Calcium isotope record of the Late Triassic

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The Ca isotope composition ($\delta^{44/40}Ca$) of Late Triassic – earliest Hettangian bulk carbonates from Austria were analyzed. During the Norian – early Hettangian interval only one significant change is observed. In the early Rhaetian, the $\delta^{44/40}Ca_{carb}$ isotope values display a ~0.6‰ negative shift. After this shift, the values remain quite stable and no rebound is documented during the studied interval and no further perturbation during the end-Triassic mass-extinction interval. This dataset fills a fraction of a long $\delta^{44/40}Ca$ data gap in the Triassic and Jurassic. Due to the small dataset during the Lower Jurassic, the question remains open when the $\delta^{44/40}Ca_{carb}$ values return, but the negative excursion lasted at least 4 Ma. Magnitude changes of the input fluxes are insufficient to explain this duration. This is supported by the interpretation of the contemporaneous $^{87}Sr/^{86}Sr$ ratio.

Negative excursions lasting less than 10 Ma are frequently observed during the Phanerozoic [1]. These oscillations may be related to increasing rate of dolomitization [1]. Alternatively, the observed magnitude of this shift is comparable to the documented Carboniferous transition between calcite and aragonite sea [2]. In the Late Mesozoic and Cenozoic, this transition is thought to have no significant effect on the $\delta^{44/40}Ca_{sw}$ evolution [2]. The boundary between these two "modes", when it plays a role or not, is not precisely constrained. These new data can contribute to define more precisely from what time on changes in fractionation factor of the carbonate sink has no significant role controlling the $\delta^{44/40}Ca_{sw}$ anymore.

[1] Farkaš et al. (2007) *Geochimica et Cosmochimica Acta* **71,** 5117–5134. [2] Blättler et al. (2012) *EPSL* **309,** 77-88.