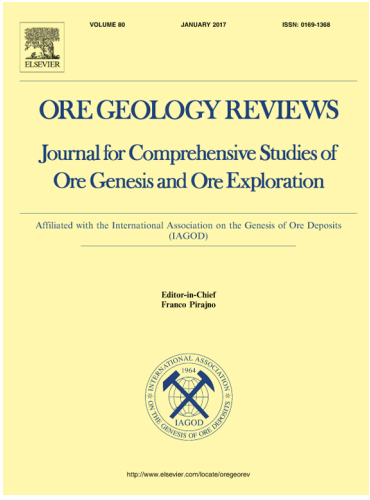

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Petrography and trace element signatures of iron-oxides in deposits from the Middleback Ranges, South Australia: from banded iron formation to ore

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Abstract

The Middleback Ranges is a major iron ore belt in the southeastern region of the Gawler Craton, South Australia, interpreted to be of BIF origin. Iron ore deposits are hosted within ~2550 Ma metasedimentary rocks of the Middleback Group and occur as a series of N-S trending hills, forming a ~60 km-long magnetic anomaly. A petrographic-geochemical study of iron-oxides from BIFs and iron ores was undertaken on samples from thirteen locations spanning the strike of the belt. Iron-oxides are texturally diverse due to multiple processes accompanying and postdating ore formation. Primary magnetite features preserved in the southern segment of the belt display distinct overprinting features (e.g., increased porosity, reworked grain boundaries) and multiple generations of growth associated with deposition of trace minerals, including native gold. Northwards along strike, this overprint is expressed by the pseudomorphic replacement of magnetite by hematite (martite) and is locally associated with brecciation, the

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