CLAIMS

What is claimed is:

1. A method of culturing *Chlorella* in non-axenic mixotrophic culture conditions, comprising inoculating an aqueous culture medium with a culture comprising *Chlorella* in an open culturing vessel in the presence of:
    a. light comprising photosynthetically active radiation (PAR);
    b. an organic carbon source comprising at least one selected from the group consisting of acetic acid, acetate, and acetic anhydride, at a concentration in the range of 15-50% (v/v);
    c. a pH in the range of 6-9;
    d. an initial concentration of sodium acetate, sodium hydroxide, or potassium hydroxide in the range of 0.05-10 g/L; and
    e. a dissolved oxygen (DO) concentration in the range of 1-6 mg O_2/Liter of culture.
2. The method of claim 1, the method further comprising controlling temperature of the culture with heating and cooling to maintain the temperature within the range of 10-30°C.
3. The method of claim 1, wherein the organic carbon source comprises acetic acid and further comprises a second organic carbon component comprising propionic acid.
4. The method of claim 3, wherein the organic carbon source comprises acetic acid and propionic acid in an acetic acid:propionic acid ratio in the range of 10:0.01 to 10:2.
5. The method of claim 1, wherein the organic carbon source further comprises the organic carbon source in combination with at least one additional nutrient comprising at least one selected from the group consisting of nitrates and phosphates.
6. The method of claim 5, wherein the organic carbon source in combination with at least one additional nutrient comprises acetic acid and NO_3 in an acetic acid: NO_3 ratio of 10:0.5 to 10:2.
7. The method of claim 1, wherein the inoculation density of *Chlorella* in the culture comprises 0.3-0.5 g/L.
8. The method of claim 1, wherein the volume of the culture is at least 500 liters.
9. The method of claim 1, the method further comprising harvesting *Chlorella* from the culture on a periodic basis once the density of *Chlorella* in the culture reaches a threshold density of 5 g/l.

10. The method of claim 1, wherein the initial concentration of sodium acetate, sodium hydroxide, or potassium hydroxide is in the range of 1-6 g/l.
11. The method of claim 1, wherein the organic carbon is supplied by a pH auxostat system with a set point in the range of 6-9.
12. The method of claim 1, wherein the initial concentration of sodium acetate, sodium hydroxide, or potassium hydroxide is supplied for the first 1-5 days after the culture is inoculated.

CLAIMS

1. A method of culturing Chlorella in non-axenic mixotrophic culture conditions, comprising
a. inoculating an aqueous culture medium with a culture comprising Chlorella in an open culturing vessel;
b. supplying light comprising photosynthetically active radiation (PAR) in a photoperiod in the range of 10-16 hours;
c. activating a pH auxostat system with an initial concentration of sodium acetate in the range of 0.05-10 g/L in the aqueous culture medium to start supplying acetic acid at a concentration in the range of 15-50% (v/v) to the culture comprising Chlorella, wherein the pH auxostat system operates with a pH set point in the range of 6-9; and
d. maintaining a dissolved oxygen (DO) concentration in the range of 1-6 mg O_2/Liter ~~of culture~~.

2. The method of claim 1, the method further comprising controlling temperature of the culture with heating and cooling to maintain the temperature within the range of 10-30°C.

3. The method of claim 1, wherein the supplied acetic acid is mixed with a second organic carbon component comprising propionic acid.

4. The method of claim 3, wherein the acetic acid and propionic acid mixture further comprises acetic acid and propionic acid in an acetic acid:propionic acid g/L ratio in the range of 10:0.01 to 10:2.

5. The method of claim 1, wherein the supplied acetic acid is mixed with at least one additional nutrient comprising at least one selected from the group consisting of nitrates and phosphates.

6. The method of claim 5, wherein the acetic acid and at least one additional nutrient mixture comprises acetic acid and NO_3 in an acetic acid: NO_3 g/L ratio of 10:0.5 to 10:2.

7. The method of claim 1, wherein the inoculation density of Chlorella in the culture comprises 0.3-0.5 g/L.

8. The method of claim 1, wherein the volume of the culture is at least 500 liters.

9. The method of claim 1, the method further comprising harvesting Chlorella from the culture on a periodic basis once the density of Chlorella in the culture reaches a threshold density of 5 g/L.

10. The method of claim 1, wherein the initial concentration of sodium acetate, sodium hydroxide, or potassium hydroxide is in the range of 1-6 g/L.

11. The method of claim 1, wherein the initial concentration of sodium acetate, is supplied for the first 1-5 days after the culture is inoculated.