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Biological and chemical fixation of carbon dioxideJoon Ching Juan¹, Tau Chuan Ling¹, Pau Loke Show², Chin Wei Lai¹, Siew Moi Phang¹ and Chang Jo Shu³¹University of Malaya, Malaysia²University of Nottingham Malaysia Campus, Malaysia³National Cheng Kung University, Taiwan

There are still on-going debates on the role of carbon dioxide fixation technologies on climate change. Nevertheless, we could not disregard the strong correlation between carbon dioxide concentration and global warming. This scenario has induced many researchers not only to reduce the carbon dioxide emission but also utilize or fix carbon dioxide. Mainly two approaches which are biological and chemical have been aggressively developed for carbon dioxide fixation. The photoautotrophic cultivation of microalgae is the most promising biological method for carbon dioxide fixation and utilization. This is because the microalgal biomass can be further processed as feedstock for biofuel and bio-based chemicals production. We have made use of microalgal technologies to be integrated into wastewater treatment such as in the palm oil mill effluents. Meanwhile, the chemical pathways are: (i) utilization of carbon dioxide via catalytic conversion into fuel or chemical e.g., methanol and methane and (ii) fixation of carbon dioxide into certain matrix such as cement. Recently, photocatalytic conversion of carbon dioxide into methanol has gained much interest because the process is less energy intensive. Definitely there are many new technologies being developed, but the feasibility of this technology on a large scale should be carefully evaluated. The biological and chemical perspectives on future of carbon dioxide fixation and utilization are outlined.

Biography

Joon Ching Juan received his BSc in 2003 and PhD in 2007 from National University of Malaysia, Malaysia. Currently, he is an Associate Professor of Catalysis at Nanotechnology and Catalysis Research Centre, University of Malaya, Malaysia and also Senior Research Fellow (Adjunct) position at Monash University, Sunway Campus. Until now, he has managed to publish more than 100 publications, co-author four book chapters and his H-index is 20 (2017). He is the recipient of several awards including, Malaysia's Research Star Award (2017) and National Young Scientist Award (2016).

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