Domestic wastewater treatment using biological aerated filtration system with modified zeolite as biofilm support

Yan Feng\textsuperscript{a,b}, Yanzhen Yu\textsuperscript{a*}, Liping Qiu\textsuperscript{a}, Sheng Feng\textsuperscript{c}, Jianwei Zhang\textsuperscript{d}

\textsuperscript{a}School of Civil Engineering and Architecture, University of Jinan, Jinan 250022, China
Email: cea_fengy@ujn.edu.cn
\textsuperscript{b}School of Municipal and Environmental Engineering; Harbin Institute of Technology, Harbin 150090, China
\textsuperscript{c}Jizhuang Sishui County Primary School, Jining 273200, China
\textsuperscript{d}Sishui Jianxin Engineering Municipal Construction Supervision Co., Ltd., Jining 273200, China

Received 7 May 2013; Accepted 11 September 2013

\textbf{ABSTRACT}

Modified zeolite and natural clinoptilolite were applied to treat domestic wastewater in two two-stage up-flow biological aerated filters (BAF) to compare their abilities to act as biofilm supports. The results showed that the two-stage BAF with modified zeolite brought a relative superiority to natural clinoptilolite two-stage BAF in terms of chemical oxygen demand and ammonia nitrogen removal under the conditions of temperature 20–26°C and dissolved oxygen above 4.00 mg l\textsuperscript{-1}. In addition, the detection of the amount of heterobacteria and nitrobacteria of two two-stage BAFs also showed that modified zeolite medium was more suitable to the attached growth of nitrobacteria, which is helpful to the improvement of nitrification performance in two-stage BAF with modified zeolite.

\textit{Keywords:} Modified zeolite; Biological aerated filter; Start-up; Ammonia nitrogen; CODcr

*Corresponding author.

Presented at the Conference on Water Resources and Urbanization Development, 26–27 September 2012, Tianjin, China