

Petrography and geochemistry of sandstones of the Padeha Formation in Aso section; Lut block, eastern central Iran, implication for provenance analysis

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Abstract

In this research, petrography and geochemistry of the sandstones of Padeha formation (Early-Middle Devonian) in Asu section, 40 km eastern Gonabad, located in Lut block have been studied. In this section, the thickness of Padeha formation is 210 m which is composed of siliclastic rocks. After field studies, 30 medium-grained sandstone samples were selected for point-counting and 10 sandstone samples were selected for geochemical analysis. The results of mineralogical studies show that monocrystalline quartz is the main phase and zircon and tourmaline minerals are the secondary phase. Based on the calculated percentages of point counting data, the composition of these sandstones has been detected as quartzarenite and sublitharenite. Petrographical evidence, such as, well rounded monocrystalline quartzs with straight extinction, lacking of plagioclase and low percentages of K-feldspar, ferromagnesian minerals, overgrowth silica cement, existence of rounded zircon and tourmaline imply craton interior and sediment recycled provenance. Moreover, using modal analysis data, (Qm95.5, F0.8, Lt3.6) and (Qt99.1, F0.8, L0) diagrams support this provenance. Based on geochemical data in discriminating tectonic diagrams, the Padeha Formation sandstones are deposited on a continental passive margin. These studies indicate that the studied sediments are likely deposited in the transition between the transformations of rifted margin to passive continental margin of Paleo-Tethys.

Keywords: *Geochemistry, Modal analysis, Tectonic provenance, Parent rock weathering, Padeha formation*