

# Calculation of oxygen fugacity for intermediate-acid intrusive rocks

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**Abstract:** Oxygen fugacity is one of the important parameters of physical-chemical condition in petrology, which shows an obvious controlling action in the magmatic evolution, petrogenesis and magmatic-hydrothermal mineralization. Minerals containing variable valence elements are often used to calculate oxygen fugacity of rock-forming and mineralization, but comparative study on different methods is rare, and the applicability of different methods is not clear. We studied the oxygen fugacity of Heigoubei granite pluton in the northeast of Shanxi Province, China by calculating biotite, hornblende, magnetite-ilmenite and zircon Ce anomalies. The estimated results by different methods show obvious difference, even the contradictory results. In contrast, oxygen fugacity calculated results based on  $Fe^{3+}/Fe^{2+}$  ratio of biotite and magnetite-ilmenite are comparable with each other, reflecting that those calculating methods are suitable for intermediate-acid intrusive rocks. Results calculated based on  $Fe/(Fe+Mg)$  ratio might be affected by chemical component of magmas, unsuitable for the calculation of intrusive rocks with low Mg content.

**Keywords:** Oxygen fugacity; mineral geothermobarometry; biotite; granite