

APPARATUS AND METHOD FOR INCREASING BIOMASS PYROLYSIS AND GAS PRODUCTION SPEED AND OBTAINING NANO-SCALE SILICA MATERIAL

ABSTRACT

The present invention provides an apparatus and a method for increasing a biomass pyrolysis and gas production speed and obtaining a nano-scale silica material. The apparatus comprises a spiral feeding apparatus, a pretreatment stirrer, a pyrolysis apparatus, a combustion apparatus, a steam generator and a calcination apparatus. A biomass raw material is sent to the pretreatment stirrer through the spiral feeding apparatus. The biomass raw material after stirring is mixed with superheated steam generated by the steam generator and enters the pyrolysis apparatus. Combustible gas separated out from the pyrolysis apparatus enters the combustion apparatus for combustion. Hot flue gas generated by combustion in the combustion apparatus heats the steam generator to generate the superheated steam. Ash discharged from an ash outlet in a lower part of the pyrolysis apparatus enters the calcination apparatus for calcination. The present invention uses the superheated steam to heat and dry the biomass raw material, and is faster than a dry speed of a method where the biomass raw material is dried by hot air in a same temperature, thus greatly increasing a pyrolysis gas separating-out speed of a system compared with a pyrolysis gas separating-out speed of a conventional system and a heat value of produced gas.

Fig. 1