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Seven million year record of multiple geochemical proxies of planktonic foraminifera shells collected from marine sediment core (IODP Exp.361 Site U1476) after removal of clay and boron-specific contamination influences.

KAORU KUBOTA[1], TSUYOSHI ISHIKAWA[2], TOSHIHIRO YOSHIMURA[2], KATSUNORI KIMOTO[1], QING CHANG[1], MINORU IKEHARA[3], YUSUKE YOKOYAMA[4], FRANCISCO J. JIMENEZ-ESPEJO[5], SIDNEY R HEMMING[6], STEPHEN BARKER[7] AND IAN R. HALL[7]

[1]Japan Agency for Marine-Earth Science and Technology
[2]JAMSTEC
[3]Kochi University
[4]The University of Tokyo
[5]Consejo Superior de Investigaciones Científicas
[6]Lamont-Doherty Earth Observatory of Columbia University
[7]Cardiff University

Presenting Author: kaoryu0129@gmail.com

Planktonic foraminifera shells preserved in marine sediment are excellent archives to record long-term marine environment of the past. For instance, Mg/Ca ratio of the shell records sea surface temperature; boron isotope ratio ($\delta^{11}B$) records seawater pH, leading to wide application in paleoclimatology. However, these proxies are easily contaminated by clay which is a major constituent of marine sediment, thus accurate environmental reconstruction requires intense shell cleaning and data-screening of problematic data. Here we report seven million year record of multiple geochemical analyses (B/Ca, $\delta^{11}B$, $\delta^{13}C$, $\delta^{18}O$, Mg/Ca, Al/Ca, Sr/Ca, $^{87/86}Sr$、Ba/Ca) on planktonic foraminifera *Orblina universa* (size fraction: 500–850 μm) that were collected from marine sediment core recovered from the West Indian Ocean under the International Ocean Discovery Project Expedition 361 (Site U1476). We found that Al/Ca and Ba/Ca ratio are sensitive indices for clay contamination, and are effective for data screening. Various sources of boron contamination were also identified, allowing the removal of questionable data. As Mg/Ca ratio of the foraminifera shell showed a long-term increasing trend that overwhelms a secular change of Mg/Ca ratio of the seawater, we investigated both physical and geochemical features using SEM, Micro X-ray CT, and laser-ablation ICPMS. It revealed that the shell thickness became roughly one-half through the seven million years, implying a possibility that Mg incorporation mechanism has changed through time.