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Title: Petrogensis of the Nesryin gabbroic intrusion in SW Sinai, Egypt: New contribution from mineralogy, geochemistry ,Nd and Sr isotopes.

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Abstract:

The Wadi Nesryn gabbroic intrusion is part of the Neoproterozoic Pan-African basement cropping out in southern Western Sinai of Egypt. The intrusion comprises homblende gabbro, pyroxene-homblende gabbro, diorite and appinitic varieties. It exhibits chilled margins against the older rocks represented by fine-grained gabbro and dolerite and belongs to what is known throughout Egypt as the "younger gabbro suite". Mineralogy, mineral chemistry and whole rock geochemistry indicate that these rocks were derived from tholeiitic magmas with minor calc-alkaline affinity. They have chemical signatures of subduction related are rocks formed at an active convergent plate margin. They were formed by 15-30% of partial melting of a garnet therzolite and to a minor extent of spinel-garnet therzolite sources, modified by fluids related to a subducting slab. Pressure estimates using the apmphibole geobarometer indicate that the gabbroic rocks crystallized at pressures between 2.8 and 5.6 kbar (average = 4.3 kbar). Diorites record lower formation pressures between 1. and 3.7 kbar (average = 3.0 kbar) . The temperature estimates calculated by several geothermometers yielded crystallization temperatures ranging from 674 °C, with an average of about 817 C. The whole rock Rb-Sr isochron age of the Nesryin gabbroic intrusion is 617+ 19 Ma with initial 87Sr/86Sr = 0.70322+0.00004. This age indicates that the mafic ultramafic plutons in the Pan-African belt in southern Sinai belong to the Egyptian younger gabbros and not to the older metagabbro-diorite complexes or ophiolitic suites. The rocks have low 87Sr/86Sr initial ratios ranging from 0.703141 to 0.703338 and negative ε Sr ranging from -6.34 to -9.14 . The initial 143Nd/144Nd ratios range from 0.511944 to 0.512145 with positive and high ε Nd values (1.93 to 5.86) reflecting a mantle contribution in their petrogenesis.