Optimization of Algal Biomass Production under Salt Water Conditions

Shiroma, Lindsay

Tsou, Min

As the world’s dependence on the depleting sources of fossil fuels increase, scientists are beginning to look into algae as viable alternative energy sources. Algae can produce the necessary amount of biodiesel to release America’s dependence from fossil fuels. However, using sources of freshwater to cultivate algae is not environmentally sustainable. In order to increase algae biomass yield, a photobioreactor system will be built to cultivate the algae in various nutrient levels of nitrogen and phosphorous in the water. The photobioreactor system provides carbon dioxide along with oxygen to the individual bottles as well as light and heat energy to stimulate growth. Nannochloropsis Oculata saltwater algae then is prepared in nutrient concentrations ranging from 0.2-1.2 mg/ml with 3 trials each. After a period of two weeks, the algae is tested for gravimetric biomass content determine the amount of nutrients most efficient for biomass growth. That produced the following result: the 1.0 mg/ml sodium nitrate group yields the most biomass growth while the 0.4 mg/ml sodium phosphate group had the least biomass growth. For the phosphate group, the 0.8 mg/ml group had the most biomass group and the 0.4 mg/ml group had the least growth. Statistical analysis also shows that the groups with the highest growth of biomass in both nitrate and phosphate had the most precise set of data.

Awards Won: