

Melting Reactions and Their Characteristics in the Alvand Aureole Metapelites, Hamadan

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Intrusion of the Alvand complex (intrusions formed during Cretaceous-Tertiary) into the host metapelitic rocks (Jurassic schistes) created pelitic hornfelses and anatexitic migmatites in the Alvand aureole. Partial melting in the Alvand aureole was restricted to pelitic bulk compositions. Existing of spinel-quartz minerals and appearance of orthopyroxene in these rocks marks the transition from amphibolite- to granulite-facies conditions, and is commonly attributed to the process of fluid-absent partial melting. Reactions $Sil/And + Bt = Crd + Spl + Kfs + melt$ and $Bt + Als + Pl + Qtz = Grt + Kfs + melt$, are the most reactions for the development of melt in the metapelitic of Alvand aureole. This metamorphism is mainly controlled by advective heat input through magmatic intrusions into all levels of the crust. The Hamadan metamorphic rocks have experienced multiple episodes of metamorphism driven by burial and heating during arc construction and collision during subduction of a Neo Tethyan seaway and subsequent oblique collision of Afro-Arabia (Gondwana) with the Iranian microcontinent in the Late Cretaceous–early Tertiary, and these events are associated with local partial melting at high grades, near the Alvand complex pluton.

Key words: *Migmatite rocks; Alvand aureole; Melting reaction; Granulite-facies; Neo Tethyan; Partial melting*