

## Dosing Fe<sup>0</sup> powder in anaerobic acidogenesis system for accelerating the formation of VFA

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The rate of anaerobic acidogenesis is theoretically fast so than it is often operated under low HRTs in the two-stage anaerobic system. However, incomplete acidogenesis often hampers the methanogenesis because VFAs cannot be used for methanogens until they are converted into acetate, H<sub>2</sub>/CO<sub>2</sub>, et al, which is depended on acetogenesis, a step involved in acidogenesis. A novel strategy for enhancing anaerobic wastewater treatment via dosing Fe powder reactor is explored. The results showed that the hydrolysis/fermentation was accelerated by Fe dosing. As results, the acidogenic performances in COD removal (45–56%) and VFA production were less affected by shortened HRT from 6 to 2 h. However, COD removal declined to 25% and VFA production decreased to 661 mg/L in a reference reactor without Fe<sup>0</sup> dosing (A2). Besides, Fe<sup>0</sup> dosing optimized fermentation types to reduce the production of propionate, which was favorable for subsequent acetogenesis and methanogenesis. Fluorescence in situ hybridization (FISH) analysis indicated that Fe<sup>0</sup> dosing increased the abundance of acidogens, especially acetogens. The methanogenic reactor fed with the effluent of A1 had higher COD removal and treatment stability with almost no propionate detected. These results suggested that the enhancement of acidification by Fe<sup>0</sup> powder dosing was helpful to accelerate and improve anaerobic acidogenesis to create a favorable feeding condition for the subsequent treatment.

### Biography

Yaobin Zhang is a professor of Dalian University of Technology (DUT) in China. He received his doctor degree in 2005, and is now the deputy dean of School of Environmental Science and Technology, DUT. His research interests focus on: (1) Anaerobic biological treatment technology. (2) Anaerobic energy engineering. He has published 56 papers in reputed journals (SCI).

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