True nature and reversal of coral reefs and foraminifera habitats through temporal dependence of surface oceans

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Surface ocean has shown weak base under atmosphere, but fresh waters are acidic at less than pH 7 under atmosphere. The reversible reaction of calcification and decalcification balanced reversible acid dissociation reaction. The calcifying reaction in coral reefs and foraminiferal habitats, and salty waters was carried out through acid dissociation reaction. (Ichikawa, Chemistry, Euro. J, 2007, **13**, 10176). Reversible reaction between calcification and decalcification in no homogeneous phase,
$Ca^{2+} + HCO_3^- = CaCO_3 + H^+$, (1)
is acid dissociation reaction through temporal and spatial dimensions in weakly basic states of ~8.0 < pH < ~8.4 at PCO2 < ~290ppm under no anthropogenic contribution; coral reefs may be oasis for their fishes. All the coordinates pointed out by atmospheric PCO2 and surface ocean pH were irregularly scattered at PCO2 > 290ppm under anthropogenic effect on surface ocean pH. The accidental fluctuation in individual coordinates of (PCO2, pH) was observed between ~1950yr and ~2000yr for coral reefs. It is uncertain that oversaturation of carbonate ion concentration was observed instead of mineral saturation, since the sustainable proton homeostasis in surface oceans is controlled by reversible acid dissociation reaction e.g. eqn. (1).

Keywords: surface ocean, reversal of pH, acid dissociation reaction, calcification/decalcification reaction, coral reefs, foraminifera habitats

