Comparison and Improvement of SBR Dynamic Method

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Abstract. SBR method is the short for intermittent sequencing batch treatment that is an ideal technology to order a certain amount of intermittent operation of the activated sludge treatment process. SBR which is currently an in-depth study of the biological wastewater treatment technology is a simple process, the effect of stability, small footprint, and strong resistance to shock load and has good advantages of nitrogen and phosphorus removal capacity. This study first analyzes and discusses substrate degradation process of SBR method, compares among several different SBR methods, and then derives microbial growth and substrate degradation kinetics relationship with a view to promoting the progress of the work in this area.

Keywords: SBR method; dynamics; mathematical model
1.2 SBR

1.2.1 SBR

1.2.2 SBR

1.2.3 SBR

\[ \frac{dS}{dt} = \frac{q_X S}{K_s + S} \]

式中

\[ q_X = \frac{1}{t} \ln \frac{S^0}{S} + \frac{1}{t K_s} (S^0 - S) \]

\[ \frac{1}{t} \ln \frac{S^0}{S} = c \quad \frac{1}{t} \ln (1 + ad) = b \]

\[ a = \frac{Y}{X} \]

\[ d = S^0 - S \]

\[ Y = Y^0 e^{\frac{x}{b}} \]

\[ q = \frac{1 + b \theta}{Y^0} \]

\[ Y_s = Y \left( 1 + \frac{b}{q} \right) \]

\[ X = X^0 + Y (S^0 - S) \]

\[ \frac{1}{t} \ln \frac{S^0}{S} = c \left[ \frac{1}{t} \ln (1 + ad) \right] = b \]
2.1  

\[ S = \frac{X}{Y} + \frac{X}{Y} = \frac{X}{Y} \]  

式 (10), (11)  

\[ \hat{S} = \hat{X} + \frac{X}{Y} \]  

式 (12)  

\[ \frac{X}{Y} = \frac{X}{Y} + \frac{X}{Y} \]  

式 (8)  

余 \[ Y, b \] 。  

2.2  

SBR  

<table>
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<th>COD</th>
<th>0</th>
<th>0.5</th>
<th>1.0</th>
<th>1.5</th>
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<th>2.5</th>
<th>3.0</th>
<th>3.5</th>
<th>4.0</th>
<th>5.0</th>
<th>6.0</th>
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<td>0</td>
<td>27</td>
<td>88</td>
<td>5</td>
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</tbody>
</table>

\[ T_0 = 0 \text{ h}, S_1 = 232 \text{ mg/L}, X = \]  

SBR  

5 661 mg/L; t_1 = 2.5 h, S_1 = 132 mg/L; t_2 = 4.0 h,  

S_1 = 75 mg/L; t_3 = 6 h, S_1 = 10 mg/L,  

SBR  

2.3  

<table>
<thead>
<tr>
<th>( \hat{S} )</th>
<th>( \hat{X} )</th>
<th>( \hat{Y} )</th>
<th>( \hat{b} )</th>
<th>( \hat{R}^2 )</th>
</tr>
</thead>
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<td>5.00</td>
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<td>963.298</td>
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<tr>
<td>0.820</td>
<td>267</td>
<td>0.581</td>
<td>76</td>
<td>0.581</td>
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</tbody>
</table>

\[ Y = 0.581763, \hat{Y} = 0.581763 \]  

\[ \hat{Y} = 0.581763 \]  

3  

SBR  

1)  

SBR  

2)  

SBR  

3)
便求出所需的动力学系数或参数。

同时，大大提高了系统模拟的准确性。

综上所述，SCV 动力学模型的改进式克服了经典 SCV 动力学反应器的设计和积分反应器动力学的设计的缺点，使间歇反应器中微生物的生长和有机质降解的动态变化规律更加易于操作。

对同类型间歇反应器工艺参数的设计及其运行具有直接指导意义和参考价值。

参考文献：