Environmental Science & Technology

ADDITION/CORRECTION

pubs.acs.org/est

Threshold Concentration of Easily Assimilable Organic Carbon in Feedwater for Biofouling of Spiral-Wound Membranes [*Environmental Science & Technology* **2009**, *43*, 4890]. Wim A.M. Hijnen,* David. Biraud, Emile R. Cornelissen, and Dick van der Kooij

The values calculated for first-order fouling rate constant, R_f, published in Hijnen et al. *Environ. Sci. Technol.* **2009**, *43*, 4890−4895 are incorrect because of the use of an incorrect formula. The following formula was used:

$$\mathrm{NPD}_i = \mathrm{NPD}_t - \mathrm{NPD}_o = e^{R_f t} \text{ and } \ln \frac{\mathrm{NPD}_t}{\mathrm{NPD}_o} = R_f t$$

The values for R_f were calculated with linear regression analysis of the increase of NPD_i in time, and ln NDP_i was derived from $\ln(\mathrm{NPD}_t) - \ln(\mathrm{NPD}_o)$, which is not correct. The correct formula for the calculation of ln NDP_i should use $\ln(\mathrm{NPD}_t - \mathrm{NPD}_o)$ because

$$\mathrm{NPD}_i = (\mathrm{NPD}_t - \mathrm{NPD}_o) = e^{R_f t} \text{ and } \ln(\mathrm{NPD}_t - \mathrm{NPD}_o) = R_f t$$

The corrected R_f values are presented in Table 1. The relationship between the acetate concentration and the corrected R_f is

Table 1. Recalculated Exponential Fouling Rate Constant R_f Values

S_{ac} (μg C·L^{-1}) (temp °C)	MFS I; R_f (ln NPD$_i$.d^{-1}; 95% CI; r^2)	MFS II; R_f (ln NPD$_i$.d^{-1}; 95% CI; r^2)
1000 (13.5 ± 0.3)	1.475 (1.421−1.528; 0.99)	1.126 (1.057−1/194; 0.99)
500 (13.5 ± 0.3)	0.859 (0.756−0.962; 0.99)	1.144 (1.041−1.247; 0.99)
1000 (14.3 ± 0.4)	1.097 (0.954−1.240; 0.99)	1.116 (1.007−1.312; 0.99)
100 (15.2 ± 0.5)	1.123 (0.917−1.330; 0.96)	
10 (16.0 ± 0.9)	0.205 (0.197−0.214; 0.99)	0.224 (0.206−0.242; 0.96)
5 (16.1 ± 0.9−19.4 ± 2.0)[a]	0.128 (0.116−0.140; 0.95)	0.245 (0.221−0.269; 0.93)
25 (16.8 ± 0.5)	0.696 (0.597−0.795; 0.96)	0.766 (0.697−0.835; 0.98)
3 (14.9 ± 0.6)	0.102 (0.094 − 0.110; 0.94)	0.109 (0.099−0.119; 0.93)
1 (15.5 ± 0.8)	0.063 (0.055 − 0.071; 0.82)	0.027 (0.024−0.031; 0.89)

[a] Temperature during test MFS I and II, respectively.

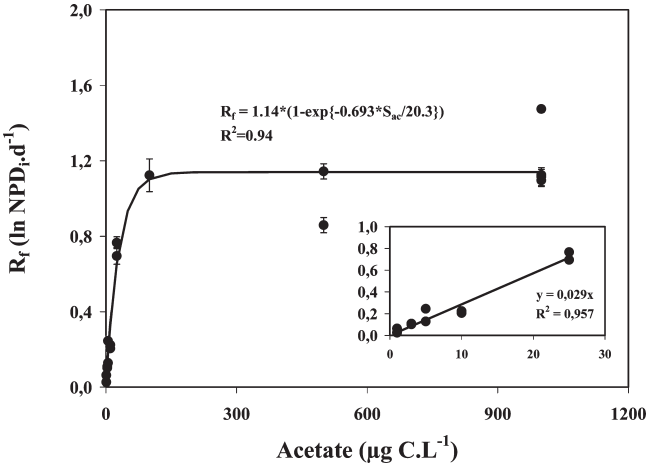

Figure 1. Relationship between the concentration of acetate in the feedwater and the fouling rate constant R_f (error bar = SD).

recalculated (Figure 1). This calculation gives a higher maximum R_f value of 1.14 d^{-1}, and the half saturation constant k_f calculated from the new data is 20.3 $\mu g\ C \cdot L^{-1}$, which is also higher than the value of 15 $\mu g\ C \cdot L^{-1}$ presented in the original publication. The major conclusion of the study that the threshold concentration for biofouling of the feed channel is about 1 μg acetate $C \cdot L^{-1}$ remains unaffected by these corrections.

DOI: 10.1021/es104170p
Published on Web 01/06/2011