Energy efficient harvesting of Spirulina sp. from the growth medium using a tilted panel membrane filtration

ABSTRACT

Membrane fouling is one of the main drawbacks in membrane-based microalgae harvesting. This study assessed the tilted panel to enhance filtration performance of *Spirulina sp*. broth. The influences of the operating parameters including the tilting angle, aeration rate and membrane materials on filtration performance and energy consumption were evaluated. Results showed that the system was effective and energy-efficient for membrane fouling control. The permeability peaked at a tilting of 45° thanks to combination of aeration and panel tilting. The microfiltration performed better than the ultrafiltration membrane due to the effective impact of air bubbles for foulant scouring that maximized the membrane intrinsic property. Small aeration rate of 1.0 L/min offered a high plateau permeability of 540 L/(m^2·hr·bar) in which reversible fouling almost fully absent. The high permeability could be achieved under a low energy input of 0.2 kWh/m^3.