



## Revisiting diagenesis on the Ontong-Java Plateau: evidence for authigenic crust precipitation in *Globorotalia tumida*

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Foraminifera hold the key to the past climate of the Earth. They can be retrieved from core tops of sea floor sediments, allowing the record to extend back many thousands to millions of years. The time lag between the foraminifera formation, deposition, and the routine analysis can therefore be very long. The sites from which foraminifera are collected and cored experience different physicochemical conditions to those which they were formed and deposited in. The samples used in this study are from the Ontong-Java Plateau, west equatorial Pacific, and were studied in *Brown and Elderfield, 1996*. Synchrotron X-ray computed tomography (sXCT) and electron micro-probe analyses were carried out on samples collected from different core top depths, chosen to span the lysocline in the area, in order to re-asses the character and extent of diagenetic alteration. Previous work on *Globorotalia tumida* collected in the area (*Brown and Elderfield, 1996*) found that high-Mg calcite of the test is preferentially dissolved, leading to significantly reduced whole test Mg/Ca and Sr/Ca.

Dissolution of high-Mg calcite was directly observed using the sXCT, confirming previous work of *Brown and Elderfield, 1996*. In addition to this, the sXCT also exposed a thickening of external test walls with increasing core top depth, with further chemically and structurally distinct calcite present outside the periphery of the test. Electron micro-probe analyses revealed this new calcitic material to have a generally lower trace element composition than the original calcitic test. This suggests a dissolution of the internal high-Mg calcite, as well as diagenetic precipitation of calcite external to the test, generally lower in trace elements. This leads to the proposal of a closed-loop dissolution-precipitation model, which may be able to account for the phenomena and trends observed. This demonstrates the impact of two simultaneous diagenetic alteration processes, with notable impacts on resulting paleoproxy signals.