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WATER TREATMENT USING PHASEOLUS VULGARIS L. AS NATURAL COAGULANT

FLAVIA VIEIRA DA SILVA MEDEIROS; THAÍSA ALANA SCHEBELISKI; ANA PAULA PERON

Introduction: Coagulation and flocculation processes are the main processes in water treatment and are responsible for removing more than 90% of contaminants present in raw water. However, the most used chemical coagulating agent, aluminum sulfate, ends up generating residues that harm the environment and there is also research that links aluminum intake with neurological diseases. Organic coagulating agents that generate biodegradable waste and do not cause damage to health are becoming increasingly necessary. Studies of natural coagulants such as *Phaseolus vulgaris* L. have been widespread, in order to reduce or eliminate the amount of chemical coagulants used in water treatment plants for human supply, since chemical coagulants, such as aluminum sulfate, can be associated with neurological problems and Alzheimer's. **Objetivos:** Thus, this work aims to evaluate the best organic coagulant, obtained from seeds of *Phaseolus vulgaris* L. with the chemical coagulant of aluminum sulfate. **Methodology:** To prepare the organic coagulant, the seeds of *Phaseolus vulgaris* L. were first crushed and then defatted with ethyl alcohol and hexane in the proportion of 1:10, seeds were also used *in natura*, the three best results were combined with the chemical coagulant. For the combination with the chemical coagulant, 2, 6 and 8 mg/L of aluminum sulfate solution were used. The influence of pH was observed for the combined tests, with pH values ??between 6 and 12. **Results and Discussion:** It was observed that the best results with organic coagulant alone were obtained with 0.1 mg/L of seeds defatted with ethyl alcohol, presenting turbidity removal of 16% and color removal of 7.5%. Ballestrin et al., (2020) also presented better turbidity and color removal when applying ethyl alcohol as solvent in defatting *Moringa oleifera* seeds. In the combined assays, the best turbidity and color removals were achieved with 0.1 mg/L of seeds defatted with ethyl alcohol and 8.0 mg/L of aluminum sulfate, presenting 40% and 40.5% of turbidity and color removal, respectively. In addition, pH variation of raw water showed best results in pH 12, with 87% and 76.9% of turbidity and color removal, respectively. **Conclusion:** The assays with the powder of the defatted seeds defatted presented better results of turbidity and color removal when ethyl alcohol was used as solvent. The combination with chemical coagulant increased the efficiency when compared to the combined tests using seeds defatted alone. Moreover, the results indicate that pH directly influences the coagulation/flocculation mechanisms, with the best results being achieved at pH 12.

Palavras-chave: Organic coagulant, Phaseolus vulgaris l., Aluminum sulfate.

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