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Geochemistry and Petrogenesis of Cretaceous Adakitic Dykes from Eastern Cathaysia Block

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An intrusive dyke is linear in regional scale, tectonic stresses play an important role in controlling the orientation of fractures that form for the dyke when magma rises buoyantly into the lithosphere (Gudmundsson, 2000; Rubin, 1995). Hence the dyke that has tectonic properties and significance is a favorable medium for studying deep magmatism and geodynamic process.

The ages of dykes in Hui'an, Fujian Province, become younger gradually from inland to coast (90 to 84 Ma). The dykes present a phenocryst assemblage of plagioclase (~ 60 %), hornblende (~ 35 %) and quartz (< 5 %), with resorbed and embayed grain's boundary. It is worth mentioning that we have discovered adakitic dykes (84 Ma) in Hui'an, with high Sr/Y ratios (89 to 100), low SiO₂ (63.12 %), K₂O (1.5 to 1.6 %), Ni (15 to 16 ppm) and Cr (~ 20 ppm) content and their slightly negative $\epsilon_{Nd}(t)$ values (-1.7 to -1.8) and positive $\epsilon_{Hf}(t)$ values (2.9 to 4.3), which indicate that they unlikely derived from the thickened crust (Moyen, 2009) and the fractionation of mantle-derived primitive arc magma.

Magmatic basic granulite (MBG) xenoliths and cumulate basic granulite (CBG) xenoliths are distinguished from Cenozoic basalts in Eastern Cathaysia Block (Yu et al., 2003). Comparing with these dykes, the MBG has similar trace element patterns and lower $\epsilon_{Nd}(t)$ values (-3.0 to -4.0, the lowest value is -9.4), while the CBG has lower trace element content and depleted mantle-

like $\epsilon_{Nd}(t)$ values (5.5 to 7.2). Therefore, we suggest that these dykes are derived from the mixed melt between the MBG and the CBG from basic lower crust source. The proportion of melt from the MBG is dominant. The high strontium content of these dykes may derive from melting of plagioclase in CBG-like lower crust which have the features of depleted mantle (Yu et al., 2003). The processes of these dykes formation reveal that the crust of Eastern Cathaysia Block had undergone Cretaceous extension and horizontal expansion. [Financially supported by the program SINOPROBE-04-02, the Special Funds for Sciences and Technology Research of Public Welfare Trades 201011054 and the research grant of Guangxi Key Laboratory of Hidden Metallic Ore Deposits Exploration 15-140-27-13].

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