Ca. 780 Ma A-type granites in South China: Implications for the breakup of supercontinent Rodinia

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Neoproterozoic (830-740 Ma) calc-alkaline or peraluminous intrusive rocks are widespread in the Yangtze Block, South China, which has been considered a part of the Precambrian supercontinent Rodinia [1-6]. The tectonic setting of these rocks, however, remain in dispute and two distinctly different interpretations, continental rift or volcanic arc settings, have been suggested, implying different positions for South China in the Rodinian reconstruction [1-2]. Our study, along with other recent work [7-8], documents the presence of 777-773 Ma, 770 Ma, and 783-773 Ma (zircon U-Pb ages) A-type granites in the southeastern, northeastern and western Yangtze Block, respectively. Some of them exhibit very high zircon saturation temperatures of close to 1000°C, and high whole rock $\varepsilon_{Nd}(t)$ (+2.97 to +6.15) and zircon εHf(t) (+6 to +16.2) values. The A-type granites were most probably produced by high-temperature melting of slightly older underplated basaltic rocks in the lower crust under rifting setting, possibly as a result of a ca. 780 Ma mantle plume. The wide occurrence of ca. 780 Ma A-type granites around the Yangtize Block support the hypothesis that rifting of south China from Laurentia initiated by a ca. 780 Ma mantle plume during the breakup of Rodinia [3,5].

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A high CH_4 uptake rate in subtropic karst soils in southwest China

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Texture of the soil originated from carbonate rock is generally fine, which perhaps result in a low CH_4 oxidation rate due to the limit of gas transport. To evaluate the CH_4 uptake in subtropic karst soils, CH_4 flux and vertical profile of CH_4 mixing ratios were monthly measured from June of 2006 to May of 2007 in ten sites in southwest China. The CH_4 uptake rate (2.70 mg CH_4 m^{-2} d^{-1}) is much higher than the widely-cited values in soils in the previous studies. Seasonal patterns of CH_4 flux showed two absorption peaks occurring from December to February and from July to September, respectively. Correlation between CH_4 flux and temperature and soil moisture differed with sampling sites. CH_4 flux is negatively correlated with temperature, especially as temperature below 10 degrees centigrade. Soil moisture became a primary factor in regulating the CH_4 uptake as temperature up10 degrees centigrade. As a whole, CH_4 concentrations in the soils decreased with depth. Spatial differences of depth profiles of CH_4 concentration within a site between different vegetables are smaller than those between different sites with a same vegetable, suggesting that soil characters are more important in regulating CH_4 oxidation rate than vegetable.