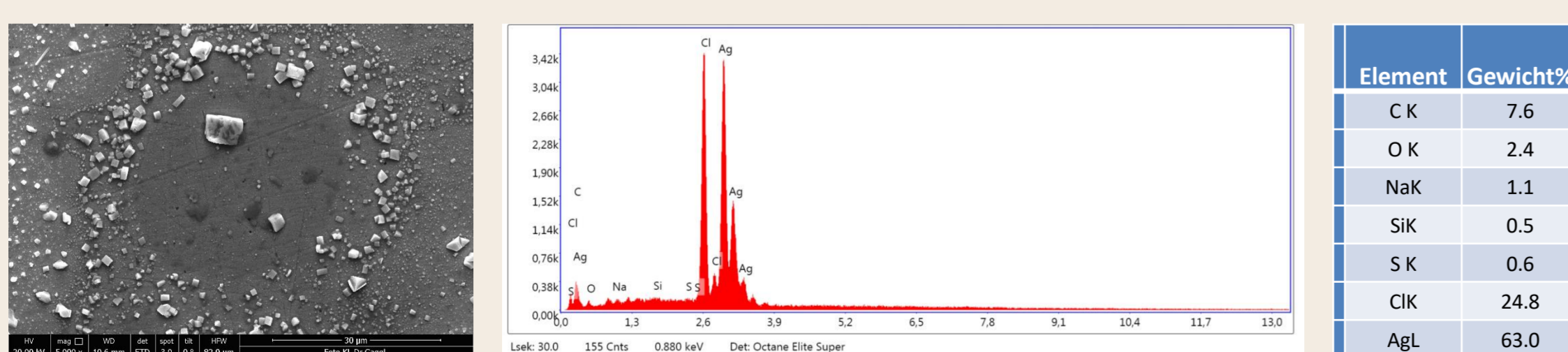


Fig.7: SEM image of a detailed area in the fingerprint with EDX elemental analysis. Portrait of Dr. Adolf Gaggl, 1841, Landesmuseum Klagenfurt.



Fig.9: Daguerreotype, Portrait of Dr. Adolf Gaggl, 1841, Landesmuseum Klagenfurt.

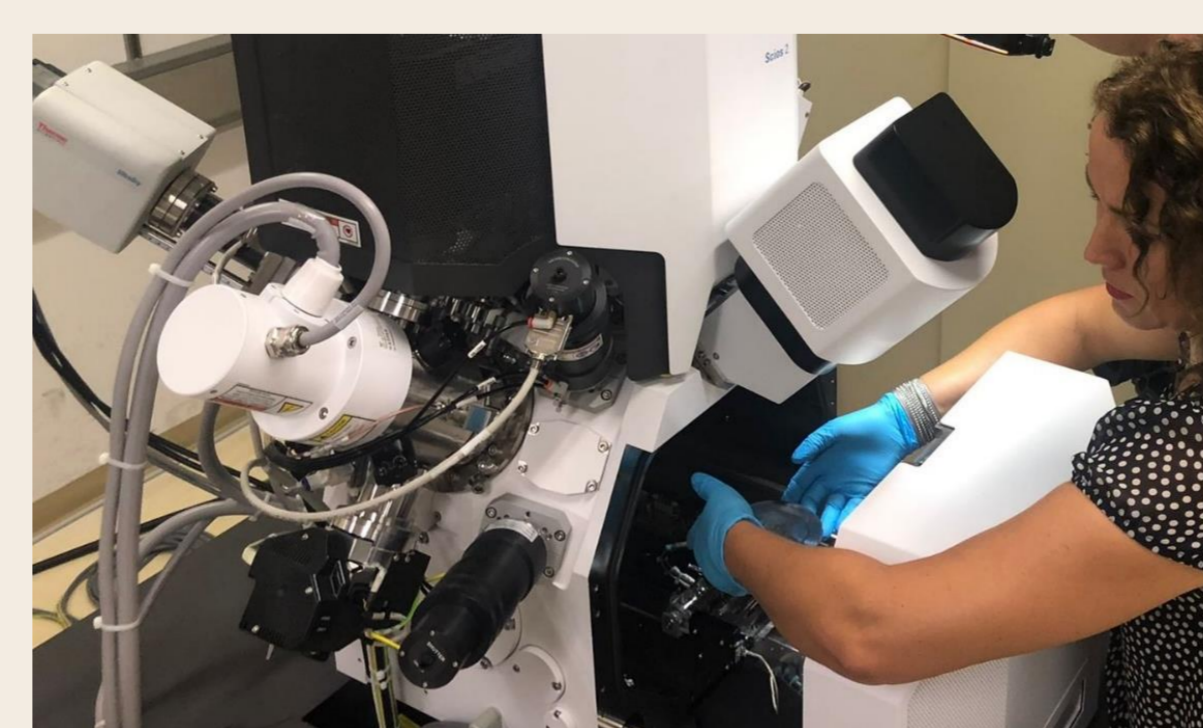


Fig. 8: Cautious placement of the daguerreotype in the sample chamber of the scanning electron microscope (SEM/EDX).

