

## SUPPLEMENTARY INFORMATION

### **Illuminating Prussian Blue fading in oil paintings: a multi-scale and multi-technique approach to mitigate synchrotron radiation X-ray induced iron photoreduction**

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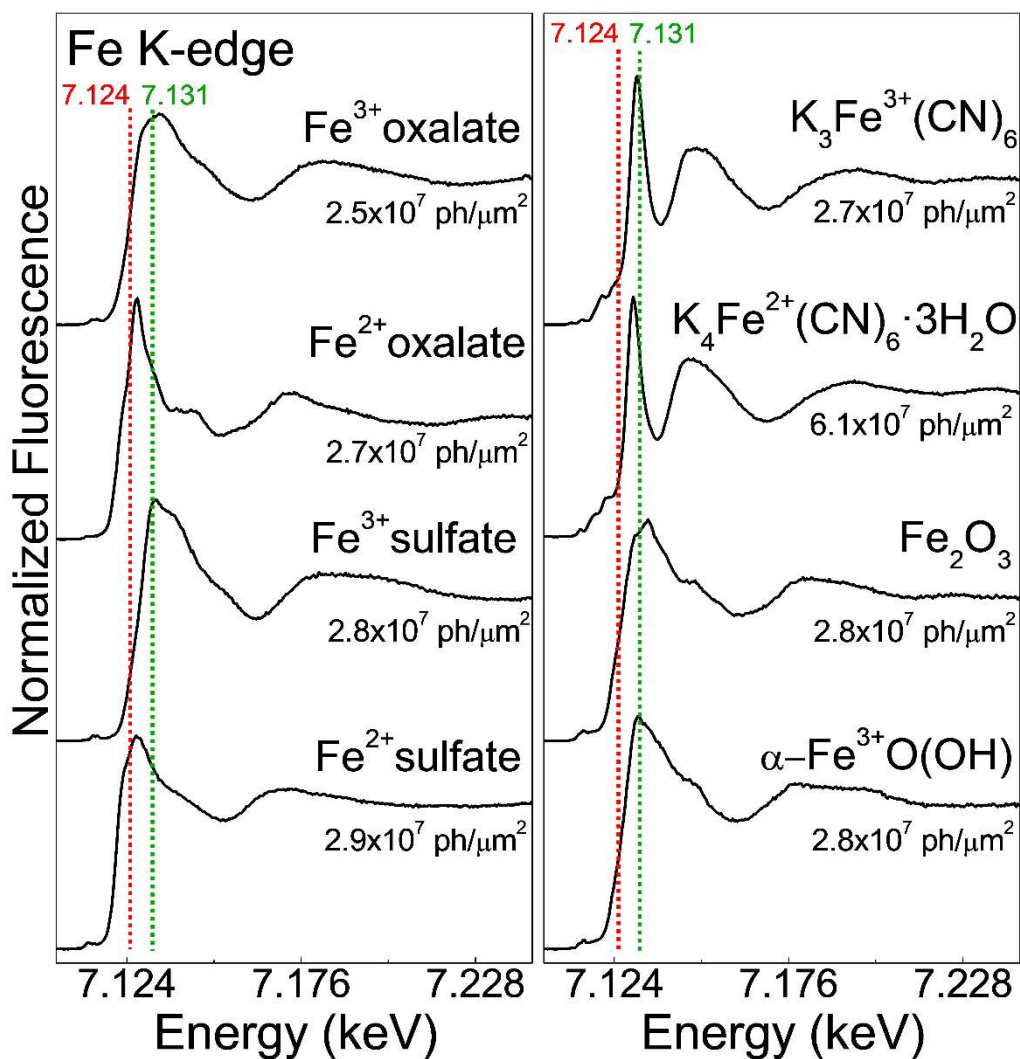
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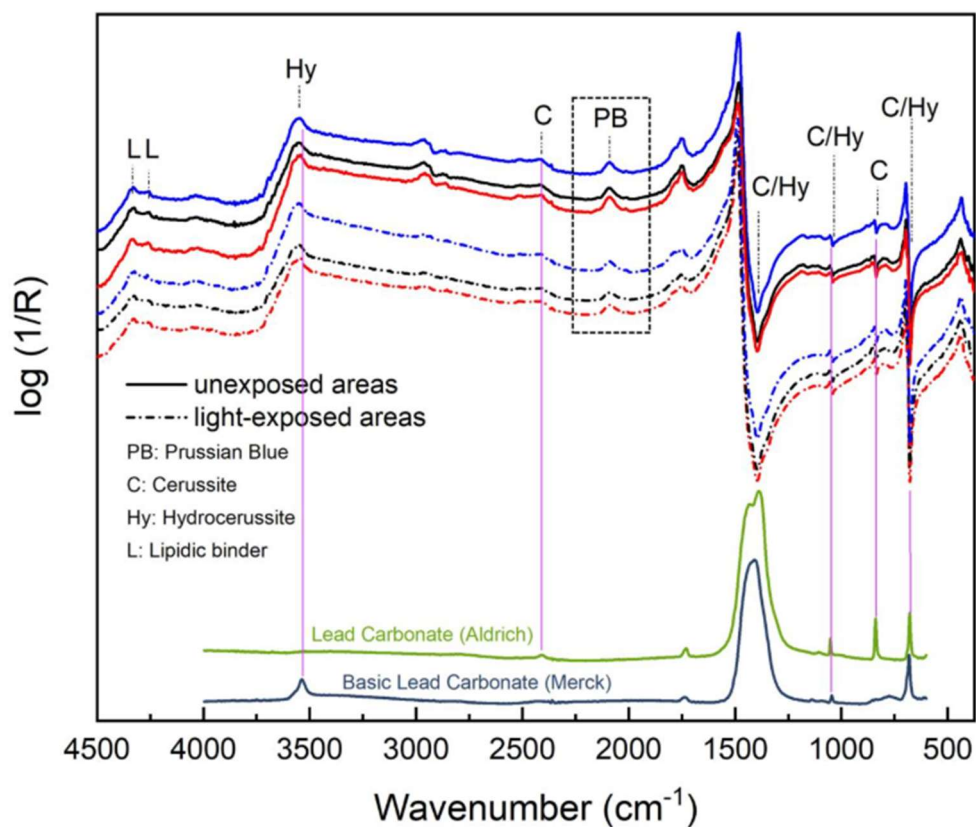
[david.but@cnr.it](mailto:david.but@cnr.it)

