

The Variation of non-traditional Sr isotope in basaltic weathering profile from Hainan Island, China

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The weathering materiers were drilled from a Cenozoic basaltic weathering profile produced in Hainan Island, China. Major and trace elements and minerals were analyzed. The traditional $^{87}\text{Sr}/^{86}\text{Sr}$ ratio and non-traditional $^{88}\text{Sr}/^{86}\text{Sr}$ ratio ($\delta^{88}\text{Sr}$) were also measured using by MC-ICP-MS. Data show that the primary minerals, such as pyroxene, feldspar are gradually decomposed in the weathering profile from the bottom to the upper zone and, to the contrary, second minerals, such as montmorillonite, kaolinite are gradually increased. With the decomposition of primary minerals, the labile elements, such as K, Ca, Na, Mg, Rb, Sr et al, were released from the profile and moved into solutions. The data of traditional $^{87}\text{Sr}/^{86}\text{Sr}$ ratio in the weathering product indicate that radiogenic Sr isotope composition in weathering profile are also controlled by the mineral decomosition, especially feldspar. The non-traditional non-traditional $^{88}\text{Sr}/^{86}\text{Sr}$ ratio($\delta^{88}\text{Sr}$) were firstly reported in the weathering profile. $\delta^{88}\text{Sr}$ in the parent rock is 0.26, similar to those of mantle samples. In the whole weathering product, the vriation of $\delta^{88}\text{Sr}$ are positively correlated to the feldspar compositions, namely, high $\delta^{88}\text{Sr}$ values are existed in the weathering prduction with high feldspar composition, which suggests high mass ^{88}Sr are preferentially leached when the feldspar are decomposed. In the upper weathering profile without the primary minerals, the traditional $^{87}\text{Sr}/^{86}\text{Sr}$ ratio and non-traditional $\delta^{88}\text{Sr}$ are significantlty higher than these of the bottom weathering product, which Sr isotopes are mainly controlled by the process of Sr resorption into the second minerals.