

Immobilization of *Neisseria gonorrhoea* carbonic anhydrase using polyurethane foam for CO₂ capture and sequestration

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Various strategies for capturing and sequestering carbon dioxide (CO₂) are being suggested as the global warming is to increase. One of the researches actively studied is bovine carbonic anhydrase (bCA)-based CO₂ capture and sequestration. However, it is difficult to extract and expensive to produce bCA in large scale. This study examined another promising carbonic anhydrase originated from *Neisseria gonorrhoea* (*ngCA*) which catalyzes reversible hydration of CO₂. *ngCA* can be genetically mass-produced in *E-coli* system economically. The study focused on immobilizing *ngCA* for practical utilization. The research proceeded on the conversion of CO₂ into bicarbonate and precipitation of calcium carbonate by sequestration. The specific activity of *ngCA* was similar to that of bCA in CO₂ hydration. Precipitation being checked by scanning electron microscopic analysis, most calcium carbonate was calcite whose structure is a regular hexahedron that is the most stable morphology. *ngCA* was immobilized within polyurethane foam and checked its properties. It was concluded that immobilized *ngCA* is a stable and promising in capturing CO₂.