Effect of Cr(III) on process performances of MBR systems

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ABSTRACT

The paper investigates the effect of Cr(III) on the heterotrophic biomass of membrane bioreactors (MBRs) to understand the consequences on process performances. Respirometric tests are conducted to evaluate the consequences of chromium injection on oxygen consumption and oxygen uptake rate for the sludge sampled from a MBR pilot plant and, comparatively, for the sludge sampled from a conventional activated sludge treatment plant. MBR sludge is found to be more resistant to chromium injection than conventional activated sludge. Measurements of residual metal concentration are carried out to understand the mechanism of chromium adsorption and assimilation. The release of soluble microbial products, which play an important role on membrane fouling, is also investigated. Obtained information is completed by microscopic observations, aimed at identifying the variation of biomass structure and composition due to the presence of Cr(III).

Keywords: Biomass; Chromium; Inhibition; MBR; SMP

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