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The Wadi Akhdar area is made up mainly of younger granites (syeno-, and monzogranites) intruding granodiorite with sharp contacts. These granites are dissected by swarms of shear zones, one of which exists along the contact between the two types of granites. The shear zones trend NW-SE and consist of closely spaced fractures along which alteration products pegmatitic dykes and pockets and hydrothermal veins are recorded. Detailed spectrometric and mineralogical studies are carried out on the shear zone. The geochemical characteristics of the monzogranite indicate derivation from peraluminous magma having features of the I-type granite and emplaced in volcanic arc tectonic environment. The syenogranite (A-type granite) originated from a magma which has peraluminous to metaluminous characters and emplaced in within-plate tectonic setting. The wide ranges of major and trace element compositions of these two granite types are generally attributed to variations of source compositions, tectonic environments and models of emplacement which explain the petrogenesis of a particular suite. The spectrometric study of the shear zone reveals that it has high uranium-thorium concentrations. In this mineralized shear zone, seven important uranium and uraniferous minerals together with some rare metals were detected. These minerals include uraninite, uranpyrochlore, davidite-(Ce), liandratite, walpurgite, thorogummite and weeksite. The proposed origin of these minerals is hydrothermal since they occur within pegmatitic dykes and pockets and hydrothermal veins as well as along the fracture planes associated with the alteration products such as silicification, hematitization epidotization and kaolinization hematitization epidotization and kaolinization.
