

Catalytic wet oxidation of reactive dyes with Pt/TiO₂ catalyst

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Wet air oxidation is a very attractive and useful technique for treatment of effluent streams exhibiting high biochemical oxygen demand(BOD) and chemical oxygen demand(COD), but it has a detrimental shortcoming that it should be operated under severe conditions of high pressure(6–17MPa) and high temperature (150–350°C). The severity of the process can be improved by catalytic process. Catalytic wet oxidation is the catalytic oxidation of oxidizable compounds with air or pure oxygen in an aqueous phase.

Catalytic wet oxidation of reactive black 5 and reactive blue 19 was carried out on the 5wt% Pt/TiO₂ catalyst at 2.3 MPa. Both the reactive dyes in aqueous solution could be destroyed through the catalytic wet oxidation. In addition the nitrogen compound anchoring in the reactive dyes is believed to be converted mainly into N₂ gas rather than NO³⁻, which can become an advantage of the catalytic wet oxidation over the other wastewater treatment methods owing to the less production of nutrient compounds.