以碳酸鈉與碳酸氫鈉為碳源於連續式光生化反應器培養周氏扁藻

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摘 要

本研究利用明暗雙槽式光生化反應器，以碳酸鈉與碳酸氫鈉水溶液培養周氏扁藻(Tetraselmis chui)達到轉化二氧化碳為藻體生質濃度的動力。連續培養周氏扁藻於明暗循環光生化反應器中改變各 項因子，實驗結果如下：⑴ 碳酸氫鈉濃度對周氏扁藻生長之影響 以濃度3~10g/L的碳酸氫鈉為碳源進行培養，對於周氏扁藻的生長並未有顯著差異。於明亮區所 獲得之藻體生質濃度與比生長速率變化分別為0.245g/L與0.053h-1，而在黑暗區則分別為 0.174g/L與0.039h-1。而在培養液pH方面，由於HCO3-的緩衝力使碳酸氫鈉濃度較高者培養液 pH反而較低。⑵ 光強度對周氏扁藻生長之影響 以光強度10000~50000Lux進行培養，判定當光強度為30000Lux時已達光飽和，並以此光強度進行 其餘實驗。光飽和時藻體生質濃度在明暗兩區間分別為0.21g/L與0.16g/L，比生長速率速率與比 呼吸速率則分別為0.056、0.038h-1。⑶ 稀釋速率對周氏扁藻生長之影響 在外部稀釋範圍0.033～0.099h-1連續培養發現以下幾點：稀釋速率的增加同時比生長速率與比呼 吸速率也跟著增加，但藻體生質濃度與培養液pH卻是逐漸減少的。比生長速率增加會伴隨著比呼 吸速率的增加，但二者並非線性關係。培養液pH的提高使HCO3-減少，使比生長速率與比呼吸速率 反而降低。⑷ 曝氣條件對周氏扁藻生長之影響 曝氣條件下以稀釋範圍0.033～0.096h-1連續培養除了在明亮區溶氧的大幅下降外，其餘生長趨勢 大致相同，以及在曝氣條件下藻體生質濃度低於未進行曝氣培養。

關鍵詞 : 二氧化碳 ; 明暗雙槽式光生化反應器 ; 碳源

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