

ABSTRACT

PROCESS FOR SOLID-STATE METHANE FERMENTATION OF BIOMASS MATERIALS AND FERMENTATION APPARATUS SYSTEM THEREFOR

A process for producing a biogas by solid-state fermentation of a solid biomass material which comprises the steps of:

- (1) pelletizing the biomass material into pellets;
- (2) introducing the pellets into an acid fermentation zone;
- (3) subjecting the biomass material in the pellets to solid-state acid fermentation under facultative anaerobic conditions or under semi-aerobic conditions kept in an oxygen concentration of 0.01% to 5.0%;
- (4) densifying the pellets by compression to remove the oxygen from among the particles of the biomass material;
- (5) transferring the densified pellets into a methane fermentation zone; and
- (6) subjecting the biomass material in the densified pellets to methane fermentation in the methane fermentation zone under anaerobic conditions, and

an apparatus system for producing a biogas by solid-state fermentation of a solid biomass material which comprises: an acid fermentation tank (7) having a means for pelletization (4) of the solid biomass material and an air inlet (25) with a movable valve; and a methane fermentation tank (11) having a pellet compressing means (12) connected to the acid fermentation tank (11) through a movable valve (9) for separation.

Selected Drawing: Fig. 1