

Mineral chemistry and geothermobarometry of gabbroic dykes of the Garmab Ophiolite sequence (Northeast of Kamyaran)

Shahryar Mahmoudi *¹, Ayoub Veisia ² and Mir Ali Asghar Mokhtari ²

¹ Department of Geochemistry, Faculty of Earth Sciences, Kharazmi University, Tehran, Iran

² Department of Petrology, Faculty of Geology, Zanjan University, Zanjan, Iran

Abstract

The Garmab ophiolite complex, a part of the Ophiolite-Radiolithic zone of Kermanshah, is located in the northeast of Kamyaran. In view of the Iranian geo-structural zones, this complex is situated between the Sanandaj-Sirjan Zone and the Zagros thrust Zone. Field studies demonstrate that the dykes with gabbro (pegmatoidic gabbro, microgabbro and gabbro-norite) and diabasic composition have crosscut the peridotites of the ophiolite complex. The main minerals of gabbroic rocks include plagioclase (andesine and occasionally anorthite in pegmatoidic gabbros and oligoclase to andesine in microgabbros) and clinopyroxene (diopside-augite). The amphiboles belong to calcic amphiboles group (magnesian-hornblende and actinolite). Mineralogical and geothermometry studies of the clinopyroxene, amphibole and the plagioclase from the pegmatoidic gabbro reveal that these rocks have originated at 800 to 1200 °C. Moreover, geobarometric measurements, based on aluminum content within the amphiboles, indicate pressures between 5 to 7 kbar for the final equilibrium of the minerals studied. The chemical compositions of the clinopyroxene and the amphiboles indicate that the aforementioned minerals have crystallized from a sub-alkaline magma in an island arc or volcanic arc (IAT) tectonomagmatic setting. In addition, the gabbroic dikes formed from a mantle source in a subduction zone.

Key words: Mineral Chemistry, Oxygen Fugacity, Subduction, Gabbro, Garmab Ophiolitic Complex, Zagros

* s.mahmoudi@khu.ac.ir