

Carbon Sequestration Through Solar Bioreactors: Industrial Strategies

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Carbon Utilization

2017, 143-155

A promising biological solution for the utilization and conversion of CO₂ from a power plant into viable economic products has been discussed in this study. Algae grow well on a high concentration of carbon dioxide and nitrogen dioxide. These pollutants which are released by automobiles, cement plants, breweries, fertilizer plants, steel plant can serve as nutrients for the algae growth. The biotechnology of microalgae production can be divided into the following different types as cultivation systems, ponds and Photobioreactors as closed system with associated harvesting and processing equipment and the wetware as the specific algae species and strains are being cultivated. Algae when used for reducing the carbon dioxide concentration in the atmosphere are known as algae-based Capture technology. The algae-growing facilities when fed with the exhaust gases from these plants to significantly increase the algal productivity and reduce the pollutants from atmosphere. Additionally the oil found in algae can be processed into a biodiesel or green fuel. Additional products from algae includes ethanol and livestock feed. This technology offers a safe and sustainable solution to the problems associated with global warming. The value-added products that can be produced from these four main technologies are biomass with both low and high grade, biomass derived products as pharmaceutical, chemical or nutritional, synthesis gas as methanol, fuel and chemical production, speciality products as extracted using supercritical technology, organic carbonates as linear, cyclic or polycarbonates, carboxylates as formic acid, oxalic acid, etc. along with salicylic acid and urea.