

Influence of the type of activated carbon on invertebrate leakage in biological activated carbon filter

Zhiling Wu, Xianchun Tang, Hongbin Chen*

State Key Laboratory of Pollution Control and Resource Reuse, College of Environmental Science and Engineering, Tongji University, Shanghai 200092, China, email: w84742914@126.com (Z. Wu), 591138308@qq.com (X. Tang), Tel. +86 21-65984569, Fax +86 21-65983602, email: bhctxc@tongji.edu.cn (H. Chen)

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ABSTRACT

The relationship between the type of activated carbon and invertebrate leakage in biological activated carbon (BAC) filters was investigated in a full-scale test. The results showed that the specific surface area and total pore volume, and the particle size of the activated carbon were the two main factors that affected the invertebrate leakage. The larger the specific surface area and total pore volume were, the larger was the number of invertebrates that grew on the activated carbon and penetrated through the carbon layers. The larger the particle size was, the easier it was for the invertebrates to penetrate through the carbon layers. The BAC filters had similar effects on the removal of organic matter, which was attributed to the similar bacterial community compositions on the activated carbon layers. The dominant bacteria genera on the three BACs were *Bacillus*, *Pseudomonas*, and *Lactococcus*, and their proportions were similar. Hence, on the premise that the carbon particles are not flushed out during backwashing, activated carbon with a smaller particle size should be preferred to that with a larger particle size. Carbon age should not be the only evaluation indicator to determine whether the activated carbon should be regenerated or replaced.

Keywords: Type of activated carbon; Invertebrates; Microbial properties; Ozone–BAC

*Corresponding author.