

Provenance study of Upper Paleozoic in Zagros using U-Pb dating of detrital zircon

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U-Pb dating on the detrital zircons has been fulfilled on sandstone samples from two sections of Abzagh and Zakeen in North of Hormuz Strait. Zakeen and Faraghan formations belong to Devonian and Permian sequence have been studied. This study implies important results on the paleogeography and tectonic setting of Zagros fold and thrust belt (Zagros FTB) in Paleozoic time. Detrital zircon dating can be classified in main five statistical populations based on frequency of the data: 0.5-0.6 Ga (27%); 0.7-1 Ga (50%); 1.3-1.5 Ga (2%); 1.8-2 Ga (5%); 2.8-2.4 Ga (16%). Approximately, 70% of the detrital zircons belong to Neoproterozoic those can be originated from exhumed magmatic rocks of Arabian-Nubian shield. Pan African orogeny in Neoproterozoic. Alternatively, Cadomian basement of Central Iran may be considered to be the most likely source for the late Ediacaran–Cambrian zircons because basement of such age is recognised within it, but according to the direction of the fluvial sandstones into Arabian plate in Paleozoic, the main age Zircon populations of Ediacaran-Cambrian (600-500Ma) may be correlative with rhyolites of Hormuz formation at ca. 558±7Ma. The rhyolites of the Hormuz can be appointed as the source rock for Ediacaran- Cambrian detrital zircon sandstones of Zagros, since this recorded a prominent tectono-magmatic event associated with subduction of the Proto-Tethyan Ocean crust along the east margin of Gondwana and the megasuture margin of the Arabian–Nubian shield.

The youngest ages of detrital zircons are concordant with the stratigraphic age. Based on the difference between crystallization age (CA) and depositional age (DA), two tectonic settings of collisional and extensional have been implied for Devonian, Zakeen formation, and Permian, Faraghan formation, respectively.