CHEMOSTRATIGRAPHY AND PALAEOTEMPERATURE EVOLUTION ACROSS THE TRIASSIC-JURASSIC BOUNDARY

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Carbon-isotope trends are useful tools for stratigraphic correlation, especially during times of major perturbation to the carbon cycle. For the Triassic-Jurassic boundary major perturbations have been documented, but carbon-isotope data only exist for bulk rocks. We have produced carbon and oxygen isotope values from well-preserved oysters with low-magnesium calcite shells that are relatively resistant to diagenetic alterations. These data are generated from Lavernock Point, a section closely adjacent to a candidate stratotype for the base of the Jurassic, at St Audrie's Bay (UK). The carbon isotope signature from St Audrie's Bay, previously defined on the basis of bulk organic matter analysis, is confirmed by our new data. We also have analysed bulk carbonate samples from Cs vár-quarry (Hungary), Kendelbachgraben (Austria), and Lime Regis (UK). These data sets, taken together, illustrate detailed features of the carbon isotope curve including: (1) the initial negative isotope excursion; (2) a pronounced positive excursion, and; (3) an extended main negative isotope excursion. Palaeotemperatures calculated from oxygen-isotope values from Lavernock Point oysters are relatively cool (9 to 15 degrees C) at the beginning of the positive carbon-isotope excursion, and shift to relatively warm values (20 to 27 degrees C) during the main negative carbon-isotope excursion. Our results are compatible with the idea that positive carbon isotope excursions correspond to times of low atmospheric carbon dioxide content, and negative carbon-isotope excursions correspond to times of high atmospheric carbon dioxide content.