

Supplementary data

Determination of Sustainable Critical Flux through a Long-Term Membrane Resistance Model

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Model application in a large-scale A2/O-MBR municipal wastewater treatment plant b1 and b2 determination

(1) *R* simulation regardless of CEB

Choosing an arbitrary membrane module A for *R* simulation, regardless of CEB, the simulation and measurement value was shown in Fig. S1.

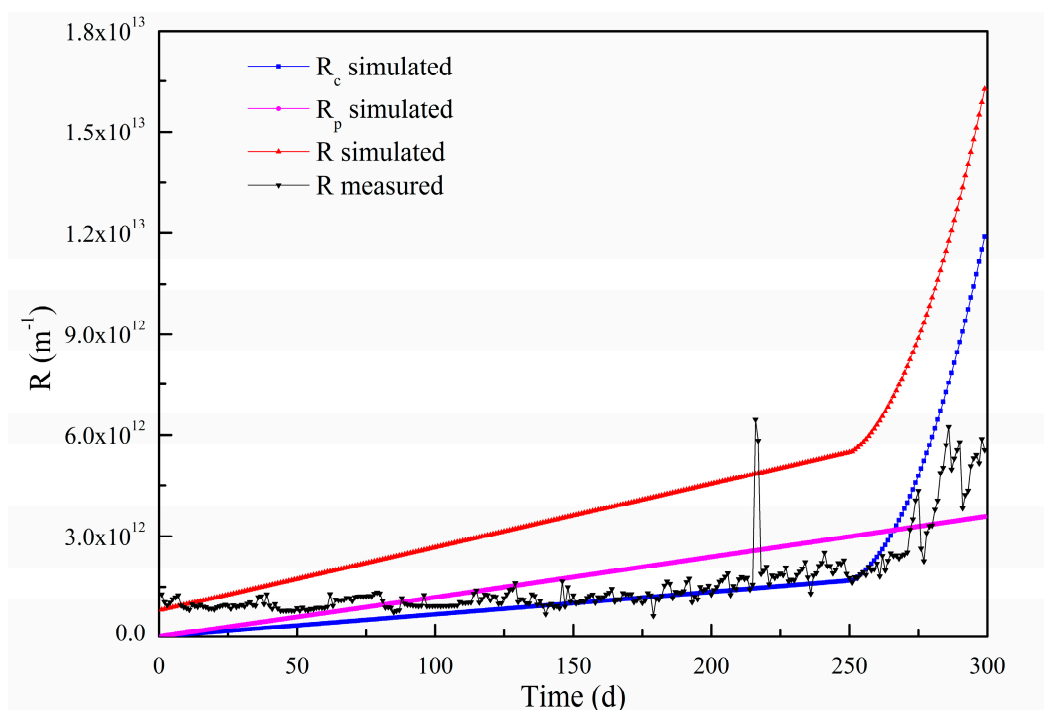


Figure S1. *R* simulation regardless of CEB.

From the Fig. S1, it was found that R -simulated was well above the R -measured. However, the R_c -simulated was consistent with R -measured, which means R_p -simulated was overestimated, and CEB had a positive effect on pore clogging remove. Therefore we considered b_1 , the parameter of R_p residue after CEB, was greater than b_2 , the parameter of R_c residue after CEB.

(2) Determination of b_1 and b_2

According to the stronger inhibition of membrane pore resistance by CEB, different coefficients of b_1 and b_2 were set as Table 1s and simulated. The simulated results were shown in Fig. S2.

Table S1. Coefficients of different simulation process.

Coefficients	1	2	3	4	5	6
b_1	0.05	0.05	0.1	0.1	0.15	0.2
b_2	0.95	0.9	0.9	0.8	0.8	0.7

