Chemical composition of biotite as a guide to petrogenesis of granitic rocks from Maherabad, Dehnow, Gheshlagh, Khajehmourad and Najmabad, Iran

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Abstract: Biotite, the dominant ferromagnesian mineral in granitoid rocks, can be used to discriminate tectonic setting, magma types and magnetite- ilmenite series. In this study, we analyzed biotite with an electron microprobe (wavelength dispersion) from different granitoids. Intrusive rocks from Maherabad porphyry Cu-Au prospecting are meta-aluminous. Biotite from Maherabad are Mg-rich type and the ratio of Fe/(Fe+Mg) is 0.286-0.309. Maherabad biotite compositions fall in the field of (sub-alkaline) calc-alkaline orogenic suites. Based on High TiO2 and low Al2O3 in biotites, Maherabad also belongs to magnetite series. Intrusive rocks from Najmabad, Dehnow, Gheslagh and Khajehmourad (NDGK) are classified as belonging to the ilmenite-series of reduced S-type granitoids. Biotite from NDGK areas are Fe-rich and the Fe/(Fe+Mg) ratio in Najmabad is 0.491-0.511, in Dehnow-Kuhsangi 0.583-0.675, Gheslagh 0.56-0.58, and Khajehmourad 0.705-0.720. respectively NDGK biotite compositions fall in the field of peraluminous granite (P) suites (S-type). Based on low TiO2 and high Al2O3 in biotites, Najmabad, Dehnow and Gheslagh biotite belong to ilmenite series.

Keywords: Biotite, Najmabad, Maherabad, Khajehmourad, susceptibility.