

- 研究課題名 「Environment-friendly production system for bio-ethanol from woody materials」
- 代表研究者名 Masatoshi Morita (Ehime University)
- 共同研究者名 katsuhisa Honda (Ehime University) , Ayato Kawashima (Ehime University) , Masahide Kawano (Ehime University) , Akihide Hideno (Ehime University) Noriyuki Suzuki (National Institute for Environmental Studies) , Norihisa Tatarazako (National Institute for Environmental Studies) , Noriaki Izumi (Kawasaki Heavy Industries, Ltd.)
- 研究協力者名 Yoshiya Izumi (Biomaterial in Tokyo Co.,Ltd)

• 要旨 (200 語以内)

Organosolvolytic of the wood powder was examined for developing an effective production of lignocellulosic ethanol. The wood powder was pretreated at various conditions and the resulting substrate was hydrolyzed by cellulase. The high saccharification yield over 40% was obtained at the pretreatment conditions of ethanol/water/acetic acid=75/25/1 at 140 °C or ethylene glycol/water/acetic acid=75/25/1 at 170 °C with subsequent ball-milling. The saccharification yield about 30% without ball-milling was also obtained by pretreatment with ethanol/water/TFA=50/50/2 or ethanol/water/hydrochloric acid=50/50/0.4 at 170 °C.

Simultaneous fermentation with enzyme saccharification was examined and yeast strain of NBRC1777 showed high ethanol production performance at 43 °C. Fermentation of xylose was also investigated with recombinant xylose-fermenting *Saccharomyces cerevisiae* and higher ethanol yield than by normal cellulase was obtained.

Lignin depolymerization and production of adsorbents from lignin residue were also investigated for assessing the possibility of effective utilization of lignin residue. The lignin residue was depolymerized in alcohol at 210-300 °C and obtained chemicals were found to be phenolic aromatic compounds. The lignin residue was also converted into activated carbon by chemical activation and obtained adsorbents indicate high adsorption activity for DL-PCB removal.

In addition, preliminary experiments were done for environmental impact assessment in relation to bio-ethanol production.

• キーワード (5 語以内)

Bio-ethanol
 Woody material
 Organo-solvolytic
 Cellulase
 Subcritical Liquid