Fluctuation of osmium isotope composition recorded in Cenozoic pelagic brown clay from the western North Pacific Ocean

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Osmium (Os) isotope composition in seawater has fluctuated through the Cenozoic era reflecting a balance between Os fluxes from riverine, hydrothermal, and extraterrestrial sources[1]. Thus, the seawater $^{187}Os/^{188}Os$ ratio recorded in deep-sea sediments have been used to understand past earth's environment [2]. Seawater $^{187}Os/^{188}Os$ curve reconstructed from robustly dated deep-sea sediments show a long-term increasing trend from the Eocene to present with several positive and negative shifts, some of which have been attributed to some geological events[2]. Another application of the seawater $^{187}Os/^{188}Os$ fluctuation is isotope stratigraphy. The features of seawater $^{187}Os/^{188}Os$ curve including the positive and negative shifts can help developing chronology of marine deposits whose ages are difficult to be determined by biostratigraphy and magnetostratigraphy. However, $^{187}Os/^{188}Os$ data are still sparse in some age intervals [2]. For a further understanding of the $^{187}Os/^{188}Os$ fluctuation in the Cenozoic, we measured seawater $^{187}Os/^{188}Os$ ratios recorded in a pelagic brown clay core, KR13-02 PC04, collected from the western North Pacific Ocean. The seawater $^{187}Os/^{188}Os$ ratio in the core top showed a comparable value to the present seawater of ~1 [3], and it gradually decreased towards the bottom. Then, it showed the minimum value at ~8 meters below seafloor. These features corresponded to those of the seawater curve from the Eocene to present. Thus, this core could continuously record depositional history from the Eocene to present.

References: [1] Peucker-Ehrenbrink, B, Ravizza, G. *Terra Nova* **12**, 205-219 (2000). [2] Peucker-Ehrenbrink, B., Ravizza, G. In *The Geologic Time Scale 2012*, 145-166 (2012). [3] Sharma, M et al. *Geochim. Cosmochim. Acta* **61**, 3287-3299 (1997).