

Petrogenesis and magma chamber evolution of the Gawler Range Volcanics

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PETROGENESIS OF THE GAWLER RANGE VOLCANICS

ABSTRACT

The Gawler Range Volcanics (GRV) have been extensively studied previously, but a source and emplacement mechanism has yet to be agreed upon. This study aims to constrain the source region of the GRV and to make deductions about how the GRV evolved. This has been done through a number of modelling techniques, including AFC modelling and use of the *Rhyolite-MELTS* program. The ϵ_{Nd} values vary widely across the GRV, and these have been used in conjunction with trace element geochemistry to constrain the source region. It is deduced that the most primitive GRV basalts were the result of limited fractionation of a re-enriched refractory harzburgite source in the sub-continental lithospheric mantle. It is then shown that the entire GRV suite can be derived from one fractionation trend, however some assimilation is required.

KEYWORDS

Petrogenesis; magma; evolution; Gawler Range Volcanics; *Rhyolite-MELTS*; AFC; modelling; geochemistry

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