

Analysis of Dissolved CO₂ Levels on Growth, Succinic Acid Production, and Enzyme Activities of *Mannheimia succiniciproducens* MBEL55E

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Mannheimia succiniciproducens MBEL55E produces succinic acid in high concentrations as a fermentation end product. The cells could not grow below 8.74 mM of dissolved CO₂, indicating that there is a threshold level of CO₂ to sustain the growth of *M. succiniciproducens*. Succinic acid yield on glucose was 1.49 and 1.52 times higher at 141 mM CO₂ than those obtained from 8.74 mM CO₂, respectively. Through the result of enzyme activities, we focus on the efficient carboxylation of phosphoenolpyruvate (PEP) to oxaloacetate, in which CO₂-fixation occurs by both PEP carboxykinase (PckA) and PEP carboxylase (Ppc), allows *M. succiniciproducens* to produce substantial amounts of succinic acid. In particular, the activity of PckA was more than 50 times higher than those of Ppc and malic enzyme (SfcA). [This work was supported by the Korea Science and Engineering Foundation (KOSEF) grant funded by the Korea government (MOST) (2005-01294). Further supports by the LG Chem Chair Professorship, IBM SUR program, Microsoft, and by the KOSEF through the Center for Ultramicrochemical Process Systems are appreciated.].