

## pH distributions in central and western equatorial Pacific observed in 1999 and 2001

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In order to describe the whole image of carbonate system in seawater from surface to deep water, we measured total hydrogen ion concentration index (pH) of water column in addition to total carbonates concentration (TCO<sub>2</sub>) and CO<sub>2</sub> partial pressure (pCO<sub>2</sub>). The pH measurement is based on spectrophotometric method described by Clayton et al. (1993) that use m-cresol purple indicator dye. The pH repeatability (standard deviation) estimated from duplicate measurements is 0.0007 now. Observations were conducted in January, November-December 1999 and January 2001 on board R/V Mirai that belongs to Japan Marine Science and Technology Center.

pH section along the equator from 145E to 170W above 200m depth showed boundary at the longitude 152 - 160E that corresponds to the east end of the western tropical Pacific warm water pool. pH values were higher than 8.12 in warm water pool while they were gradually decreasing from the boundary to the 170W into 8.00. TCO<sub>2</sub> distribution showed similar pattern, i.e. low TCO<sub>2</sub> in warm water pool and gradually increasing TCO<sub>2</sub> in the east of the boundary. In consequence, the total alkalinity (TA) calculated with the input of measured pH and TCO<sub>2</sub> was almost uniform value (2316 +/- 7 micro mol/kg) in the region described here both vertically and horizontally.

This result indicates that the processes that don't affect TA very much consumed CO<sub>2</sub> in subsurface water that flows from the east, where upwelling supplies TCO<sub>2</sub> and lowers pH. The dominant processes of CO<sub>2</sub> consumption in this region would be photosynthesis and gas exchange that doesn't affect TA very much. The deep water (more than 200m), whose TCO<sub>2</sub> and TA are high, would hardly get mixed with subsurface water.

As we tried to examine the annual change in pH distribution, we would like to show the result too.