

PP-72 REMOVAL OF INDIGO CARMINE FROM AQUEOUS SOLUTIONS USING NATURAL AND
H₂SO₄ MODIFIED PLANE (*Platanus orientalis* L.) SAWDUST

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Dyes and their breakdown products, released into the environment as result of various industrial activities, cause many health disorders to human beings such as dysfunction of the kidney, reproductive system, liver, brain and central nervous system. On the other hand in streams, they induce toxic effects to fish and other organisms by chelating with metal ions and reduce light penetration and photosynthetic activity by interfering with transmission of sunlight into waters. Therefore the removal of dyes from water and wastewaters becomes an environmentally important application. Adsorption technique, which has low operating cost and short operation time, is a commonly applied, practical and effective treatment method [1].

In the present research, natural and H₂SO₄ modified plane (*Platanus orientalis* L.) sawdust was utilized for the first time as an effective and readily available adsorbents in removal of indigo carmine (IC) from aqueous solutions through a batch adsorption technique. The effects of initial solution pH, contact time, initial IC and adsorbent concentrations, and ionic strengths were evaluated on the removal efficiency of IC, after being characterized of adsorbents by different techniques including Boehm titration, moisture content, pH_{pzc} and FTIR techniques. The maximum IC adsorption of natural and modified plane sawdust was obtained as 58.82 and 55.55 mg g⁻¹, respectively at initial pH 2.0 with an equilibrium time of 240 min, adsorbent dosage of 5.0 g L⁻¹ and initial IC concentration range of 50-1000 mg L⁻¹. The adsorption behaviors of IC onto adsorbents were investigated in terms of kinetics and isotherm evaluation. Langmuir isotherm model was found to be suitable to describe the adsorption equilibrium while the adsorption kinetics followed by the pseudo-second order model.

In the view of the obtained results, it can be concluded that the natural and H₂SO₄ modified plane sawdust can be utilized as a low cost and effective adsorbent in removal of indigo carmine from aqueous solutions.

Keywords: Adsorption, Removal, Dye, Indigo carmine, *Platanus orientalis* L.

References

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