

SCALABLE METHODS FOR RECOVERY OF CARBOXYLIC ACIDS FROM FERMENTATION BROTH

Eric M. Karp, Robin M. Cywar, Claire T. Nimlos, Davinia Salvachúa, Meridith Wang, William Michener and Gregg T. Beckham

National Bioenergy Center, National Renewable Energy Laboratory
15013 Denver West Parkway
Golden, CO, USA 80401

Eric.karp@nrel.gov

Anaerobic fermentation of biomass-derived carbohydrates is a viable, scalable technology for the production of high-carbon efficiency organic acids that provides a platform for the production of bio-derived plastics and fine chemicals. Several organic acids are produced today at high titers, yields, and productivities at the industrial scale (e.g., succinic and lactic acids). The major barrier for the cost-competitive production of organic acids, however, is the expense and complexity associated with acid recovery and purification from dilute fermentation broths. Even current, large-scale industrial fermentation processes, like that for succinic acid, employ a series of separation steps that account for 60-70% of the total production cost.¹ Thus, the economic viability of the production of organic acids via fermentation will hinge almost entirely on robust, low-cost separation techniques. In this seminar, a scalable separations approach will be presented that achieves high yields and purities for separating both succinic acid and propionic acid from fermentation broths. Results will be presented for separations from hydrolysate based fermentations, which are inherently more difficult to handle given the increased chemical complexity of biomass hydrolysate. The demonstrated success of this approach at the laboratory level scale suggests that these methods could be important tools for researchers in the area.

References

¹Y. S. Huh, Y.-S. Jun, Y. K. Hong, H. Song, S. Y. Lee and W. H. Hong, *Process Biochem.*, 2006, **41**, 1461–1465.