

The newly designed transparent airlift photobioreactor for increasing areal productivity of microalgae based CO₂ bio-conversion process

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The aim of this work was to develop a photobioreactor which has high areal productivity for increasing biomass and lipid production in microalgal cultivation. To accomplish economic microalgae mass production, lower investment cost is essential. Tubular reactors have widely used to cultivate microalgae in large quantity. However, higher investment and maintenance cost is an obstacle to economic cultivation process. Therefore, we developed low cost film bag reactor. Film bag reactor has advantage of cost, but its smaller volumetric capacity that comes from weak mechanical strength is main limitation. To overcome this problem, baffles were introduced to increase column size safely. In addition, spacer was devised to link film bags for single large volume reactor. By using this advanced polymer bag reactor, areal productivity of biofuel was greatly increased and easy scale up of photobioreactor was done. Thus, we expect that economic mass production of microalgal fuel becomes feasible.