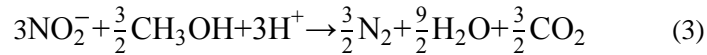
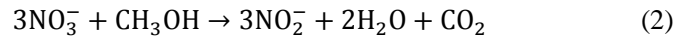
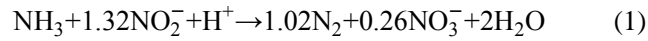


Supporting Information

At the whole periods, the TIN of 22.12 mg/L (Phase II) was removed in the anoxic period (Fig. 3(b)). Denitrification has begun in the process of feeding the sludge fermentation liquid into the SBR. The $\text{NH}_4^+\text{-N}$ brought by the sludge fermentation liquid was of 4.35 mg/L and the effluent $\text{NH}_4^+\text{-N}$ was only 0.24 mg/L. Based on Eq. (1), 4.11 mg/L $\text{NH}_4^+\text{-N}$ and 5.43 mg/L $\text{NO}_2^-\text{-N}$ were consumed by anammox reaction and 1.07 mg/L $\text{NO}_3^-\text{-N}$ was produced. In theory, 13.03 mg/L $\text{NO}_2^-\text{-N}$ and 4.84 mg/L $\text{NO}_3^-\text{-N}$ were removed by denitrification. The removal of 1 mg/L $\text{NO}_2^-\text{-N}$ and $\text{NO}_3^-\text{-N}$ through denitrification, the consumption of COD was 1.72 mg/L and 2.86 mg/L, respectively (Deng et al., 2018), respectively, while the transformation can be represented by reaction Eqs. (2) and (3). Therefore, 36.25 mg/L COD from sludge fermentation liquid was consumed by denitrification. And nitrogen removal was mainly achieved by denitrification. Heterotrophic microorganism consumed the other COD from municipal wastewater (31 mg/L) and sludge fermentation liquid (41.36 mg/L).



