

Interaction of *Fonticella tunisiensis* HN43 with ZVI for converting Carbon monoxide to Acetate

임현성, 김창만, 송영은, 임채호¹, 김중래[†]

부산대학교; ¹UNIST

(j.kim@pusan.ac.kr[†])

C1 gas has been highlighted for biorefinery process, and it is a valuable feedstock to produce various platform chemicals. The acetate is an intermediate chemical which can be synthesized via Wood-Ljungdahl pathway, and further substrate for chain elongation into a higher VFA when sufficient reducing power provided. Hydrogen gas and reducing sugar have problem for providing reducing power for C1 gas conversion. The zero valent iron has been widely used as a reducing agent in environmental process. In this study, we examined that the externally provided reducing power from ZVI oxidation, increase acetate production from CO and further synthesis of volatile fatty acids. The carbon and electron balance provide an information for mechanism of C1 gas conversion and chain elongation. We have shown that ZVI can provide reducing power to microbial C1 gas conversion. Furthermore, HN43 is more likely to receive electrons directly from these microorganisms as it is believed to be attached to a number of non-oxidized surfaces than to an oxidized surface. These results show that HN43 requires a combined reduction force and also uses multiple paths to accept electrons.