ABSTRACT

This study focused on evaluating the effects of flocculant addition on the performance of membrane bioreactor (MBR). Two different flocculants, aluminum sulfate (alum) and polyaluminum chloride (PACl), were tested and the performance of MBR system in terms of COD removal, membrane fouling, and sludge properties was investigated. Addition of both flocculants resulted in significant reduction of membrane fouling rate and polyaluminum chloride was found more effective than alum. The sustainable filtration time at optimum dosage of alum and PACl was, respectively, 2.5 and 4.2 times more than that in control MBR which had no flocculant. Additionally, sludge oxygen uptake rate (OUR) improved in the presence of both flocculants and average OUR values obtained from flocculant-added membrane bioreactors was about 1.5 times more than that in control MBR. The results also revealed that there were no significant difference in COD removal of flocculant-added MBRs and control MBR and the treatment in all the three MBRs led to high COD removal efficiencies.

Keywords: Flocculant; Fouling; Membrane bioreactor; Trans-membrane pressure