

Temperature Management System of Open Raceway Pond for Improving Microalgal Cultivation Stage

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As global warming issues have been increasing, biomass which is one of the renewable energy sources is capturing researcher's attentions. Microalgae is a promising biomass among them, because it has several advantages such as higher growth rate. However, the microalgal cultivation cannot produce mass biomass because of technical and economic hurdles. Especially, in open raceway pond (ORP) which has large potential of mass production due to low operating costs and easy scalability, a growing condition is usually unsuitable. So, ORP usually has poor productivity than other cultivation methods. Among parameters related to the growing conditions, a cultural temperature is one of the most influential factors on the microalgae growth. A temperature control may be a solution of the low productivity problem by adjusting the pond temperature for enhancing the microalgae growth. To this end, in this work, numerical simulations are performed to investigate the effects of temperature management system which uses waste cooling water as extra heat source, and then identify a relationship between a heat exchanger area and an increasing productivity for deeper understanding of this system.