

## A b s t r a c t

T i t l e	Removal of refractory and persistent organic compounds by membrane bioreactors (MBR) on acidic condition
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### [Summary]

The operation of MBR at extremely acidic condition is possible to eliminate (adsorb) refractory and persistent organic compounds, because the performance of membrane bioreactors does not depend on the formation of microbial flocs.

The removal of refractory and persistent organic compounds such as phenol, salicylic acid, sodium benzoate and melanoidin by MBR at acidic condition (pH2~3) was investigated through a long-term continuous operation.

The removal of three chemical species of the phenols in the acidic condition by the MBR was examined for 115 days. The experimental set-up was consisted of an activated sludge reactor with the volume of 10L and microfiltration membrane with pore size of 0.45  $\mu\text{m}$ . The removal of the phenols added to the influent instead of glucose was investigated. COD<sub>Cr</sub>, pressure difference in the membrane process, mixed liquor suspended solids (MLSS) and microbial community were measured. The higher removal efficiency of salicylic acid in the acidic MBR was observed compared with that in the neutral-pH reactor, while the removal of phenol and sodium benzoate was more than 90% in both of the reactors.

The removal of melanoidin was examined for 56 days in the acidic condition and neutral-pH. The volume of the reactor was 5L. COD<sub>Cr</sub>, absorbance, pressure difference in the membrane process, MLSS, sludge volume (SV), microbial population and concentration of micoplutants were measured.

The color removal in the acidic reactor was higher than that in the neutral reactor, while the removal of COD<sub>Cr</sub> for both acidic MBR and neutral-pH MBR was approximately 50%. The microbial community of the acidic MBR contained higher ratio of fungi in the sludge.