Geochemical and isotopic investigation into the tectonic setting of Mesoarchean and Paleoproterozoic granitoid suites within the eastern Gawler Craton, South Australia

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ABSTRACT

A geochemical study into a recently identified Mesoarchean Archean granitoid suite in the Eastern Gawler Craton, South Australia, has found that over a larger area the geochemistry and isotopes are variable. Granitoids of ~3240Ma have been dated using the SHRIMP, which look identical to the cooyerdoo but have trondhjemitic REE patterns. This study has used geochemical and Nd-Sm isotopic data to identify the tectonic setting and source region of Mesoarchean (~3150Ma) granitoids and amphibolites and Paleoproterozoic (~1730Ma) granitoids and amphibolites. The old and young granites are high K, Calc-alkaline, I type granites and are interpreted to have formed in a continental arc setting. There are a few enriched younger and older enriched mafics formed by metasomatism of the mantle. The ~3240Ma and ~3150Ma are interpreted to have been formed by the same tectonic event. This study has shown the eastern Gawler Craton to be even more complex than was thought from the Fraser et al. 2010 study.
Table of Contents
INTRODUCTION .................................................................................................................. 5
GEOLOGICAL SETTING .................................................................................................... 8
FIELD RELATIONSHIPS .................................................................................................. 11
SAMPLES AND PETROGRAPHY .................................................................................... 12
   Cooyerdoo and unnamed gneissic granite ............................................................... 12
   Young Pink Granite ..................................................................................................... 12
   Old and Young Amphibolites (old samples: 1723511, 1723518, 1723519, 1723520
   and young samples: 1721028, 1723523, 1723526, 1723515) .................................. 13
Age (U-Pb SHRIMP) ...................................................................................................... 13
GEOCHEMICAL AND ISOTOPIC METHODS ................................................................. 16
   Heat production measurements ............................................................................... 16
   Whole rock geochemistry ....................................................................................... 16
   Sm-Nd isotopes ....................................................................................................... 17
GEOCHEMICAL AND ISOTOPIC RESULTS .................................................................. 17
   Major element geochemistry .................................................................................. 17
   Trace and Rare Earth element geochemistry .......................................................... 19
   Sm-Nd Isotopes ...................................................................................................... 20
   Heat production calculations ................................................................................... 20
DISCUSSION ..................................................................................................................... 21
   Source regions ......................................................................................................... 22
   Tectonic setting of granites ..................................................................................... 26
   Significance of older and younger associations ....................................................... 28
   Heat production ....................................................................................................... 29
CONCLUSIONS ............................................................................................................... 30
ACKNOWLEDGMENTS ................................................................................................... 31
REFERENCES .................................................................................................................. 32