

VERTICAL CONTINUOUS MULTIPHASE REACTOR FOR THE CLEAN PRODUCTION OF HYDROCARBONS AND ENERGY AND THERMOCHEMICAL METHOD CARRIED OUT

ABSTRACT

Disclosed is a reactor and method for thermochemically degrading wet biomass without the need for prior drying, in particular microalga-rich substrates. The invention provides a vertical continuous multiphase reactor (VCMR) that simultaneously, progressively and continuously carries out the steps of evaporation, pyrolysis, gasification and combustion, in separate chambers, using indirect heating. The reactor operates at pressures below atmospheric pressure to increase thermal and productive efficiency, using a fraction of the same products as fuel to achieve thermal self-sufficiency. A system for instant evaporation at low temperature by means of adiabatic expansion is used. The reactor has high efficiency and high yield, requiring minimum space, and can be movable. The products obtained from the reactor are synthesis gas, biocarbon and bio-oils, with uses in energy, agriculture, cosmetics, health and construction. The invention also provides a method for obtaining hydrocarbons and energy from high-moisture biomass, wherein the steps are carried out continuously and the method does not need to be interrupted to add new wet biomass for conversion.

[Fig. 3]