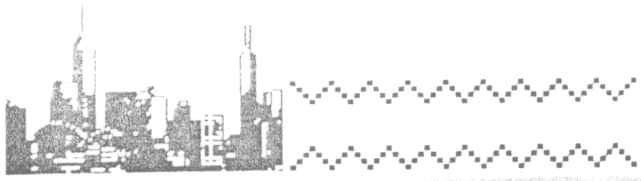
PROGRAMME AND ABSTRACTS



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HOLLOW FIBRE MODULES FOR CO_2 TRANSFER IN MICROALGAL CULTURES

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ABSTRACT

Light and dissolved carbon dioxide are often considered limiting factors of the metabolic efficiency of microalgae because they are usually difficult to control in a culture. The latter is usually provided via bubbling of CO_2-enriched air into the culture; however, this procedure leads to considerable waste of that gas to the open atmosphere, a fact that adds considerably to operating costs. The alternative use of microporous membranes in hollow-fibre form was tested; this configuration is likely to increase the interfacial area of contact available for gas exchange. Two membrane materials (polypropylene and polysulphone) were compared, in terms of mass transfer, with the traditional bubbling system. Overall mass transfer coefficients (K_l a) for CO_2 ranged between 1.48×10^{-2} min^{-1} for the hydrophobic membrane, 1.33×10^{-2} min^{-1} for the hydrophilic membrane, and 0.70×10^{-2} min^{-1} for plain bubbling.

Cultures of *Nannochloropsis* sp. were cultivated with CO_2 supplied via bubbling, as well as via both membrane configurations. Experimental results showed no significant increases in biomass productivity (relative to bubbling) when the hollow-fibre devices were used. However, hollow-fibre devices possess the intrinsic advantage that they allow recirculation of CO_2, thus reducing operating costs.