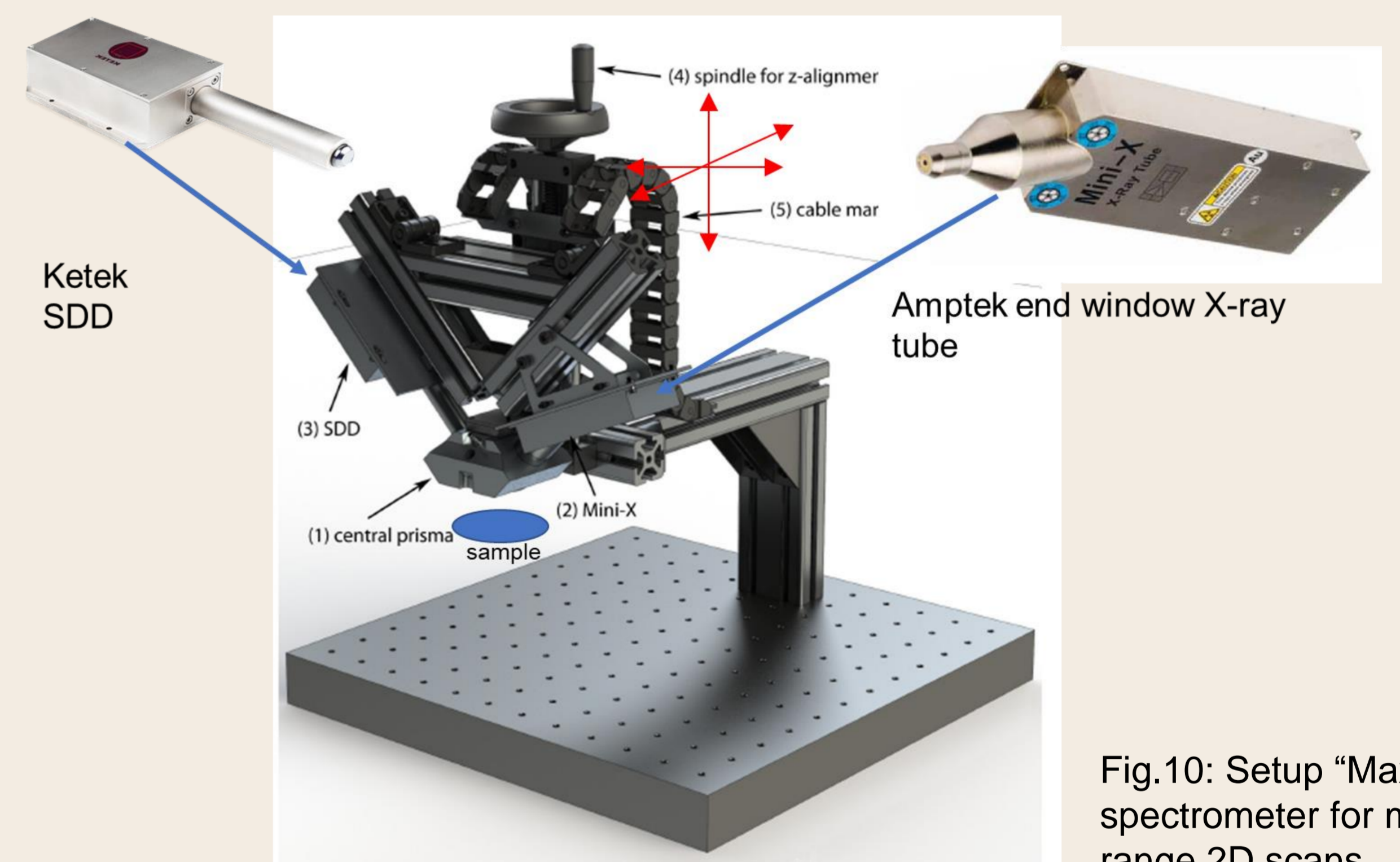


Fig.10: Setup "Maxi" spectrometer for mm-range 2D scans.

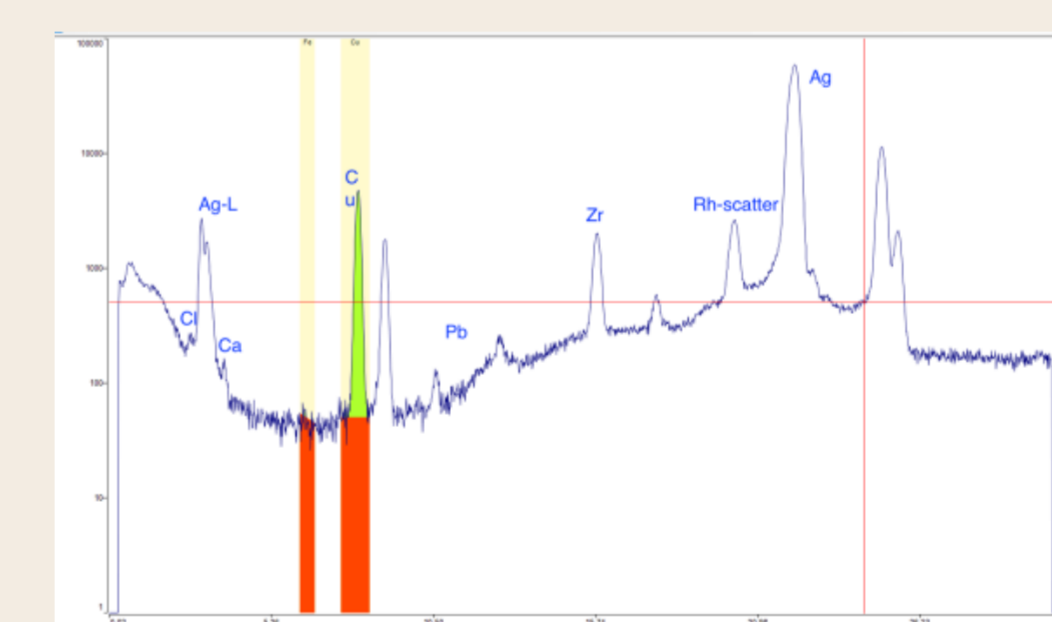


Fig.11: Micro-XRF spectrum of the brighter background area on the right side of the portrait of Dr. Adolf Gaggl, 1841, Landesmuseum Klagenfurt. Flooded with He; measurement duration of 300s.

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