

Pilot-scale Fermentation of *Clostridium acetobutylicum* for Production of Isopropanol-Butanol-Ethanol Fuel Mixture

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We aimed at developing an improved fuel alcohol producing *Clostridium acetobutylicum* strain. A hyper ABE producing BKM19 strain that we previously developed was further engineered to convert acetone into isopropanol. The BKM19 strain was transformed with the plasmid pIPA100 containing the *sadh* (primary/secondary alcohol dehydrogenase) and *hydG* (putative electron transfer protein) genes from the *Clostridium beijerinckii* cloned under the control of the thiolase promoter. The resulting strain produced 27.9 g/L isopropanol-butanol-ethanol (IBE) with negligible amount of acetone, from 97.8 g/L glucose in lab-scale (2 L) batch fermentation. The scalability and stability were evaluated at 200 L pilot-scale fermentation, which showed that the fuel alcohol yield could be improved to 0.37 g/g. [This work was supported by the Advanced Biomass R&D Center of Korea (2011-0028386) through the Global Frontier Research Program of the Ministry of Education, Science and Technology. Further support by GS Caltex and BioFuelChem are appreciated.]