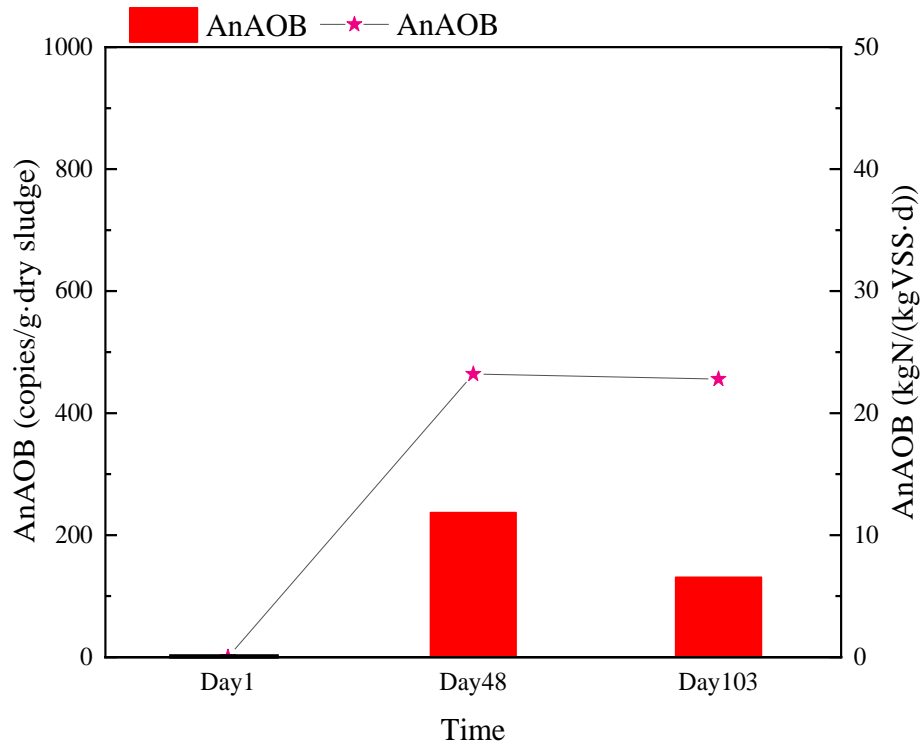


Fig. S1 Bacterial activities and abundance of AnAOB on Day 1, Day 48 and Day 103

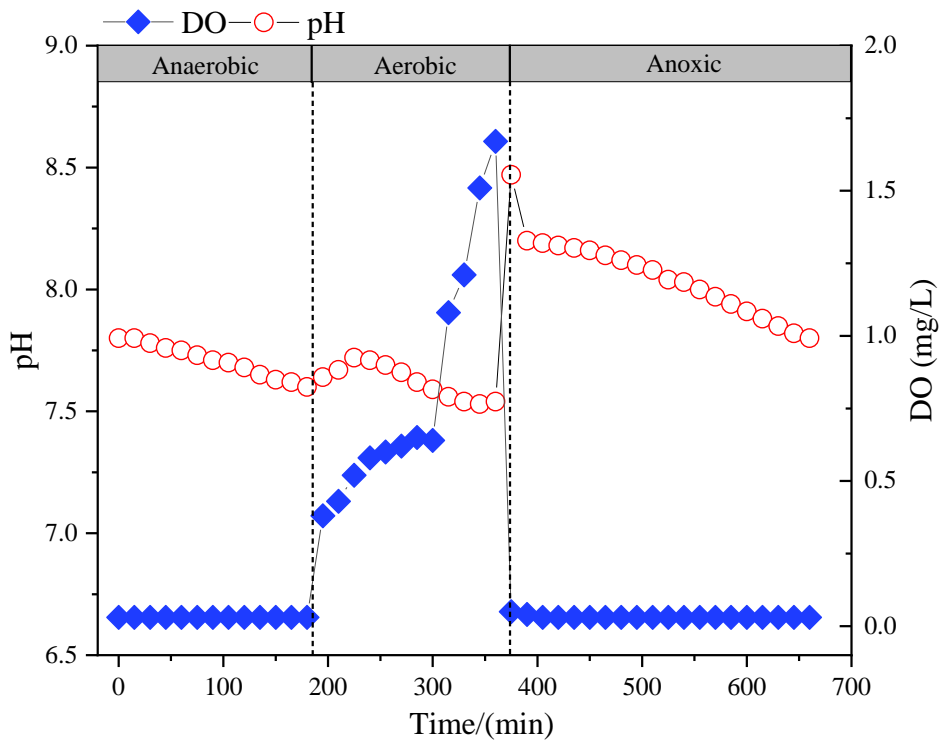


Fig. S2 Variation of pH and DO during the typical cycles

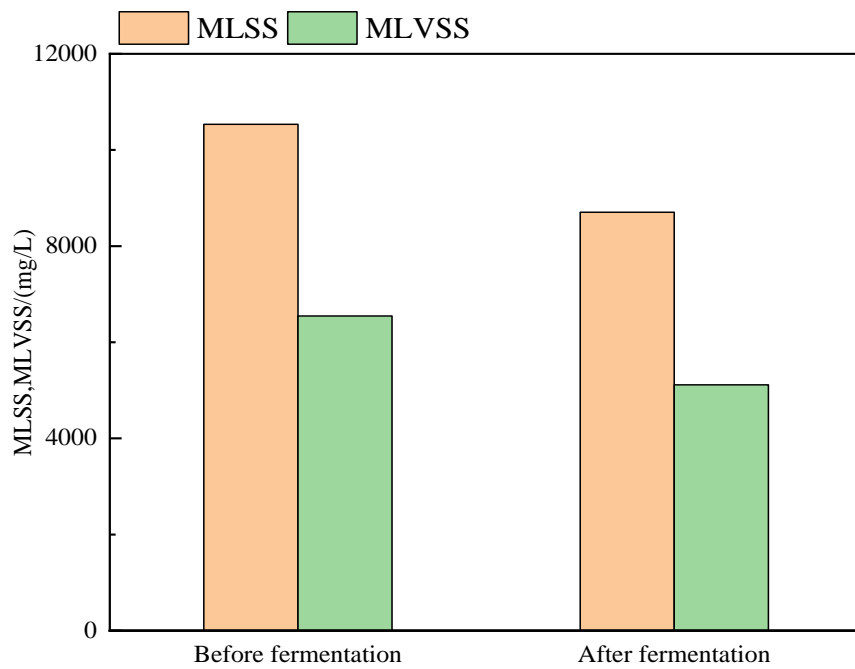


Fig. S3 The reduction of the waste activated sludge

References

Ding S, Bao P, Wang B, Zhang Q, Peng Y (2018). Long-term stable simultaneous partial nitrification, anammox and denitrification (SNAD) process treating real domestic sewage using suspended activated sludge. *Chemical Engineering Journal*, 339: 180–188