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## MINERALS ABSTRACTS

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### Granites of Southeast Asian Tin Belt

The objective of this study is to establish the essential granite geology of the southeast Asian tin belt, distinguishing plutons within batholiths and characterizing them by their component units, field relationships, lithology, texture, petrology, geochemistry, geochronology, and mineral potential. To date, approximately 180 plutons have been recognized and partly or entirely described in the above terms. In addition, four granite provinces have been delineated, each with its own distinctive mineralization pattern, as follows: (1) the Main Range province, endogenous greisen-bordered vein swarms of cassiterite and wolframite; (2) Eastern province, magnetite-cassiterite skarns  $\pm$  base metal sulfides with antimony in Thailand; (3) Western (peninsular Thailand-Burma) province, endogenous greisen-bordered vein swarms and pegmatites of cassiterite and wolframite; and (4) North Thailand Migmatitic province, endogenous vein and skarn replacement scheelite and fluorite deposits with some tin and local antimony.

In all provinces, but particularly in the Main Range, granitoids designated as two-phase variants have been recognized where xenocrysts and xenoliths of coarse, primary texture granite are enclosed in and corroded by an invasive, equigranular quartzo-feldspathic matrix. These rocks form an essential part of the granite sequence in all provinces and have probably resulted from the infiltration and disruption of the host granite by late-stage magmatic fluids.

Whole-rock geochemistry from peninsular Malaysia shows that the granites from the Main Range and Eastern provinces comprise two contrasted suites, which correspond approximately to the I- and S-type categories advocated by Chappell and White. In addition, individual plutons within batholiths in the two provinces have distinct geochemical parameters. Variation diagrams of plutons having the intrusive sequence primary texture granite-two-phase granite-microgranite show linear trends with increasing  $\text{SiO}_2$ ,  $\text{Na}_2\text{O}$ , Rb, W, Sn, and U, and decreasing Sr, Ba, Th, and all other major elements.