

The impact of growth rate on trace-element and Li-isotope composition of inorganically precipitated calcium carbonates

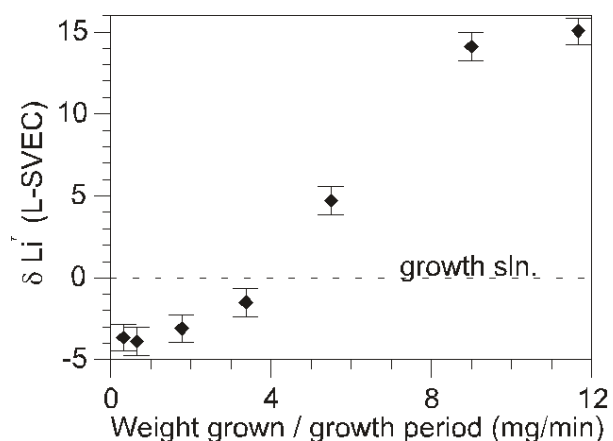
A.J. MASON¹ AND G.M. HENDERSON¹

¹ Department of Earth Sciences, University of Oxford, Parks Road, Oxford, OX2 6EH, UK. Tel: 01865 282123 ; e-mail: andrewm@earth.ox.ac.uk

Growth rate is an important control on the trace-element and isotope composition of inorganic and biogenic carbonates [1]. Growth rate is not itself generally an environmental variable of interest, but its potential to overprint chemical signals used for reconstruction of more important variables such as temperature or pCO₂ requires unstanding and possibly correction.

In this study we have grown calcium carbonates in the laboratory using a chemostat approach under carefully controlled conditions and at a variety of growth rates. Resulting samples allow an assessment of the role of growth rate in controlling the trace-element composition of a wide variety of trace elements including those commonly used in natural biological or inorganic sediments as paleoproxies.

We have also measured the C, O, and Li isotope composition of the grown carbonates. Li-isotope variation spans 20‰ (see figure), approximately half of the range observed in the natural environment. The cause of this large range of Li isotope variation is presently under investigation using mineralogical and chemical techniques. If this variation is more generally observed, Li isotopes in carbonates might provide information about growth rates in naturally occurring carbonates and form part of the suite of proxies applied to carbonate archives of past change.



References

[1] Lorens R. B. (1981) GCA **45**, 553 – 561.