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High Definition X-ray Fluorescence Elemental Mapping of Historic Photographs

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In the 19th century, photography rapidly advanced with the continuous development of light-sensitive chemical-based processes. As such, some photographic processes were in use for less than a decade before being rendered obsolete. Some of these historic processes are sensitive to image degradation, and many photographic images are considered lost due to severe fading.

We have non-destructively analysed several historic photograph types at the X-ray fluorescence microscopy beamline of the Australian Synchrotron to investigate the spatially resolved elemental distributions and their relationship to image permanence and the photographic processes used. The analysis also tested the hypothesis that besides providing chemical information about the photographs, image retrieval is also possible. We propose that scanning X-ray fluorescence methods may prove practical in recovering images that are faded beyond recognition.

Keywords

X-ray fluorescence elemental mapping imaging photographs

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