

Biotite geochemistry of the western belt granitoids of Peninsular Malaysia

ABDELMONIEM AHMED MASOUD, TEH GUAN HOE & AZMAN A. GHANI
Department of Geology, University of Malaya, 50603 Kuala Lumpur

This study involves the petrological and geochemical characterization of biotite from 25 granitoids of the western belt of Peninsular Malaysia and 3 from South Johor. The Main Range granite representing the western belt plutons is a coarse to very coarse grained porphyritic biotite-muscovite granite that usually contains altered biotite with pleochroic colours from pale brown to slight darker brown to a dark rich brown or reddish brown colour and have inclusions of zircon, monazite, ilmenite, fluorite, xenotime, apatite, rutile, iron oxide and other opaque minerals. In contrast, the South Johor granite is medium to coarse grained porphyritic hornblende-biotite granite with biotite of light grey-green and brown to dark muddy brown pleochroic colours and inclusions of zircon, apatite, rutile, iron oxide and other opaque minerals. Data from electronprobe microanalyses of biotites of the granitoids were plotted in discrimination diagrams to highlight their distribution patterns. The biotites from the Penang, Kuala Lumpur, Negeri Sembilan and Pahang granites are mainly plotted in the peraluminous field and the biotites from the Perak granites are mainly plotted in the alkaline field. The biotites from the Selangor, Kedah and South Johor granites are mainly plotted in the calc-alkaline

field. The average SiO_2 , TiO_2 , MgO , K_2O , Al_2O_3 , MnO and FeO contents of biotites are about 35 wt%, 3 wt%, 5 wt%, 8 wt%, 16 wt%, 0.5 wt% and 27 wt%, respectively. The study revealed the distinctive biotite distribution patterns of the four granitoids namely, Teluk Bahang (Penang), Papan (Perak), Batu Tiga (Selangor) and Hume Quarry Kulai (Johor) which have lower than average SiO_2 , TiO_2 and K_2O contents in their biotites and higher MgO , Al_2O_3 , MnO and FeO contents. Such trends are probably related to the nature of the magma they have crystallised; tectonic setting or whether they are S-type or I-type granites. The study demonstrates that the composition of igneous biotites of the western belt of Peninsular Malaysia clearly reflect the nature of their host magmas.