

Hydrogen gas production method and equipment

No need of pulverization process! Able to product easily the hydrogen gas at low cost!

Overview

Conventional method of producing hydrogen gas from organic matters such as biomass or plastics, is composed of mixing calcium hydroxide and nickel hydroxide, applying mechanochemical processing (grinding), and then heating. However, since the pulverization process requires energy and equipment, technology development with further cost reduction was expected.

This invention is about a method of producing hydrogen gas from organic materials such as biomass and plastics at low cost without requiring a grinding process.

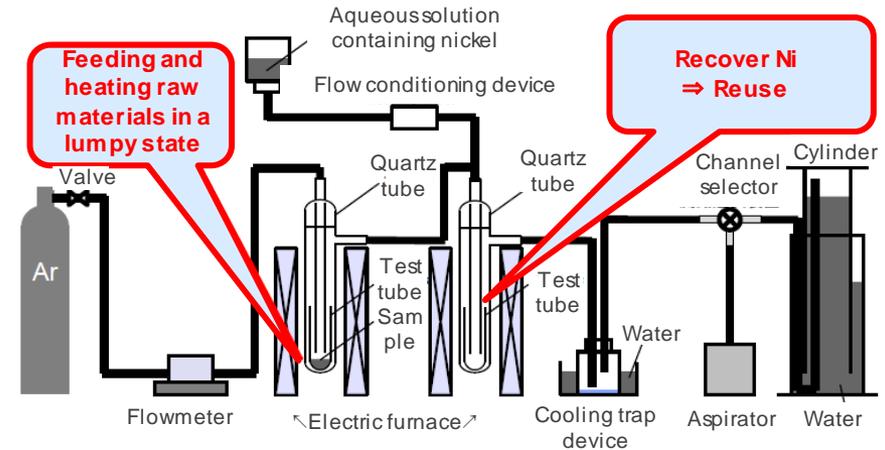
Organic materials such as biomass and plastics are pyrolyzed in a lumpy state to generate pyrolysis gas, and then this gas is heated with an aqueous solution containing nickel to generate hydrogen gas. In addition, the nickel added during heating can be recovered and reused.

Application

- Installation in a garbage disposal plant → Dispose waste and household garbage as it is

IP Data

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Effect

- Reduce production costs due to no required grinding process
- Able to heat and process biomass and plastics in lumpy form
- Able to recover and reuse nickel

Table: implementation conditions and hydrogen production quantity

Raw materials[g] (Polypropylene centrifuge tube container)	1.1
Heating condition	600°C 1hour
Nickel acetate solution [ml] 10000ppm	18 (1drop 10seconds)
Amount of generated gas[ml] *Carrier gas included	2100
Hydrogen concentration [%]	40.5
Quantity of hydrogen produced per 1kg of raw material [g/kg]	60.5

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