ABSTRACT

BIOLOGICAL AND CHEMICAL PROCESS UTILIZING CHEMOAUTOTROPHIC MICROORGANISMS FOR THE CHEMOSYTHETIC FIXATION OF CARBON DIOXIDE AND/OR OTHER INORGANIC CARBON SOURCES INTO ORGANIC COMPOUNDS, AND THE GENERATION OF ADDITIONAL USEFUL PRODUCTS

The invention described herein presents compositions and methods for a multistep biological and chemical process for the capture and conversion of carbon dioxide and/or other forms of inorganic carbon into organic chemicals including biofuels or other useful industrial, chemical, pharmaceutical, or biomass products. One or more process steps utilizes chemoautotrophic microorganisms to fix inorganic carbon into organic compounds through chemosynthesis. An additional feature described are process steps whereby electron donors used for the chemosynthetic fixation of carbon are generated by chemical or electrochemical means, or are produced from inorganic or waste sources. An additional feature described are process steps for the recovery of useful chemicals produced by the carbon dioxide capture and conversion process, both from chemosynthetic reaction steps, as well as from non-biological reaction steps.

FIG.1