

CRUSTALLY-CONTAMINATED KOMATIITIC BASALTS IN SOUTHERN CHINA: PRODUCTS OF A PROTEROZOIC MANTLE PLUME

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Abundant mafic and ultramafic rocks including basalts, komatiitic basalts, and peridotites occur in the Proterozoic Sibao Group, Northern Guangxi, Southern China. The basalts comprise thick sequences of pillows in many places. The komatiitic basalts are typically spinifex-textured and, in a few cases, show the accumulation of pyroxene associated with Ni-Cu-(PGE) sulfide deposits. The peridotites occur as the lower portions of differentiated sills which have gabbro and diorite in their upper parts. The sills are believed to be co-magmatic with the komatiitic basalts. The spinifex-textured, komatiitic basalts have $\text{MgO}=5.37\text{--}17.9$ wt% and $\text{TiO}_2 = 0.44$ to 0.74 wt%. They display negative Ti-, Nb-, and P-anomalies, positive Th anomalies and chondrite-normalized REE patterns enriched in LREE. These features are consistent with their formation from a crustally-contaminated, komatiitic basalt magma. During this process of crustal contamination, the magmas also assimilated sulphur from the sediments which caused sulphide-saturation resulting in the formation of metallic sulphide deposits. The occurrence of the komatiitic basalts in the Sibao Group can be explained by the presence of a mantle plume in a continental rift environment during early Proterozoic time. This study implies that the Yangtze Block may have had an Archean basement through which the Sibao komatiitic basalts erupted.