Biofixation of CO$_2$ from Synthetic Combustion Gas Using Cultivated Microalgae in Three-Stage Serial Tubular Photobioreactors

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Z. Naturforsch. 66c, 313–318 (2011); received September 13, 2010/January 14, 2011

Coal is the most abundant of the fossil fuels, with reserves estimated at $10^2$ billions of tons. The feasibility of using coal as a fuel depends upon reducing emissions of gas when it is burnt, such as carbon dioxide (CO$_2$), sulfur oxides (SO$_x$), and nitrogen oxides (NO$_x$). The removal of CO$_2$ with microalgae may be one of the most efficient ways of reducing this gas, without the need for radical changes in the world’s energy supply and production methods. *Spirulina* sp. LEB-18 and *Scenedesmus obliquus* LEB-22 were cultivated in serial tubular photobioreactors, with the aim of measuring the potential of CO$_2$ biofixation and the resistance of the microalgae to SO$_2$ and NO. *Spirulina* sp. and *S. obliquus* had CO$_2$ biofixation scores of 0.27 and 0.22 g L$^{-1}$ d$^{-1}$, respectively. Both microalgae were resistant to SO$_2$ and NO, and grew during the 15 d they were cultivated, which proves that using microalgae is an efficient method of biofixation of CO$_2$ emitted when fossil fuels are burnt.

Key words: Carbon Dioxide, Microalgae, Photobioreactor