

漆酶对活性艳蓝染料废水脱色

Decolorization of wastewater containing Reactive Brilliant Blue dyes by laccase

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中文摘要:

用白腐真菌漆酶对活性艳蓝X-BR和活性艳蓝K-NR 2种活性染料进行脱色实验。研究了pH、温度、染料浓度和酶活力对脱色率的影响。结果表明,漆酶脱色的适宜条件为:反应温度45℃, pH 6-7, 适宜染料浓度为50 mg/L, 酶浓度5 U/mL, 反应1 h两种染料脱色率可达到75%;通过正交实验确定2种染料的最佳脱色组合分别为:反应温度55℃、pH 7、活性艳蓝X-BR浓度50 mg/L、酶浓度5 U/mL和反应温度55℃、pH 6、活性艳蓝K-NR浓度50 mg/L、酶浓度5 U/mL。在所得最优条件下反应1 h, 活性艳蓝X-BR和活性艳蓝K-NR 的脱色率分别为74.2%和78.6%;反应2 h, 脱色率分别为78%和79.5%。

英文摘要:

The degradation of the Reactive Brilliant Blue X-BR and Reactive Brilliant Blue K-NR dye with laccase secreted by white rot fung was studied. The influences of temperature, pH value, dye concentration and activation of laccase for decolorization were tested. Results showed that the optimal temperature of the laccase was 45℃ and pH value was 6-7. Under the optimal decolorizing conditions, the decolorization of 50 mg/L Reactive Brilliant Blue X-BR and K-NR after catalyzation for 1 h with 5 U/mL of laccase added can be 75%. By taking the orthogonal test, the best decolorizing combination for Reactive Brilliant Blue X-BR was reaction temperature=55℃, pH=7, Reactive Brilliant Blue X-BR=50 mg/L, laccase concentration=5 U/mL and reaction temperature=55℃, pH=7, Reactive Brilliant Blue K-NR=50 mg/L, laccase concentration=5 U/mL for Reactive Brilliant Blue K-NR. Under the optimal conditions, the decolorization rate of Reactive Brilliant Blue X-BR and K-NR were 74.2% and 78.6% respectively after catalyzation for 1 h with laccase. Moreover, the decolorization rate can be up to 78% and 79.5%, respectively after catalyzation for 2 h.

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