

Decolorization and Degradation of Ponceau Red P4R in Aqueous Solution by Ferrate (Vi)

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Abstract : Synthetic azo-dyes are widely used in food industry, they product intense coloration, high toxicity and mutagenicity for wastewater; Causing serious damage to aquatic biota and risk factors for humans. The treatment of these effluents remains a major challenge especially for third world countries that have not yet all possibilities to integrate the concept of sustainable development. These aqueous effluents require specific treatment to preserve natural environments. For these reasons and in order to contribute to the fight against this danger, we were interested in this study to the degradation of the dye Ponceau Red E124 'C₂₀H₁₁N₂Na₃O₁₀S₃' 'used in a food industry Casablanca-Morocco, by the super iron ferrate (VI) K₃FexMnyO₈; Synthesized in our laboratory and known for its high oxidizing and flocculants. The degradation of Ponceau red is evaluated with the objectives of chemical oxygen demand (COD), total organic carbon (TOC) and discoloration reductions. The results are very satisfying. In fact, we achieved 90% reduction of COD and 99% of discoloration. The recovered floc are subject to various techniques for spectroscopic analysis (UV-visible and IR) to identify by-products formed after the degradation. Moreover, the results will then be compared with those obtained by the application of ferrous sulfate (FeSO₄, 7H₂O) used by the food industry for the degradation of P4R. The results will be later compared with those obtained by the application of ferrous sulfate (FeSO₄, 7H₂O) used by the food industry, in the degradation of the P4R.

Keywords : COD removal, color removal, dye ponceau 4R, oxydation by ferrate (VI)

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