

Geochemistry and Petrogenesis of the Volcanic Rocks of Mawat Ophiolite Complex , NE-Iraq

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The Mawat ophiolite complex represents a remnant of oceanic lithosphere formed in Upper Cretaceous. This study concentrates on the upper volcanic part of Mawat ophiolite.

All rock samples which are dominantly defined as basalts have been subjected to various degrees of ocean-floor hydrothermal metamorphism and alteration of greenschist - lower amphibolite facies. The first metamorphic event (M1) occurred during Albian-Cenomanian has often resulted in recrystallization of the primary igneous phases. This was overprinted by local metamorphic event (M2) accompanied thrusting and emplacement of ophiolite during the Miocene.

Mawat ophiolite has a very low Ti characteristic of island arc tholeiitic (IAT) and boninitic affinities. The enrichment of LILE and depletion of the HFSE and REE are the main features of the volcanic rocks. They are indicative of subduction related environment .

The parallel-subparallel and flat REE patterns of the three selected traverses indicate that they have originated from the same mantle source dominated by harzburgite and dunite. It seems most likely that these rocks were derived by a process of fractional crystallization from a common basaltic melt. This melt was generated by approx. 20-35% partial melting of a depleted mantle source. The geochemical evidences show that Mawat ophiolite was formed in the early stages of intraoceanic young suprasubduction zone (SSZ) at a palaeo-ridge axis or close to it which lead to contemporaneous eruptions in a fore-arc setting of island arc tholeiitic basalts and boninites .