
Emerging proxies in paleoceanography

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Résumé

This presentation will discuss two emerging areas of paleoceanography: clumped isotope thermometry and boron-based proxies for the carbon cycle. "Clumped-isotope" thermometry is a new field that is based on measurements of the proportion of ¹³C and ¹⁸O isotopes that are bound to each other within carbonate minerals in ¹³C¹⁸O¹⁶O₂ groups. Possible areas of application include constraining paleotemperature and water isotope changes to study both climate and sea level, which in turn influence sedimentary fluxes and sequences, and are necessary to constrain sediment transfer along margins. The clumped isotope tool can also be useful for studying the origin of cements and more broadly, diagenetic processes that influence sedimentary architecture. The refinement and application of boron-based tools, such as B/Ca and boron isotope ratios in carbonates, offers the potential to study changes in carbonate chemistry in the oceans. Boron-based proxies are thought to be useful for studying the carbon cycle, including constraining seawater pH and pCO₂. The proxies represent a potentially novel approach to studying the occurrence and changing character of carbonate factories throughout Earth's history, and their linkages to climate.

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