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Geochemical features and U-Pb ages of migmatites and granites from Foping dome in South Qinling belt, China

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Research on migmatites is helpful to understanding the crustal evolution of orogenic belt. Here we report the zircon U-Pb ages of migmatites sampled from Foping dome in South Qinling belt, China. Two different partial melting ages of 209Ma and 195Ma are obtained from migmatite samples in Longcaoping villages and Foping respectively. The protoliths characteristics are also diverse of igneous rock and graywacke combined with the mineral assemblage features. We also analyzed the U-Pb ages and geochemical features of low Mg# granites collected from Wulong pluton closed to Foping dome. These granites can be divided into two groups of high Sr/Y and low Sr/Y ratios. The U-Pb ages vary from 219 to 214Ma for high Sr/Y group and from 214 to 192Ma for low Sr/Y group. Major and trace elements features indicate the high Sr/Y and low Sr/Y granites originated from melting of thicken and normal crust. Field observation shows that the low Sr/Y granites occur close to the partial melting sites compared with high Sr/Y granites. In addition, the low Sr/Y granites exhibit the consistent ages with the partial melting age of adjacent migmatite. This close relationship may imply the variation of crust thickness and thermal overprints of orogenic crust during the post-collision stage. Following the collision of South Qinling and the Yangtze block prior to 219 Ma, partial melting of the deep crust occurred. The high Sr/Y granites were generated as the melting of thickened crust at the same time. Subsequently, partial melted deep crust migrated upward rapidly and caused collapse of the thickened crust and carried heat upward, leading to further partial melting within the shallower crust and formation of the low Sr/Y granites.