

Diversity of mafic dikes and related magmatism in the southern Fizh block, the Oman ophiolite

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We report petrologic and geochemical characteristics of mafic to ultramafic dikes in the mantle section of southern Fizh block to discuss magmatism producing these dikes.

Python and Ceuleneer (2003) reported dominance of gabbronorite and pyroxenite families in Fizh block. Only a small number of dikes in the olivine gabbro family are distributed in northernmost Wadi Fayd area.

Our study is mostly consistent their results although there are some new findings. First, gabbronorites occur closely associated with shear zones in Fizh block. Moreover, the strikes of dikes in field are parallel to the shear zone. Their occurrence indicates that the melt crystallizing gabbronorites have ascended through shear zone.

Second, some gabbronorites contain clinopyroxenes with high Mg#, TiO₂, Na₂O and plagioclase with low An% indicating affinity to MORB and oceanic gabbros. On the other hand, the rest of gabbronorites have clinopyroxenes with lower Mg#, TiO₂, Na₂O and plagioclase with high An% indicating affinity to SiO₂ and H₂O-rich melt depleted in incompatible elements (Python and Ceuleneer, 2003). It is noted that both gabbronorite types were found in Wadi Fizh, Wadi Bani Umar, Wadi Hayl.

Pyroxenites are distributed over the southern Fizh block without any particular relation to shear zones. Cr# and TiO₂ content of pyroxenite spinels are similar to those for island arc volcanics indicating island arc affinity (Tamura and Arai, 2006). Because gabbronorite dikes cross pyroxenite dikes the former is younger than the latter.