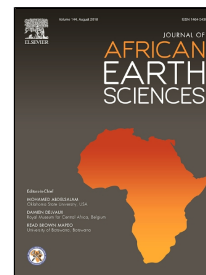


# Accepted Manuscript

Enrichment of rare earth and radioactive elements concentration in accessory phases from alkaline granite, South Sinai- Egypt

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PII: S1464-343X(18)30204-8  
DOI: 10.1016/j.jafrearsci.2018.07.008  
Reference: AES 3270  
To appear in: *Journal of African Earth Sciences*  
Received Date: 11 March 2018  
Accepted Date: 09 July 2018

Please cite this article as: N.I. Abd El Ghaffar, Enrichment of rare earth and radioactive elements concentration in accessory phases from alkaline granite, South Sinai- Egypt, *Journal of African Earth Sciences* (2018), doi: 10.1016/j.jafrearsci.2018.07.008

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1 Enrichment of rare earth and radioactive elements concentration in accessory phases from  
2 alkaline granite, South Sinai- Egypt

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## 8 **Abstract**

9 The occurrence of a unique accessory mineral association in alkaline granite of  
10 Wadi Umm Adawi-Yahmid area, South Sinai with significant enrichment of Rare earth  
11 elements (REE), Th, U and Y is described. These minerals are chevkinite, zircon,  
12 monazite, apatite and thorite. Chevkinite is recorded for the first time in this type of  
13 granite. Petrographical and textural criteria indicate that apatite, zircon and chevkinite  
14 are the early crystallized phases while thorite and monazite are the late phase. REE  
15 abundance is clearly indentified in chevekinite, monazite and Apatite while; Th, U,Y are  
16 concentrated in chevkinite and zircon. The distribution of REEs , Th, U and Y in alkaline  
17 granite result from processes allowing substitution, redistribution and enrichment such  
18 processes include late or post magmatic (fractionation and alteration). Alkaline granite of  
19 the studied area and its weathering product may be considered as a potential source of  
20 REEs , Th, U and Y.

21 **Keywords:** Alkaline granite, Chevkinite, Zircon, monazite, Thorite, Rare earth elements,  
22 Th,U, South Sinai.

## 23 **1. Introduction**

24 Southern Sinai basement rocks include numerous Neoproterozoic plutons of A-  
25 type granite which are considered as a promising source for the rare and radioactive  
26 elements.

27 Rare earth elements (REE) and radioactive elements are regularly associated with  
28 high fractionated granite and pegmatites. Enrichment of REE,U, Th, Nb, Zr and Hf result  
29 due to the presence of significant accessory minerals like, zircon, monazite, allanite,  
30 chevkinite, apatite and thorite, (Shurmann, 1966; Rogers and Adams, 1969; Bea, 1996;  
31 Rogers and Adams, 1969; Bea, 1996; Linnen and Keppler, 1997; Förster, 2006; Vlach

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