



**HIGH T-LOW P METAMORPHISM IN THE KANAPPA HILL AREA OF
THE MOUNT LOFTY RANGES, S.A.; IMPLICATIONS FOR THERMAL
EVOLUTION**

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ABSTRACT

High T - low P metamorphic rocks in the Kanappa Hill area of the eastern Mt. Lofty Ranges preserve evidence for mineral equilibration during crustal thickening at temperatures marginally greater than 600°C and pressures of 3-5 kbars. Field and petrographic observations suggest that the high temperature portion of the P-T-t path experienced by these rocks was near-isobaric, with the implication that the thermal perturbation recorded by these rocks occurred in response to rapid advective heat transfer rather than to purely conductive processes. Estimation of the metamorphic fluid flux from a stable isotope study indicates that pervasive fluid flushing made no significant contribution to the thermal perturbation. Thermomechanical modelling of the response of the crust to magma emplacement predicts metamorphic conditions which closely match observations from the field, viz: (1) peak metamorphic temperatures reached during convergent orogenesis, (2) near isobaric P-T-t paths immediately before and after attainment of peak metamorphic conditions. Consequently high T - low P metamorphism in the Kanappa Hill Area is considered to have occurred in response to upper crustal emplacement of melts generated by subcrustal heat input.