초음파와 고전압 병행 처리에 의한 슬러지 용존화 상승효과

*변 영철, 김 재훈, 신 동남, **고 동준

Synergic effect of sludge solubilization by the combined treatment of ultrasound and high voltage

*Youngchul Byun, Jaehun Kim, Dong Nam Shin, **Dong Jun Koh

0.5 ton/day 용량의 장비를 이용하여 초음파와 고전압 단독 처리에 의한 슬러지 용존화율을 조사하였다. 또한 초음파와 고전압을 병행한 방법에 의한 슬러지 용존화율을 조사하였다. 그 결과 초음파와 고전압을 개별적으로 적용하였을 시 나타나는 슬러지 용존화율 보다 이 둘을 병행하여 함께 처리했을 시에 나타나는 슬러지 용존화율에 기대 이상의 상승효과가 있는 것을 알 수 있었다.

Key words : sludge(슬러지), solubilization(용존화), ultrasound(초음파), high voltage(고전압), combination(결합), synergic effect(상승효과)

E-mail : *byc@rist.re.kr, **djkoh@rist.re.kr

댐목질계부유물을 이용한 바이오에너지 생산 가능성 연구

*조 중식, 신 수정, 조 병렬, 이 병찬, 이 준호, **연 익준

A Study of Bio-Energy Production using Suspended Wood Waste from Dam

*Jung-Sik Cho, Soo-Jeong Shin, Byung-Yeol Cho, Byung-Chan Lee, Jun-Ho Lee, **Ik-Jun Yeon

The use of renewable energy sources is becoming increasingly necessary to minimize the problems derived from the global warming impacts caused by the utilization of fossil fuels as well as their limited supply and reservoir. Also, localized heavy rain has occurred in many areas. As a result, suspended wood waste is being inflow into the dam and the problem of waste disposal has occurred. It is a unique renewable and alternative source for the production of energy.

The experiment using wood waste (dry weight 25.0g) was conducted for extraction sugars such as xylose, lactose and glucose. For the sugar extraction from wood waste, hydrolysis experiment using wood waste was conducted by two steps. First step was reacted with 72% sulfuric acid (24.0N and 37.5 ml) for 1hr at 30℃ and second step was reacted at 105 ℃ for one hour after adding 2.45times of hot water. Extracted sugar was used in the experiment of sugar consumption to estimate feasibility of ethanol production using yeast(*P. Stipitis* and *S cerevisiae*).

As a result, sugar extracted from wood waste was effective consumed by yeast(*P. Stipitis* and *S cerevisiae*). The consumption rate by yeast was S. cerevisiae was faster than that of *P. stipitis*. It can be confirmed that resource as ethanol production using wood waste was available.

Acknowledgement : This research was supported by grant from Chungbuk Regional Environmental Technology Development Center(CRETDC)

Key words : Suspended Wood Waste(목질계부유물), Hydrolysis(가수분해), Sugar Extraction(당추출), Yeast(효모균)

E-mail : *jscho@cjnu.ac.kr, **ijyn@cjnu.ac.kr