

Some problems with the classification of the 'S' type granite with particular reference to the Western Belt granite of Peninsular Malaysia

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The Peninsular Malaysian granites have been grouped into two granite provinces namely Western and Eastern Belt granites. The Western Belt has been considered as constituting an exclusively 'S' type granite. The 'S' type features in the granites are, (a) high initial $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratio > 0.710 , (b) low Na_2O content, $< 3.2\%$ Na_2O in rocks with $\sim 5\%$ K_2O , (c) narrow range of felsic rock (SiO_2 : 65.95 to 77.4%), (d) high $\text{K}_2\text{O}/\text{Na}_2\text{O}$ ratio, 1.4–2.8 ('S' type: 0.9–3.2), (e) usually ilmenite bearing and (f) contain pelitic or quartzose metasedimentary xenoliths. However, detailed study of published and unpublished field and geochemical reports reveal that the Western Belt granite shows mixed 'I' and 'S' type features and thus the batholiths cannot be designated as exclusively 'S' type. The 'I' type features are (a) Al-rich minerals such as sillimanite and cordierite are absent, (b) occurrence of primary wedge sphenes and pale green amphibole especially in the northern part of the batholith, (c) occurrence of pinkish K-feldspar crystals (usually as phenocrysts), (d) occurrence of mafic, hornblende bearing enclaves, (e) increasing ACNK values with SiO_2 , (f) showing a similar trend to the 'I' type granite in P_2O_5 vs Rb and A-B plots. Implication of this study indicates that the Western Belt granite is not solely derived from metasediments. The study favours a mixed origin of crustal material such as metapelites, greywackes and metaigneous rocks.
