

Adding waste scrap iron to enhance anaerobic digestion of sew sludge and production of methane

Yaobin Zhang

Dalian University of Technology, China

Anaerobic digestion is a slow process and easily go sour, inhibiting methane production. In this study, scrap iron was applied to accelerate anaerobic digestion of organic waste. When adding scrap iron into an anaerobic digester for treating sewage sludge, the sludge reduction increased by 12%, and methane production increased by 21.3%. Chemical iron corrosion had not increased H_2 content of the biogas, but decreased H_2 content by 85%, which was due to the stimulate of the growth of H_2 -utilizing methanogens that consumed H_2 to forward the anaerobic respiration to process. Especially, rusty iron was more effective in enhancing sludge digestion. Compared with the clean scrap iron, the rusty scrap iron could further increase methane production by 29% and increase sludge reduction by 7.1%. Iron-reducing bacteria like *Geobacter* was enriched in the rusty scrap iron-added system, triggering a dissimilatory iron reduction which is capable of utilizing complex matters in the sludge as electron donor to help the sludge decomposition and anaerobic sludge digestion.

Biography

Yaobin Zhang received his Ph.D in Environmental Engineering from Dalian University of Technology 2005. Currently he is a professor the Deputy Dean of School of Environmental Science & Technology, DUT. His research interest is anaerobic digestion of wastes to energy. He has published more than 130 peer-reviewed papers in international journals, and been authorized more than 20 patents. He was selected into the Program of the New-Century Excellent Talents in China University. He received the Youth Award of Outstanding Contribution in Scientific & Technological Innovation of China Petroleum & Chemical Association (CPCA), the Youth Scientific and Technological Award of China Environmental Scientific Society, and the First Prize of Scientific & Technological Award of CPCA.

zhangyb@dlut.edu.cn

Notes: