



Petrographic and geochemical analysis of the Givetian-Frasnian sandstones in the Kuh-e-Tizi section, southeastern Central Iran

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The Givetian-Frasnian sandstones at the type section of Zarand Formation, sensu Wendt et al. (2002), unconformably overlie the Upper Cambrian Kuhbanan and underlie the Lower Carboniferous Hutk Formations respectively, in southeastern Central Iran.

Petrographical data show that these sandstones are well-sorted and sub-angular to rounded grains quartzarenite. They are highly enriched in quartz, but poor in feldspar, lithic fragments and heavy minerals. Diagenetic features include physical and chemical compactions (straight, concavo-convex, sutured grain contacts and pressure solution of quartz grain), reduction of the pore space through rearrangements, and cementation (mostly silica, as quartz overgrowth).

The provenance and tectonic setting of these sandstones have been interpreted using integrated petrographic and geochemical data. Petrographic analysis using standard methods (Basu et al., 1975; Dickinson et al., 1983) revealed that mono and poly-crystalline quartz grains have been derived from plutonic rocks of an interior cratonic setting. Elemental analysis and their ratios used for provenance studies (Th/Sc & La/Sc) which are similar to sediments derived from weathering of mostly felsic rocks (Amstrong-Altrin et al., 2004). Values representing chemical index of alteration (CIA) and the plagioclase index of alteration (PIA) range from 44.24 to 83.43, with an average of 69.96, and from 42.98 to 92.56, with an average of 75.8, respectively. However, most samples have values greater than 60, suggesting moderate to high weathering in the source area or during transportation prior to deposition.

Major and trace element concentrations indicated a depositional setting in a passive continental margin, resembling those defined by Bhatia (1983), Bhatia & Crook (1986), Roser & Korsch (1986) and Kroonenberg (1994). Therefore, it can be concluded that these sandstones have been derived from stable cratonic setting.

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