### S1. Fe K-edge XANES spectra of iron reference powders



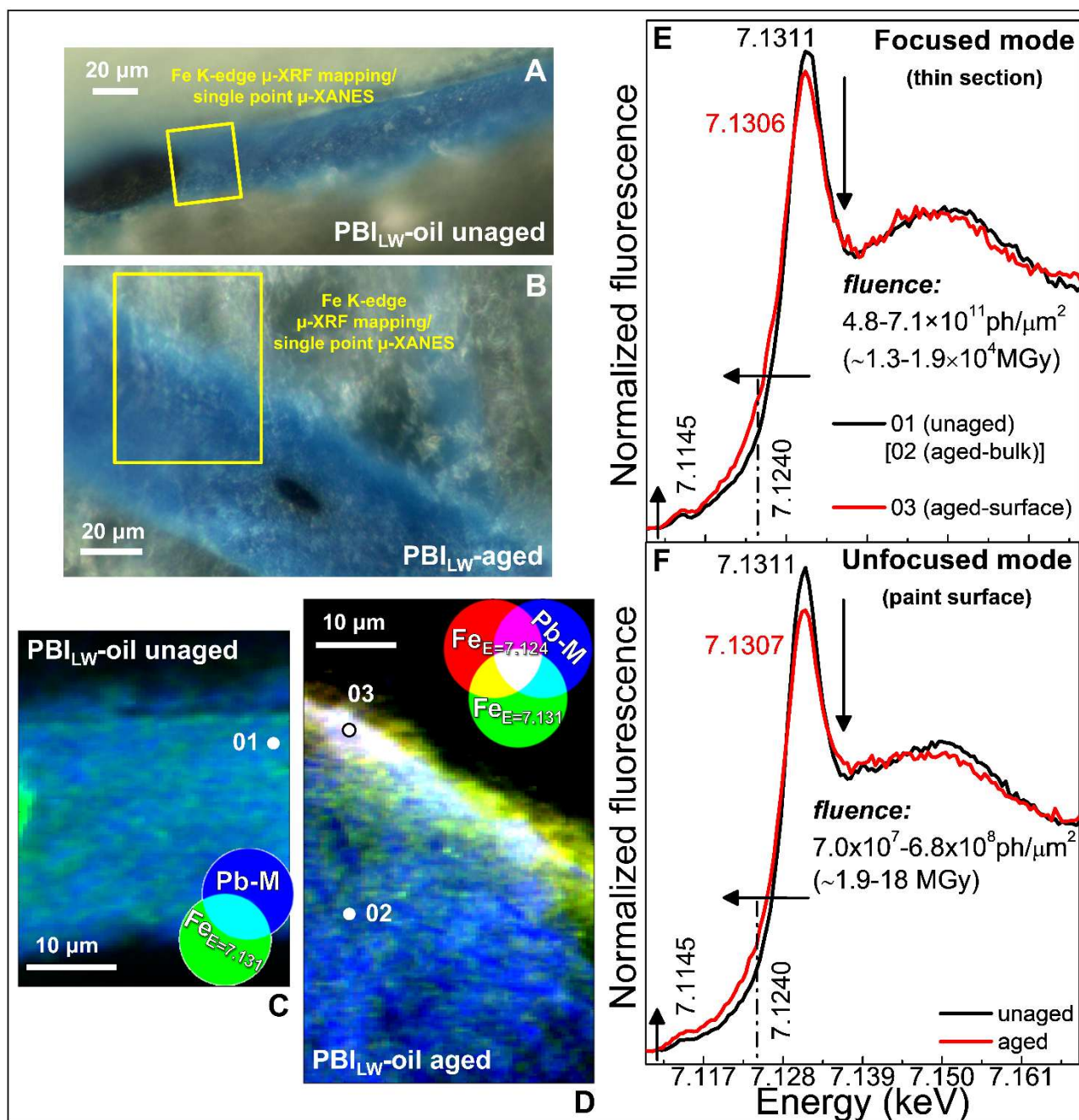
**Fig. S1.** Fe K-edge XANES spectra acquired in unfocused mode from a set of Fe-based reference powders. The red and green lines show two the energies selected to perform the  $\mu$ -XRF mapping at selected energies around the Fe K-edge (see the main paper: Experimental section, par. 2.3.4 ).

## S2. Non-invasive FTIR reflection spectra of Abildgaard's painting



**Fig. S2.** FT-IR reflection spectra of unexposed (solid line) and light-exposed (dot-dashed line) areas collected from cleaned area no. 1 (see main paper for reference) compared with transmission spectra of cerussite and hydrocerussite. Different colors of reflection spectra correspond to different pairs of light-exposed/unexposed measurements. Spectra have been vertically offset for clarity.

**S3. Fe K-edge  $\mu$ -XANES/  $\mu$ -XRF investigations of unaged and artificially photoaged “insoluble” Prussian blue -lead white oil paint mock-ups**



**Fig. S3.** Photomicrographs of “insoluble” Prussian blue-lead white (Pb<sub>LW</sub>) thin sections (A) before and (B) after UVA-visible aging. (C,D) RGB composite SR  $\mu$ -XRF images of the mock-ups, showing the Pb-M map recorded at E=7.3 keV (blue) and the Fe distribution acquired at energies below (red) and above (green) the K-edge. Maps were collected from the areas shown in (A,B) [Pb<sub>LW</sub>-unaged: step size (h $\times$ v): 0.5 $\times$ 0.3  $\mu\text{m}^2$ , exp. time: 100 ms per pixel, fluence: 3 $\times 10^9$  ph/ $\mu\text{m}^2$  per pixel; Pb<sub>LW</sub>-aged: step size (h $\times$ v): 0.5 $\times$ 0.3  $\mu\text{m}^2$ , exp. time: 100 ms per pixel, fluence: 5 $\times 10^9$  ph/ $\mu\text{m}^2$  per pixel]. Selection of Fe K-edge XANES spectra acquired from the unaged/unexposed (black) and photoaged (red) mock-ups and collected (E) in focused mode from the spots of the thin sections shown in (D,E) and (F) in unfocused mode from a selective sampling of the paint surface.