



## **High-resolution analysis of silica and sulphate-rich rock varnishes from northern Victoria Land (Antarctica)**

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Rock varnishes on exposed surfaces of magmatic rocks in northern Victoria Land (Antarctica) have been analyzed using XRD, SEM-EDS and TEM-AEM techniques. The varnishes are tens of micron thick and consist of laminae with different chemical compositions. They always show sharp contacts with the underlying rocks. Two main chemical compositions have been recognized through energy dispersive analytical techniques: a silica-rich composition with minor Al, Fe, and Mg content, and a S (Fe)-rich composition with Al, K, and P as minor components. XRD and TEM data revealed that the Si-rich laminae are comprised of amorphous material with few nanometer-thick smectite crystals which mostly form in situ. The S-rich compositions correspond to subrounded areas and to laminae developed parallel to the rock surface which could have either an amorphous or a crystalline nature; the crystals are sulphates of the alunite-jarosite series which grow in the varnish.

The varnish texture indicates that it accreted on the external surface of the rocks: this micro-sediment derives from the accumulation of airborne dust followed by remobilization of elements and crystallization of clays and sulphate. Sulphur compounds may have different origins such marine spray and/or fallout of active volcanoes