

## **Geochemistry, Petrology, Geodynamic and Radiometric age of Pichagchi batholith (north Takab) Northwest Iran.**

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Pichagchi batholith is located in 35 km southeast of Shahin Dezh northwest Iran. This batholith is situated in Central Iran cutting Paleozoic rocks.

Pichagchi batholith consists of Quartz Diorite, Tonalite, Granodiorite and Quartz Monzodiorite where mafic minerals are Biotite and Amphibol. Enclaves are Micaschist and fine grained Quartz Diorite in various sizes. Cribbrate texture and zonation in Plagioclase minerals indicate that the original magma has been produced by magma mixing of lower crust and upper mantle.

Geochemistry study of the main elements shows a calc-Alkaline and metaluminous magma is produced in 700-800°C over 30 km deep in the crust. Genetic parameters of this batholith is compatible with I-type granites (Caledonian).

Rare earth elements geochemistry which are demonstrated through spider Diagrams show average slope of the plotted data is from K towards Cr (left to right). This indicates partial melting. Depletion compatible elements (Ni, Cu, V) and enrichment of incompatible elements imply that magma was not original and not initiated from mantle. Trough of Nb could be interpreted by magma mixing with crustal materials or subduction related origin. Trough of Ti and crest of Y elements show that the origin of related magma is I-type.

Pichagchi batholith is orogenic and its tectonic setting is compatible with Continental Arc Granitoids (CAG).

Absolute age of Pichagchi batholith by K-Ar radiometric are 74.20 m.a.. This age determines Late Cretaceous- Palaeocene time of Laramide orogeny.