Effect of different sludge reduction methods on sludge reduction rates, performance of activated sludge process and urban planning

Sheng-bao Wang

School of Architecture and Civil Engineering, Harbin University of Science and Technology, Harbin 150080, China

Email: wangshengbao1974@163.com

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ABSTRACT

Effect of biological methods (aerobic digestion, anaerobic digestion, and predation by <i>Tubifex tubifex</i>), physical methods (addition of uncoupling agent), and chemical methods (addition of ozone, chlorine) on the efficiency of sludge reduction was compared, so was the effect of different sludge reduction methods on the performance of activated sludge process with respect to the content and nature of organic matters. It was concluded that the best sludge reduction technology was using uncoupling agent with sludge reduction efficiency at 60%, followed by ozone, chlorine, micro-biological, aerobic biological, and anaerobic biological, which was the worst with efficiency at 36%. All of the molecular weight (MW) distribution of supernatant in activated sludge processes was changed to some extent under different sludge reduction methods. The change of the MW distribution would play a certain impact on the biodegradable ability of the organics, thus affecting the efficiency of sludge reduction rate. Finally, the impacts of final disposal method on urban environment were analyzed, and some recommendations related to urban planning were made.

Keywords: Sludge treatment methods; Sludge reduction; Activated sludge process; Urban environment; Urban planning