Effects of Temperature and Ph on the Kinetic Growth of Unialga Chlorella Vulgaris Cultures Containing Bacteria

Author(s)

A.W. Mayo

Abstract

The kinetic growth of unialga Chlorella vulgaris was investigated in mixed-culture fed-batch chemostat reactors, with special reference to temperature and pH. The experiments were carried out at 10 degrees C to 40 degrees C, pH was controlled from 3.0 to 11.5 in a series of reactors, and glucose at a concentration of 75 mg/L was fed as the sole source of organic carbon. The maximum growth rate of 0.50 day(-1) was obtained at pH of about 6.31 to 6.84, and the optimum temperature was 32.4 degrees C. The activation energy of the growth-limiting reaction and the enthalpy change for the enzyme-inactivation reaction were 24.5 and 253.36 kJ/mole, respectively. The saturation constants for hydrogen ion, K-H, and hydroxyl ion, K-OH, were temperature-dependent. At temperatures below optimum, K-H increased when temperature increased, but K-OH decreased. Above the optimum temperature, K-H decreased and K-OH increased with temperature.