Isopropanol-Butanol-Ethanol (IBE) Fermentation using *Clostridium acetobutylicum* and Its Derivative

이종민, 장유신, 조정희[1], 송효학[1], 이상엽*, 승도영[1]
KAIST; [1]GS칼텍스
(leesy@kaist.ac.kr*)

A primary/secondary alcohol dehydrogenase (SADH, encoded by *adhI*) from *Clostridium beijerinckii* NRRL B-593 was introduced into *C. acetobutylicum* ATCC 824 under the control of *adc* promoter. The resulting strain was able to produce isopropanol with trace amount of acetone. In order to further increase isopropanol and butanol production, a synthetic acetone operon (*act* operon) consisting of three homologous genes (*adc*, *ctfA*, and *ctfB*) was constructed using the *adc* promoter. Simultaneous expression of *act* operon and *adhI* in C. acetobutylicum ATCC 824 resulted in increased isopropanol production, and the butanol titer was comparable with wild-type in the flask culture. Further increase of total alcohol titer was achieved using *C. acetobutylicum* PJC4BK, where the butyrate kinase gene is inactivated. [This work was supported by the Advenced Biomass R&D Center (ABC) of Korea Grant funded by the Ministry of Education, Science and Technology (2010-0029799). Further supports by GS Caltex, BioFuelChem, and the World Class University Program (R32-2008-000-10142-0) through the National Research Foundation of Korea funded by the MEST are appreciated.]