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Using a photosynthetic bacterium as a biocatalyst for hydrogen production

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There is exceptional interest in biofuels as alternative fuel in particular biologically produced hydrogen. *Rhodospseudomonas palustris*, a purple non-sulphur bacterium is known to produce good yields of hydrogen during anaerobic, photoheterotrophic growth. It could act as a source for growth associated hydrogen production and as the biocatalyst for non-growth associated hydrogen production. In this study, we presented examples of both processes. We qualitatively and quantitatively analyzed and compared the hydrogen production performance for growth associated and non-growth associated hydrogen production. The hydrogen production rate and light conversion efficiency for the non-growth associated hydrogen production were about 24% higher than those for the growth associated hydrogen production. The glycerol conversion for both processes were similar and above 90%. However there was a significant difference in hydrogen selectivity for growth associated hydrogen production, the hydrogen selectivity was found to be $8.0 \pm 0.4\%$ while for non-growth associated hydrogen production it was $77.7 \pm 2.8\%$. Hence the glycerol to hydrogen yield for the non-growth associated hydrogen production was around 10 times of that for the growth associated hydrogen production. Through these analyses, we aimed to understand the mechanism of hydrogen production under both conditions and offer recommendations for industrial application.

Biography

Ning Xiao has completed her BA and MENG degrees in Chemical Engineering at the University of Cambridge at 2011. Then she worked on algae biodiesel project in a boutique engineering consultancy firm for a year before she started her PhD at the University of Cambridge in 2012. She also has some experience on holding conference on biofuels.

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