

Continuous hydrogen production by sulfate modulation in sulfur deprived *Chlamydomonas reinhardtii* culture

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We investigated continuous hydrogen production by sulfate re-addition after sulfur deprivation using green alga *Chlamydomonas reinhardtii*. Re-addition of small quantities of sulfate (0~120 μ M MgSO₄, final concentration) to cell suspensions results in an initial increase in culture density, an increase in rate of sulfate consumption, and an increase in the total amount of H₂ produced, up to an optimal concentration (~30 μ M MgSO₄). However, the addition of too much sulfur (above 60 μ M) was delayed the on set of hydrogen production and lowered the final yield of hydrogen production. Using these results, we attempted the continuous and sustained hydrogen production by cycling a single *C. reinhardtii* culture for up to 4 cycles. However, hydrogen productivity was shown to reduce as time passes due to high increase of pH. In order to solve this problem, we added HEPES buffer in the medium, resulted in hydrogen production increased.