# Quantification of silicate weathering in Chinese Loess Plateau

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Most authors considered that chemical weathering only resulted in carbonate dissolution but did not alter silicate minerals evidently in Chinese Loess Plateau[1-2]. However, silicate weathering intensity in Chinese Loess Plateau is not quantified yet.

In this study, $^{87}Sr/^{86}Sr$ ratios of acid-soluble and acid-insoluble fractions (0.5M HOAc solution leaching) of eolian dust in the Lingtai section during the last 7Ma are determined to quantify chemical weathering intensity. Results display that $^{87}Sr/^{86}Sr$ ratios range between 0.7104 and 0.7116 for acid-soluble fractions, and vary from 0.7182 to 0.7234 for acid-insoluble fractions.

$^{87}Sr/^{86}Sr$ ratios of acid-soluble fractions in the Lingtai section are originally controlled by marine carbonate widely spreading over North China and eolian silicate weathering. So, the relative contribution of Sr released from silicate fractions due to chemical weathering in the Lingtai section can be calculated with a two-component mixing equation. One endmember is the silicate fraction and the other is marine carbonate. Acid-soluble fractions are assumed to represent silicate fractions with variable $^{87}Sr/^{86}Sr$ ratios in the past 7Ma. The mean Sr isotope ratio of marine carbonate is considered to be 0.708 during the Phanerozoic. The mixing equation is given as $^{87}Sr/^{86}Sr_{AS} = X\ ^{87}Sr/^{86}Sr_{AI} + (1-X)\ ^{87}Sr/^{86}Sr_{MC}$, where AS is the acid-soluble fraction, AI represents the silicate fraction, MC is marine carbonate, X is the relative contribution of silicate fractions, and (1-X) denotes the relative contribution of MC. Results show that whether the Quaternary loess or the Tertiary red clays, their acid-soluble fractions contain less than 30% Sr derived from chemical weathering of silicate fractions in the Lingtai section during the last 7Ma, and reveal weak chemical weathering in Chinese Loess Plateau.

**References**

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