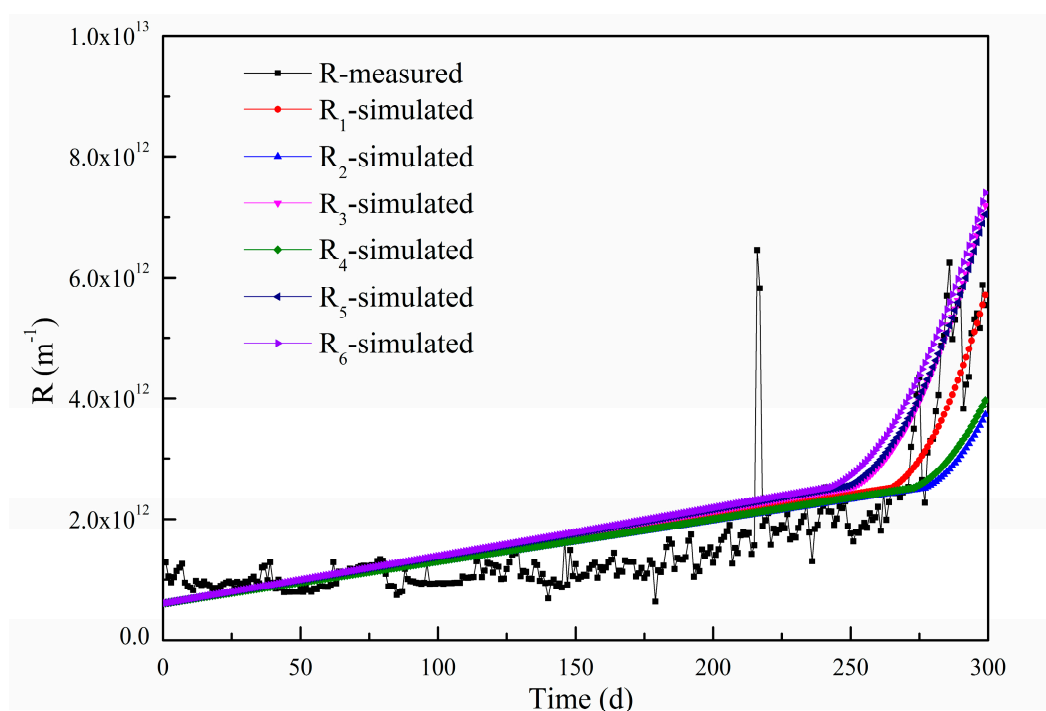


Figure S2. S R of simulation and measurement under different coefficients.

It can be found that R_1 -simulated was very consistent with R -measured from the Fig. S2. The simulation of R_3 , R_5 and R_6 were higher than R -measured, and that of R_2 , R_4 were lower. $b_1=0.05$, $b_2=0.95$ was more suitable for simulation.

(3) Calibration of b_1 and b_2

In order to verify the reliability of b_1 and b_2 , R of two other membrane modules B and C were simulated, and the results was shown in Fig. 3S.

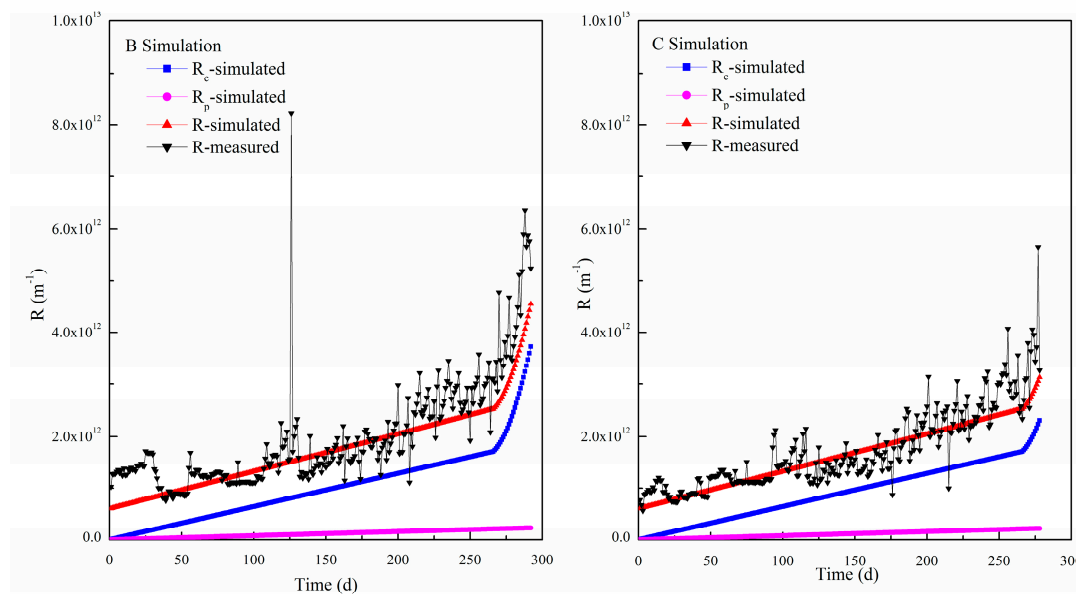


Figure S3. S R simulation and measurement of membrane module B and C.

The R-simulated of B and C were very consistent with R-measured, which means that $b_1=0.05$, $b_2=0.95$ were proper parameters for R simulation with CEB.