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SIT02-P02 Room:Poster Time:April 29 18:15-19:30

Pore fluid geochemistry and carbonates in cores and cuttings from the Nankai accretionary prism

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The recent IODP Exp 348 at Site C0002 has successfully deepened Hole C0002F (Exp 338) down to 3058.5 mbsf, deep into the accretionary prism of the Nankai Trough. During Exp 348, cuttings were collected and analysed from drilled interval of Holes C0002N (875 mbsf- 2325 mbsf) and C0002P (1965 mbsf- 3059 bsf) and limited coring was performed from 2163 to 2218 mbsf in Hole C0002P. The major-element composition of the solid cuttings and the geochemistry of interstitial water in cores was determined. Results provide insights into exchange of elements between minerals and pore water phases, and into geochemical signatures related to lithological changes within the prism. This study reports the main geochemical results from IODP Exp 348.

Interstitial waters were collected using the GRIND method (Wheat et al., 1994), in which core sediments were ground in an agate mill with ultra-pure water. The interstitial water percentage was determined by drying sediments at 60 ℃ and 105 ℃, the former to minimize loss of clay-bound water, and the latter to follow the GRIND procedure used in previous expeditions. Concentrations were interpreted with data corrected for dilution at 60 ℃, 105 ℃ and normalised to chlorinity values. Profiles of carbonates (as $CaCO_3$), organic carbon and total nitrogen were determined from cuttings of 1-4 mm and $>$4 mm sizes and are compared with the observed lithological boundaries. Carbonate veins were observed in a core sample exhibiting a fault zone at ?2205 mbsf, but no increase was observed at the same depth in the carbonates profile.

The GRIND method has limitations in recovering absolute values of dissolved ions in interstitial waters, and yielded very high dissolved-ion concentrations in some samples. But comparison of ions normalized to chlorinity yielded results comparable to what was observed in pore waters at shallower depths of Site C0002. Some of the trend variations in the cuttings profiles of carbonates, organic carbon and nitrogen match the unit boundaries determined by observation of lithological changes in the cuttings. Therefore, it can be suggested to integrate these data when defining geological units.

Wheat, Boulegue and Mottl (1994) Proc. ODP, Sci. Results, 139: College Station, TX (Ocean Drilling Program), 429-437

Keywords: Accretionary prism, GRIND method, IODP Expedition 348, Nankai Trough, Pore water