



## Simultaneous removal of nitrogen and phosphorus using autoclaved aerated concrete particles in biological aerated filters

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### ABSTRACT

Autoclaved aerated concrete particles (AACPs) were developed as alternative for the biofilter carriers. To obtain high biomass concentration, the biogenic stimulating properties of the AACPs were investigated. Meanwhile, the feasibility of using these particles as biological aerated filter media was assessed. The experimental results showed that the removal efficiencies of chemical oxygen demand (COD<sub>Cr</sub>) and total nitrogen (TN) both increased with the increase in the ratio of COD<sub>Cr</sub> to NH<sub>4</sub><sup>+</sup>-N (C/N) in the biofilters. It could be demonstrated that the well-developed porous structures of AACPs were conducive to many microbial communities, resulting in an improvement of the permeability of biofilm layers and the pollutant removal efficiencies. The adoption of AACPs in such an environment significantly improved phosphate removal from wastewater. Our findings suggested that AACPs can play significant roles as carriers in simultaneous nitrification and denitrification by biological wastewater treatment systems.

**Keywords:** Autoclaved aerated concrete particles; Biofilm; Simultaneous nitrification and denitrification; Phosphate removal

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