Carbon, Oxygen and Strontium isotopic compositions of Lower to Middle Cambrian carbonates in the northwestern Tarim Basin, China

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The Keping area in the northwestern Tarim Basin (nothwest China) has a good outcrop Lower to Middle Cambrian section, which is composed mainly of carbonates. In this study, 110 carbonate samples were analyzed for stable carbon and oxygen isotopes, and 14 samples for radioactive $^{87}Sr/^{86}Sr$ isotopic ratios. The measured values generally have primary features of the rocks, as supported by two folds of evidences. First, the $\delta^{18}O$ values vary between -11.0‰ and -4.0‰ (PDB), averaging -5.8‰, greater than -10‰. Second, the $\delta^{13}C$ and $\delta^{18}O$ values have no clear positive correlation.

The $\delta^{13}C$ values rise from 1.4‰ to 3.3‰ (peak I) from the late Meishucunian to late Nangaoan, punctuated by several fluctuations. After the peak I, the $\delta^{13}C$ values decrease to peak III (-4.2‰) from the Duyunian to the base of the Taijiangian, punctuated by a less negative peak (peak II, -3.0‰). The peak III marks the Lower-Middle Cambrian boundary, which has good correlation with other regions, such as South China [1] and Laurentia [2]. The $\delta^{13}C$ values rise to around 0 during the later part of the Middle Cambrian.

The $^{87}Sr/^{86}Sr$ ratios exhibit a monotonic rise from the late Early Cambrian to Middle Cambrian, from ~0.7089 to ~0.7093. The rise of the $^{87}Sr/^{86}Sr$ ratios during this interval is interpreted to record uplift and attendant increased weathering associated with the Pan-African orogeny [3]. Subsequently, the $^{87}Sr/^{86}Sr$ ratios decrease to a minimum of ~0.7087 during the early Middle Cambrian, indicating an episode of widespread rifting [2].

The $^{87}Sr/^{86}Sr$ curve combined with the $\delta^{13}C$ curve defines the Early-Middle Cambrian boundary, which accords with the extinction of Redlichiid and Olenellid Trilobites.

Thus, the data here provide clues and references for global isotopic and geological events from the Lower to Middle Cambrian as to global stratigraphic correlation.

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[1] Zhu *et al.* (2004) *Geobios* **37**, 287–301. [2] Montañez *et al.* (2000) *GSA Today* **10(5)** 1–7. [3] Derry *et al.* (1994) *EPSL* **128**, 671–681.

Absorption/desorption of soil phosphorus mobilization in a small watershed, China

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Understanding the soil mobilization mechanism is critical in controlling the phosphorus entering the water body for mitigating and preventing eutrophication.

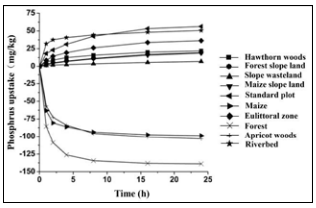

Figure 1: Soil P absorption curves

The dynamic curves of phosphorus adsorption can be well described with the two-constant dynamic equation. High phosphorus soil (TP > 0.9 mg·kg^{-1}) occurred desorption all the time. The adsorption amount of low phosphorus soil (TP < 0.588 mg·kg^{-1}) increased with increasing equilibrium concentration of solution. Absorption capacities of soil phosphorus were varied with different land use soil. The phosphorus absorption capacity of riverbed soil was the highest whereas that of slope grassland soil was the lowest. The main factors influencing the soil phosphorus absorption capacity were Clay, Fe-P, Al-P and Available Phosphorus (A.P.)[1-3]. The phosphorus releasing processes of high phosphorus soil occurred desorption all the time, which could be fit in well with by the dynamic equation. The phosphorus releasing processes of low phosphorus soil was an alternate dynamic process of adsorption - desorption, which could not be fit in well with by the dynamic equation. The soil phosphorus and clay content and water-soil ratio conditions affected desorption amount. With an increase in phosphorus solution concentration, soil phosphorus re-desorption capacity decreased gradually.

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[1] Borggaard & Jqrgensens (1990) *J. Soil Sci.* **41**, 443–449. [2] Amrani *et al.* (1999) *Commun Soil Sci. Plant. Anal.* **30**, 1299–1314. [3] Katarina *et al.* (2001) *Nutrient Cycling in Agroecosystems* **59**, 39–46.