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Influence of fermentation liquid from waste activated sludge on anoxic/oxic- membrane bioreactor performance: Nitrogen removal, membrane fouling and microbial community

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Abstract

In order to investigate effects of waste activated sludge (WAS) fermentation liquid on anoxic/oxic- membrane bioreactor (A/O-MBR), two A/O-MBRs with and without WAS fermentation liquid addition were operated in parallel. Results show that addition of WAS fermentation liquid clearly improved denitrification efficiency without deterioration of nitrification, while severe membrane fouling occurred. WAS fermentation liquid resulted in an elevated production of proteins and humic acids in bound extracellular polymeric substance (EPS) and release of organic matter with high MW fractions in soluble microbial product (SMP) and loosely bound EPS (LB-EPS). Measurement of deposition rate and fluid structure confirmed increased fouling potential of SMP and LB-EPS. *γ-Proteobacteria* and *Ferruginibacter*, which can secrete

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