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### Data Article

# Characterisation of mineral deposition systems associated with rock art in the Kimberley region of northwest Australia



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#### ABSTRACT

This data article contains mineralogical and chemical data from mineral accretions sampled from rock art shelters in the Kimberley region of north west Australia. The accretions were collected both on and off pigment and engraved rock art of varying styles observed in the Kimberley with an aim of providing a thorough understanding of the formation and preservation of such materials in the context of dating [1]. This contribution includes processed powder X-ray Diffraction data, Scanning Electron Microscopy energy dispersive spectroscopy data, and Laser Ablation ICP-MS trace element mapping data.

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#### Specifications Table

Subject area	<i>Archaeological Science</i>
More specific subject area	<i>Geochemistry of rock art shelters</i>
Type of data	<i>Table and Figures</i>
How data was acquired	

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	<ol style="list-style-type: none"> <li>1. <b>Powder X-ray diffraction (XRD) analysis</b> (Bruker D8 Advance x-ray powder diffractometer with Ni-filtered Cu <math>\alpha</math> radiation (1.54 Å), Department of Chemical and Biomolecular Engineering, The University of Melbourne),</li> <li>2. <b>Scanning Electron Microscopy- Energy Dispersive X-ray Spectroscopy analysis (SEM-EDS)</b> (Quanta FEG 200 ESEM and a Phillips FEI XL30 environmental scanning electron microscope (ESEM) equipped with an OXFORD INCA energy-dispersive x-ray spectrometer (EDS), The School of Earth Sciences, The University of Melbourne)</li> <li>3. <b>Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS)</b> (Agilent 7700x quadrupole mass spectrometer, coupled to a Lambda Physik Compex UV 193 nm excimer laser system, The School of Earth Sciences, The University of Melbourne)</li> </ol>
Data format	Raw and analysed
Experimental factors	Characterisation of mineralogy and chemistry of mineral accretions associated with Kimberley rock art
Experimental features	Analysis of minerals, their quantities and their chemical composition
Data source location	Inland and coastal sites of the Kimberley region of Western Australia. Specific locations of the rock art sites from which samples were collected are not disclosed in this study in order to protect sites from unauthorised visitation and to respect the wishes of our indigenous partners. However, site localities relating to samples are given a reference number that correlates to an access-controlled archaeological site catalogue held at The University of Western Australia's Centre for Rock Art Research + Management.
Data accessibility	The data are available within this article

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## Value of the data

- Data presented here will be useful to other researchers as a benchmark for X-ray diffraction analysis of the range of mineral accretion systems present in Kimberley rock art shelters
  - Laser-Ablation trace element maps coupled with site and sample photographs of four distinct mineral systems present in shelters in the Kimberley region of Western Australia may be used to aid sampling strategies associated with future rock art dating programs
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## 1. Data

### 1.1. Data from laser-ablation trace element mapping

Laser ablation trace element maps of cross sectioned mineral accretions collected at rock art shelters in the Kimberley display variations in the characteristics of their internal micro-stratigraphies dependent on the mineral system to which they have been assigned (Figs. 1–22) [1]. The accretions also display differing concentrations of particular elements, which is useful for the assessment of the suitability of each accretion, and in turn, mineral system to particular radiogenic dating techniques. The varying concentration of these different elements also provides information which aids the generation of hypotheses surrounding the formation mechanisms associated with the different mineral systems.

### 1.2. Data from X-ray diffraction analysis

Tables 1 and 2 display the occurrence of a range of sulphate, oxalate and phosphate minerals across the four different mineral systems from a range of sites across the Kimberley. This is a semi-

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