Co-production of butanol and iso-propanol using engineered *Clostridium acetobutylicum*

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A primary/secondary alcohol dehydrogenase (SADH, encoded by adh1) 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. An unwanted phenotype of the strain was lower titer of butanol than wild-type strain, possibly due to additional consumption of reducing equivalents during isopropanol production. In order to 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 adh1 resulted in increased isopropanol production, and the butanol titer was comparable with wild-type. Finally, the fate of acetoin in engineered strains was investigated by gas chromatography and quantitative reverse transcription polymerase chain reaction. [This work was supported by the Ministry of Knowledge Economy grant funded by the Korea government (#10030795). Further supports by the GS-Caltex and the BioFuelChem].