

Teaser Memorandum

Biocoats Co.,Ltd

Preparation of sweet potato pulp anthracite blended briquettes

Executive Summary

Biocoats Co.,Ltd established in Feb. 2003.

The major interest of Biocoat is development of health supplement food, foodstuff, active packaging, micro-encapsulation and environment-friendly substances such as biodegradable Films/Plastics and functional Biomaterials. We cooperate with Korea university (Korea), The Ocean university in China, Clemson University and The University of Georgia (USA).

Our main research field is to develop alternative fuel and biopolymers through environment-friendly method and material as follows: Advanced extrusion technique of biopolymer mixtures, using plasticizer for saving energy (low-heat, less-press: low energy), technique for preparing the multi-pore structure for high-level thermal efficiency and Active packaging technique for biopolymer briquettes.

Industry Sector: Food&Agriculture/ Manufacturing Process /Environment-friendly fuel

Therapeutic Target: N/A

State of Development: preparation of prototype

Key Technology Highlights

□ **technology of economic and environment-friendly alternative fuel:**
our technology is able to reduce cost of preparing briquette and increase heat efficiency by preparing at relatively low pressure and temperature choosing cross-linker

□ **blending technology of recycled or byproduct biomaterial:**
our technology is able to apply the agricultural wastes like sweet potato pulp, for example, briquette prepared by changing mixing ratio with sweet potato pulp and anthracite

■ IP Owner Summary

- **Name:** Cha, Dongsu
- **Present Position:**
CEO of Biocoats Co.,Ltd
- **Office address:**
239-85, Junggok1-dong, Gwangjin-gu, Seoul, Korea, 143-903

■ Personal Description of Researcher

- **Name:** Cha, Dongsu
- **Present Position:** CEO
- **Major:**
Packaging Science/ Food Microbiology
- **Research interest:**
Application of biopolymers/
Antimicrobial Packaging
- **Office address:**
239-85, Junggok1-dong, Gwangjin-gu, Seoul, Korea, 143-903

■ Market Feasibility

- **Korean and Global market size:**
Korean market: 52 million USD
Global market: 8.5 billion USD
- **Korean and Global market opportunity (competitors and competing product):**
Southern Asia countries and China products

■ Trend & Partnership

- **Future outlook and trends related to technology:**
Green-business/Biodegradable packaging
- **Technology Transfer and Commercialization conditions:**
To have preparation system, and transfer main technology
- **Type of business relationship sought (including licensing availability):**
Hope to connect energy-industry

Technology Overview

■ Technology Platform

Our core technology is to prepare various product by changing mixing ratio with recycled material like sweet potato pulp and anthracite and has synergic effect on heat efficiency of pure anthracite. For example, process of blended briquette is shown as following figure.

