

Pillow basalts from the Mount Ada basalt, Warrawoona group, Pilbara Craton: Implications for the initiation of granite-greenstone terrains

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The Pilbara Craton represents the archetypal Archean granite-greenstone terrain in which mafic volcanic dominated supercrustals are intruded by granitic domes. This crustal morphology reflects distinct tectonic settings that formed in a hotter early Earth.

The ambient temperature in the Paleoproterozoic mantle is estimated to be 1600°C [1] and corresponds with the liquidus temperature of Barberton komatiites [2]. In the Paleoproterozoic mantle a pyrolite composition at depths of less than 100 km is expected to melt and generate ultramafic magmas.

Here we present volcanology, petrology and geochemistry data of well-preserved basaltic lavas ascribed to the Mount Ada Basalt, Warrawoona Group from the Doolena Gap Greenstone Belt. The Mount Ada Basalt was coeval with the Callina plutonic event that marks the initiation of dome formation in the Pilbara Craton [3]. The Doolena Gap sequence is exclusively pillow basalts with MgO < 10%. Isotopically the basalts are indistinguishable from contemporary non-chondritic Bulk Earth (ϵNd , 1.0 ± 0.2 and ϵHf , 2.3 ± 0.2).

Here we address the implications of Paleoproterozoic basalts with MgO% < 10 derived from melting of a source indistinguishable from non-chondritic Bulk Silicate Earth to the initiation and subsequent evolution of the Pilbara Craton.

[1] Korenaga, J. (2008) *Reviews of Geophysics* **46** (2008). [2] Puchtel, I. *et al.* (2013) *Geochimica et Cosmochimica Acta* **108**, 63-90. [3] Hickman, A. H. (2012) *Island Arc* **21**, 1-31.