Mineralogical, Geochemical and Radiometric studies on the granitic rocks of Wadi Sabbagh area, South Sinai, Egypt.

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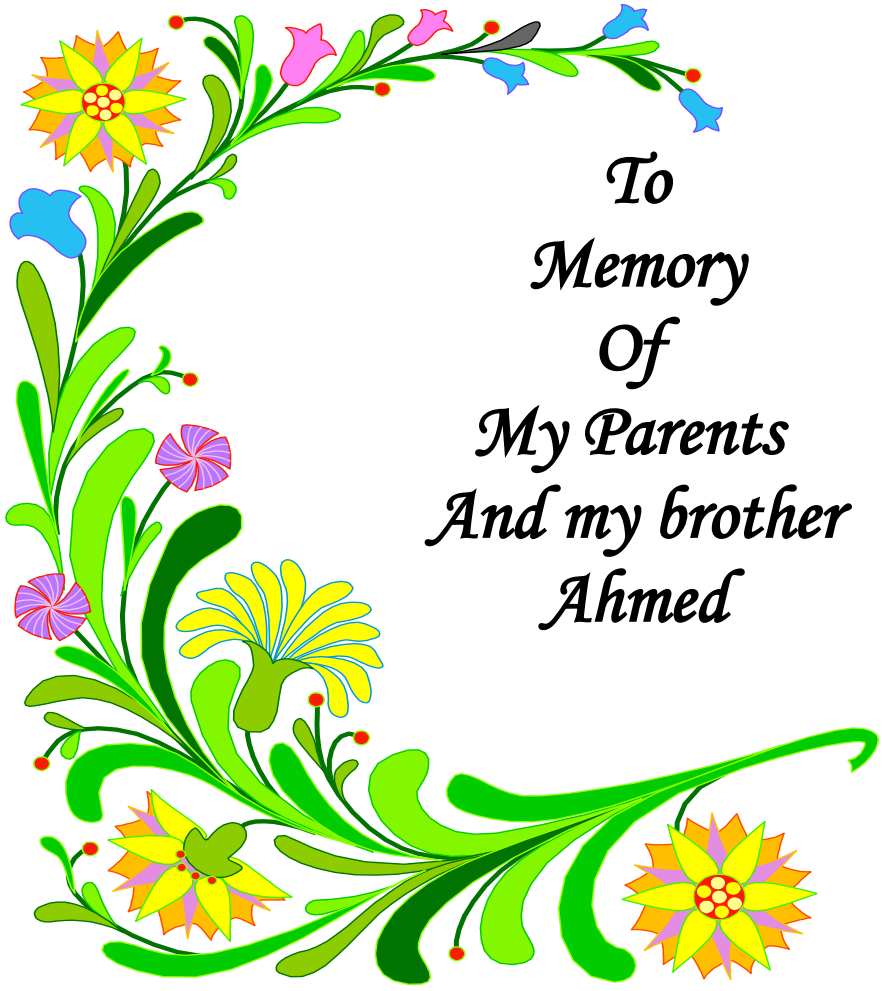
To
Memory
Of
My Parents
And my brother
Ahmed

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ABSTRACT

The main aim of the present work is to throw the lights on the mineralogical, petrographical, geochemical and radiometric characters of the granitic rocks and associated pegmatites at Wadi Sabbagh area, south Sinai, Egypt.

The field observations and relationships between the rock varities revealed that the studied area is chiefly comprised by four rock unites. These rock unites can be arranged according to the following sequnces, starting from the oldest to the youngest; as migmatites, metasediments, older (syn-collision) granites, younger (post-collision) granites as well as pegmatites and dykes.

Based on the petrographic investigations, the older granites comprise tonalite and granodiorite, while the younger granites are classified as monzogranite, syenogranite and alkaline granite.

Geochemically, the investigated older granites are of calc-alkaline, I-type granites originated at depth ≥30 Km and formed in a volcanic arc setting, whereas the younger granites and accompanying pegmatites have calc-alkaline, alkaline to peralkaline features, A-type granites originated at depth 20-30 Km and belong to the within plate tectonic setting. The altered granites in the study area are represented by sericitic, hematitized and albitized granite.

The average of the REE of the studied granitic rocks is 210.3 ppm for tonalite, 233.3 ppm for granodiorite and 247.3 ppm for monzogranites which is below the average REE of the world wide granites (250-270 ppm), whereas syenogranite (270.6 ppm) and alkaline granites (278.1 ppm) averages are relatively higher than the world wide granites.

The field radiometric survey of the study area recorded radioactive anomalies in certain pegmatites and altered monzogranites. The radiometric measurements using γ-ray spectrometer (NaI–Detector) showed that the eU reaching up to 155 ppm in the anomalous pegmatite samples and the eTh content reaches up to 257 ppm, whereas the Ra

content reaches up to 148 ppm. The eU, eTh and Ra reach up to 305, 382 and 127 ppm, respectively in the highly anomalous monzogranites. The mineralogical investigations using XRD besides ESEM techniques revealed that, the radioactivity of the anomalous pegmatites are attributed to the existence of thorite, uranothorite, zircon, fluorite, columbite, samarskite, monazite, xenotime and allanite. The radioactivity of the altered monzogranites are chiefly attributed to existence of thorite, uranothorite, zircon and fluorite.

KEY WORDS: Wadi sabbagh, older , younger granites, pegmatites, anomalies, radioactivity.

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