

Petrology and geochemistry of granitic rocks from Macao

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During Mesozoic, the Cathaysia block, where Macao is located, was affected by granitic plutonism generated during the Indosinian and Yanshanian orogenies. Granitic rocks from Macao seem to have been emplaced at least during two distinct periods: middle-upper Jurassic (estimated for most samples: ~ 164 Ma) and Cretaceous (for the southern island – Coloane: ~ 94 Ma). The latest are distinctly younger than granites from neighbouring regions. The majority of rocks outcropping in the Macao are medium to coarse-grained granites, although outcrops of fine-grained granites also occur. Granitic rocks are frequently cut by quartz veins, and by acid dykes (microgranites, aplites and pegmatites). Contrarily, with the neighbouring areas, volcanic rocks are not present but some andesitic dykes were identified. Granitic rocks from Coloane also contain frequent meso to melanocratic microgranular enclaves. Petrographic and geochemical analyses from the dominant granitic rocks suggest that they are mostly I-type (sometimes highly fractionated: SiO₂ up to 76 wt.%) with A/CNK and A/NK ratios consistent with peraluminous composition. Trace element patterns evidence high HFSE/LILE ratios and low LREE/HREE, as well as Sr and Eu negative anomalies, interpreted as the result of plagioclase fractionation. Andesitic dyke samples show a less pronounced HFSE and LREE enrichment and no Eu anomalies. Our results suggest that Macao granitic rocks are mostly derived from infracrustal melting related to a period of high heat transfer from mantle to crust as consequence of geotectonic regimes related with the subduction of the paleo-Pacific plate beneath the Eurasia.