

# Geochemical-isotopic characteristics and K-Ar ages of magmatic rocks from Hundar valley, Shyok Suture Zone, Ladakh

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Hundar section rocks of the Shyok Suture Zone comprise predominantly diorite, granodiorite with minor gabbro-dolerite, two types of granite, volcano-clastic sediments and tuffs that are intruded by diabasic dykes. Diorite samples contain pyroxene, amphiboles and plagioclase as major phases. Quartz and alkali feldspar, showing myrmekitic intergrowth are found in granites. Gabbro-dolerite comprises feldspar, biotite, hypersthene and hornblendes. Andesitic dykes have euhedral plagioclase phenocryst within fine-grained groundmass.

Major and trace element display trends expected for igneous rocks from mafic to felsic compositions. Data indicate fractionation of olivine, pyroxene, feldspars and Fe-Ti oxide phases during evolution of the magma. Normalized REE plots depict light REE enrichment and middle - heavy REE moderate fractionation. Multi-element patterns also display enrichment of large ion lithophile elements (LILE) and depletion of high field strength elements (HFSE) with significant negative Sr and Eu anomalies.

Hundar samples do not define any collinear array for Rb-Sr or Sm-Nd isotope evolution indicating multiplicity of sources for

magmas.  $\epsilon_{Nd}(t = 100)$  varies from +3.7 to -7.4, while the  $\epsilon_{Sr}$  varies from -7 to +50.  $\epsilon_{Nd}$  vs.  $\epsilon_{Sr}$  diagram plots for Hundar samples partly overlaps the mantle array and partly that of Ladakh pluton. The samples of Ladakh pluton have extended  $\epsilon_{Nd}$  and  $\epsilon_{Sr}$  values up to -8 and +165 respectively. Probably magmas of the Hundar section were variably contaminated by enriched and long lived continental crustal components.

Eight samples from the Hundar section yield K-Ar ages from 60.8 Ma to 65.8 Ma. The medium-grained granite shows younger age (60.8 and 61.8 Ma) compared to the coarser-grained granite of 63.9 Ma. Three coarse-grained diorite samples yield the age from 64.4 to 65.8 Ma. Two microdiorite samples in the center of Hundar section yield the age of 64.0 and 64.4 Ma. The coarse grained granite samples having magma mingling structure with the microdiorite gives the similar ages of 63.9 and 64.4 Ma respectively. Two coarse grained diorite display the oldest age (65.8 Ma) in the area. These age data indicate that the magmatic rocks of the Hundar section are much older than the dominant magmatic phase (~58 Ma) of the Ladakh batholith and therefore could be unrelated.