

Renewable Microalgal Biomass Production using Seawater as the Source of Nutrition

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Biodiesel from microalgae is one of the alternatives to fossil fuels. Microalgae require nitrogen, phosphorus, etc. for growth. The ocean contains sufficient amounts of the nutrients but at low concentrations. Selectively permeable materials (SPMs), which transmit nutrients while containing microalgae, were used in constructions of photobioreactors (PBRs) to grow microalgae with nutrients dissolved in seawater. A marine microalga, *Tetraselmis* sp. KCTC12432BP, was cultivated in SPM-PBRs deployed in raceways filled with seawater from Incheon. A specific biomass productivity up to 12 g/m²/d was achieved. Weather conditions had significant effects on the biomass productivity. High cloud cover especially limited growth of microalgae. The results indicate that microalgal biomass can be produced using seawater as the sole source of nutrients, providing another renewable way to cultivate microalgae. Scaling-up and ocean deployment of the SPM-PBR system is in progress as the further studies.