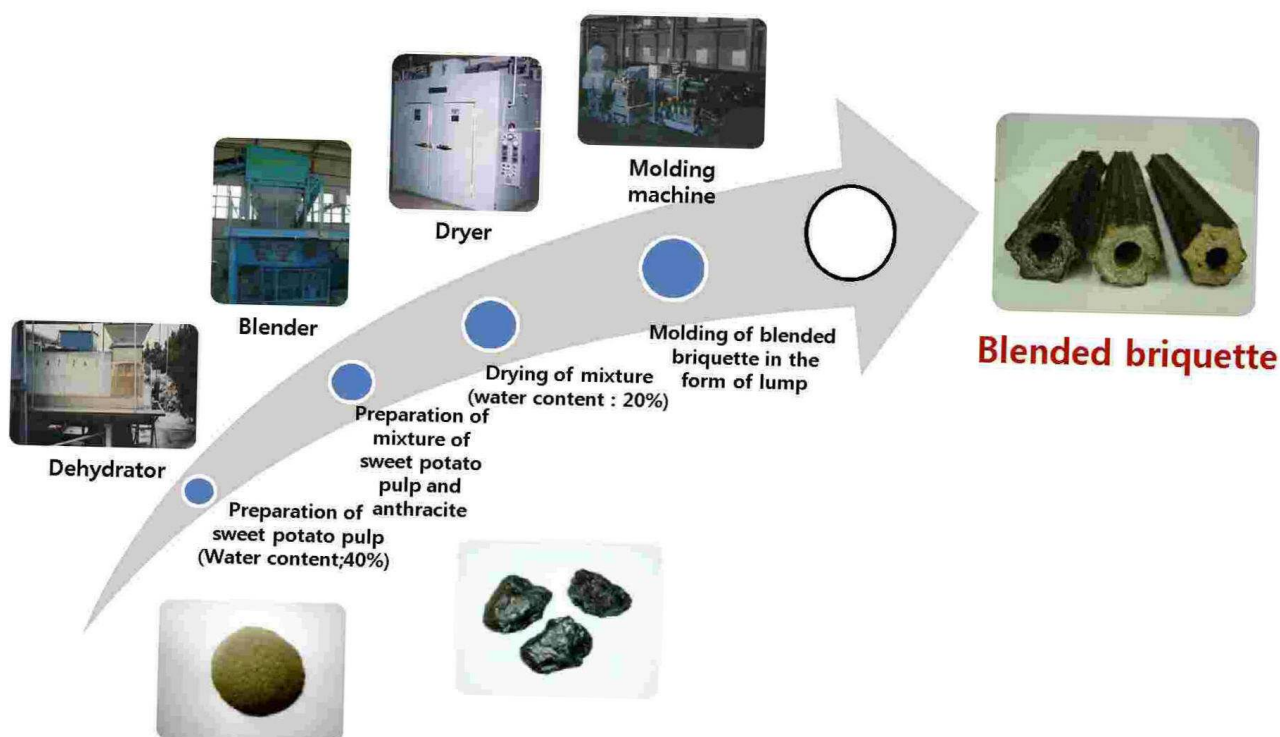


Fig. 1. Process of blended briquette

We produced briquette which is prepared by mixing sweet potato pulp and anthracite and performing compression molding using following technologies: Selection of cross-linker(plasticizer), Control to ratio of blending materials, Control of temperature and moisture content in mixtures and Encapsulation and nano-technology

Our technology provides smoke-free and mesoporous briquette with high combustion power, is able to prepare various product by changing mixing ratio and manufacture temperature and time with sweet potato pulp and anthracite and has synergic effect on heat efficiency of pure anthracite and reduces cost of preparing briquette by preparing at relatively low pressure and temperature. For the sake of cost-down(save-energy), we use the plasticizers which are to make the new structure of products with rigid or weak linkage between SPP and another materials.

■ Background and unmet needs

Anthracite coal is a principal source of metallurgical coke, and is a preferred domestic and commercial solid fuel due to its consistent size and hardness of lumps, very high carbon content, high heating value, low volatility, low ash, and especially low sulfur content. The value of anthracite as a fuel is particularly enhanced by its uncontrolled

low sulfur stack gas emission. Anthracite is the solid fuel of choice in the United States, and, more often, in the Far East, for certain space heating, cooking, stoker boiler, and metallurgical uses. Naturally-occurring clean-burning solid fuels such as wood, charcoal, and anthracite have limited availability in most parts of the world. Meanwhile, environment pollutions are world-wide concerns and there is need for new non-petroleum and low-carbon energy with low price fuels in energy industry. and there is a need of recycling of agricultural waste to clear environment.

■ Discovery and Achievements

Blended briquettes by prepared with our core technology have 5000~6000 kcal/kg, therefore are suitable for alternative fuel of coal.

Table 1. Blended briquettes prepared with sample 1, 2 or 3 have 5,000 ~ 6,000 kcal/Kg and are suitable for alternative fuel of coal.

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Anthra cite	Brown coal	Sweet potato pulp
Sweet potato pulp weight %	40	30	50	20	60			
Anthracite weight %	60	70	50	80	40			
Calorie (kcal/kg)	5,400	6,070	5,020	6,510	4,520	7,800	5,700	3,676

Patents and Publications

Table 1. List of Patents for The Present Technology

Country	Patent, Publication or Appln. No.	Status	Description
KOREA	10-0521653	Granted	Preparation of sweet potato pulp anthracite blended briquettes
KOREA	10-0353306	Granted	Preparation of biodegradable plastics with sweet potato pulp

Table 2. List of Publications for The Present Technology

No.	Journal	Title
1	Journal of Applied Polymer Science 83 (2). 423-434	Process optimization of sweet potato pulp-based biodegradable plastic using response surface methodology.