



Do foraminifera accurately record seawater neodymium isotope composition?

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Palaeoclimate studies involving the reconstruction of past Atlantic meridional overturning circulation increasingly employ isotopes of neodymium (Nd), measured on a variety of sample media (Frank, 2002). In the open ocean, Nd isotopes are a conservative tracer of water mass mixing and are unaffected by biological and low-temperature fractionation processes (Piepgras and Wasserburg, 1987; Lacan and Jeandel, 2005). For decades, benthic foraminifera have been widely utilised in stable isotope and geochemical studies, but have only recently begun to be exploited as a widely distributed, high-resolution Nd isotope archive (Klevenz et al., 2008), potentially circumventing the difficulties associated with other methods used to recover past deep-water Nd isotopes (Klevenz et al., 2008; Rutberg et al., 2000; Tachikawa et al., 2004). Thus far, a single pilot study (Klevenz et al., 2008) has indicated that core-top sedimentary benthic foraminifera record a Nd isotope composition in agreement with the nearest available bottom seawater data, and has suggested that this archive is potentially useful on both millennial and million-year timescales.

Here we present seawater and proximal core-top foraminifer Nd isotope data for samples recovered during the 2008 “RETRO” cruise of the Marion Dufresne. The foraminifer samples comprise a depth-transect spanning 3000m of the water column in the Angola Basin and permit a direct comparison between high-resolution water column and core-top foraminiferal Nd isotope data. We use these data to assess the reliability of both planktonic and benthic foraminifera as recorders of water column neodymium isotope composition.

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