



Decolorization of aqueous coffee and tea infusions by chemical coagulation

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ABSTRACT

The production and consumption of coffee and tea results in the generation of huge quantities of colored wastewaters, and these are accountable for certain problems like color, BOD, toxicity, and odor when discharged into the aquatic environment. In this study, the color from the aqueous infusions of coffee and tea was removed by chemical coagulation, using coagulants like ferrous sulfate, alum, and lime, and the chemical coagulation was also used for the evaluation of both the process efficiency and process parameters, such as pH, dose of coagulant, effect of coagulant type, etc. A coagulant dosage of 1.0 g L⁻¹ was considered as appropriate, since a major amount (70–97%) of color removal was accomplished from different brands of coffee and tea infusions. Higher efficiency of decolorization was obtained from slightly acidic to neutral pH (4.0–6.0). Higher percentage of color removal was achieved from tea infusions compared with coffee infusions. Average color removal efficiencies of individual coagulants for coffee and tea infusions were compared in order to assess the overall efficiency of the coagulant toward the infusions. Ferrous sulfate is used as an effective coagulant for coffee with 74% removal of color, and lime is used for tea infusion with 88% removal of color. The color of the infusions has been reduced from brown and brownish red to relatively clear liquid to an extent that it can be released into the aquatic environment without any detrimental effect.

Keywords: Aqueous coffee infusion; Aqueous tea infusion; Chemical coagulation; Decolorization; Polyphenols

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