

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, Gheshlagh 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, Gheshlagh 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 Gheshlagh biotite belong to ilmenite series.

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