

Visualization of pH change around calcium carbonate crystals during dissolution and growth

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For the investigation of the growth and dissolution of calcium carbonate, CaCO_3 , it is important to understand how carbonate and bicarbonate ions behave in these processes. The pH monitoring of a solution during CaCO_3 growth or dissolution is a useful technique for this purpose, and actually in a number of the previous studies, the pH measurements of bulk solution during the growth have been performed. However, to clarify the detail process on the surface, especially the behavior of bicarbonate ions, regional change of pH just above the crystal surface should be monitored. Recently, we have started an attempt to visualize the distribution of pH around CaCO_3 crystals which inorganically grows or dissolves, by applying the method used for the research on the biogenic calcification of foraminifers. We have succeeded to detect the pH change near a dissolved calcite surface, which may provide new insights into both inorganic and biogenic formation mechanism of CaCO_3 .

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