

Design of Energy Efficient Temperature Control Module for Enclosed Microalgae Growth system

박건희, 이 옹, 한중훈^{1,*}
서울대학교; ¹서울대학교 화학생물공학부
(chhan@snu.ac.kr*)

Microalgal culturing is one of the most effective methods for CO₂ reduction by assimilating CO₂ through photosynthesis. Aside from the CO₂ reduction, the enclosed microalgae culturing system also has advantages such as the production of valuable substances, for instance, Astaxanthin and Carotinoid. However, the major challenge of the large-scale of microalgal culturing is the control of solar irradiance and temperature. Microalgae cultivation temperature control methods should also be energy efficient in order to be satisfied CO₂ reduction target and economical operation. In this study, several temperature control methods such as water bath, water spraying, dessicant cooling, continuous circulation in HX have been investigated. Among these methods, water spraying method turns out to be the most energy efficient temperature control method for enclosed PBR system.

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