

Variation of Os-Nd-Sr multi isotopic system within a loess-paleosol sequence from the Loess Plateau, China

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Rhenium-Osmium, Samarium-Neodymium and Rubidium-Strontium isotopic data were obtained for a loess-paleosol sequence from the Luochuan area in the Loess Plateau, China.

Loess and paleosol samples were collected from a cliff outcrop. The Luochuan area is the type locality of the loess study. The total thickness is ~140m and the maximum age at the base is ~2.5Ma. Samples in this study were collected from 2-70m depth, which maximum age is ~800ka. Part of the samples are identical with the samples analyzed in Gallet et al. (1996). Prior to isotopic analysis, the samples were leached by 5% acetic acid to remove secondary formed carbonate minerals during pedogenesis.

Ranges of $^{87}\text{Sr}/^{86}\text{Sr}$, $^{143}\text{Nd}/^{144}\text{Nd}$ and $^{187}\text{Os}/^{188}\text{Os}$ ratios are 0.7184-0.7207, 0.51208-0.51210 and 0.68-1.17, respectively. $^{87}\text{Sr}/^{86}\text{Sr}$ ratio is relatively low (~0.7188) at upper position (less than 10m depth) and becomes higher with depth (0.7194 at ~20m depth and 0.7199 at ~70m depth). Most of samples have $^{187}\text{Os}/^{188}\text{Os}$ ratios of 0.9-1.0. However, some samples have markedly low $^{187}\text{Os}/^{188}\text{Os}$ ratio (less than 0.8) or high $^{187}\text{Os}/^{188}\text{Os}$ ratio (higher than 1.1). Variation of $^{143}\text{Nd}/^{144}\text{Nd}$ ratios is within experimental errors. The variation of Sr and Os isotopic data may represent difference of source rather than pedogenesis, because there are no remarkably differences between loess and paleosol samples.