

Application of Bioremediation for Treating Dye Containing Wastewater

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Synthetic dyes are extensively used in textile processing industries. About 20% of dye stuff which is used in these textile industries end up as wastewaters during dyeing and subsequent washing steps of textiles. Although there are established methods for treating said wastewaters such as chemical oxidation, ozone oxidation, activated carbon adsorption, those are not cost effective and sustainable. Use of Bioremediation by propagating the microorganisms in wastewaters is new trend for treatment of dye containing wastewaters. The objective of this research was to investigate the treatability of dye wastewater containing mixture of dyes: Telonrhodamine, Renozol yellow, Renozol navy, Novalaron blue and Methylene blue by using *microbes in yoghurt, Cow dung and hospital wastewater*. By applying said microbes in to dye wastewater samples with equal concentrations prepared as above mentioned, the variation of COD value, color of dye mixture and pH value were measured during 10 days. UV spectrophotometer (0-1500 mg L⁻¹) was used for measurement of color and COD. According to the tested results a reduction of COD and the color was observed after 10 days by 57.6%, 21.6% and 34.6% and by 78.6%, 52.9% and 63.5% in wastewaters contain *microbes in yogurt, Cow dung and hospital wastewater* respectively. The pH value didn't show any significant variation. Accordingly, to have efficient treatment of dye wastewater the microbes in yogurt was selected for further studies of treatment process optimization. Bacteria were grown with the use of 5mg of yoghurt and 50 ml of pure water in conical flask. Treatment was done at four different temperatures: 30°C, 35°C, 40°C and 45°C in an incubator at 100 rpm as per literature. The observed reduction of COD content and the color of dye containing wastewater after 10 days at four different temperatures 30°C, 35°C, 40°C and 45°C were 63.9%, 70.9%, 72.9% and 54.9% and 82.4%, 85.1%, 86.5% and 74.6% respectively. Therefore, it could be decided that the reduction of COD and color will increased when increasing the temperature of wastewater. The optimum temperature was 40°C. But in application if it is not possible to increase temperature at treatment facility, even reduction efficiency of said water qualities at room temperature (30°C) is favorable value to use.

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