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A new protocol for fingerprinting cultural ochre sources using mineral magnetism

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Provenance studies in ochre research are used to characterise the “fingerprint” of different ochre sources, providing the opportunity to trace the cultural movement of ochre in the archaeological past. Ochre pigment composition, and therefore the “fingerprint”, often varies between sites leading to source discrimination, but in many cases the composition can also vary within a site, and therefore presents an analytical challenge to develop methods that can differentiate this “fingerprint”. This work presents a novel protocol for the analysis of iron-based archaeological ochres from known sources within Australia and Kenya using geological mineral magnetism methods to disentangle complex mineral assemblages¹. Magnetic properties have been largely unexplored as a tool for ochre provenance. However, the use of measurements such as room temperature – saturation isothermal remnant magnetisation (RT-SIRM), Hysteresis loops and zero field cooled, field cooled (ZFC-FC) allow for the identification of different magnetic minerals in the ochre samples, which can, in turn, be used to fingerprint ochre sources. This approach works towards understanding (1) the variation within and between sites and how this may differ based on source geologies and (2) the larger goal of tracing the movement of ochre from their sources to archaeological contexts and related ochre cultural exchange.

(1) Lagroix, F.; Guyodo, Y. A new tool for separating the magnetic mineralogy of complex mineral assemblages from low temperature magnetic behavior. *Frontiers in Earth Science* **2017**, *5*, 61.