

Design and applications of photobioreactors - A review

Sirohi, Ranjna^{a, b}; Kumar Pandey, Ashutosh^{b, c}; Ranganathan, Panneerselvam^d; Singh, Shikhangi^e; Udayan, Aswathy^f; Kumar Awasthi, Mukesh^g; Hoang, Anh Tuan^h; Chilakamarri, Chaitanya Reddyⁱ; Kim, Sang Hyoun^c;

^a Department of Chemical & Biological Engineering, Korea University, Seoul, 136713, South Korea

^b Centre for Energy and Environmental Sustainability, Lucknow, 226 029, India

^c Department of Civil and Environmental Engineering, Yonsei University, Seoul, South Korea

^d Department of Chemical Engineering, National Institute of Technology, Calicut, India

^e Department of Postharvest Processing and Food Engineering, GB Pant University of Agriculture and Technology, Pantnagar, India

^f Department of Chemical Engineering, Hanyang University, Seoul, South Korea

^g College of Natural Resources and Environment, Northwest A&F University, Shaanxi Province, Yangling, 712100, China

^h Institute of Engineering, HUTECH University, Ho Chi Minh City, Viet Nam

ⁱ Faculty of Chemical and Process Engineering Technology, Universiti Malaysia Pahang, Gambang, 26300, Malaysia

ABSTRACT

There has been increasing attention in recent years on the use of photobioreactors for various biotechnological applications, especially for the cultivation of microalgae. Photobioreactors-based production of photosynthetic microorganisms furnish several advantages as minimising toxicity and providing improved conditions. However, the designing and scaling-up of photobioreactors (PBRs) remain a challenge. Due to huge capital investment and operating cost, there is a deficiency of suitable PBRs for development of photosynthetic microorganisms on large-scale. It is, therefore, highly desirable to understand the current state-of-the-art PBRs, their advantages and limitations so as to classify different PBRs as per their most suited applications. This review provides a holistic overview of the discreet features of diverse PBR designs and their purpose in microalgae growth and biohydrogen production and also summarizes the recent development in use of hybrid PBRs to increase their working efficiency and overall economics of their operation for the production of value-added products.

KEYWORDS

Biohydrogen; Design; Microalgae; Photobioreactors

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