

Área: ANA

EFFICIENCY OF ACTIVATED CARBONS IN REDUCING CHEMICAL OXYGEN
DEMAND IN BREWERY EFFLUENTSJúlia M. H. Rodrigues (PG)^{1*}, Sueli P. Quinaia (PQ),¹ Aline M. Valendorff (PG),¹ Chalder Nogueira Nunes (PQ)¹
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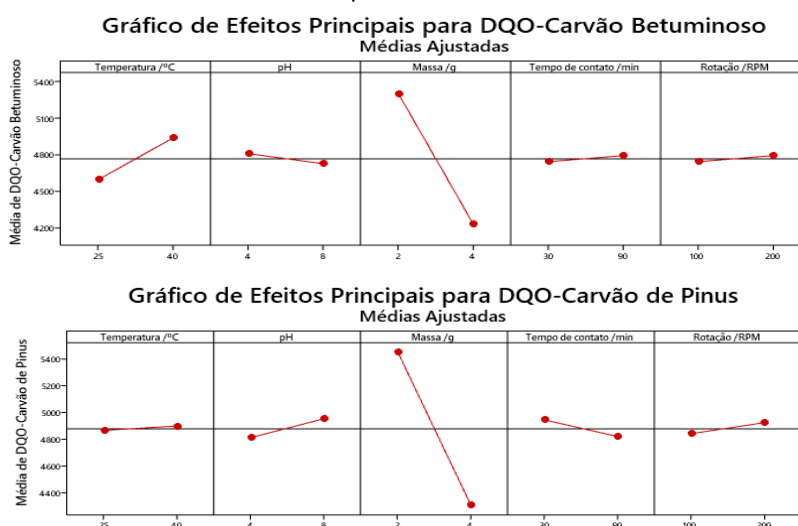
Highlights

- Beer production generates effluents with high organic load and COD, requiring proper treatment before disposal¹.
- The study evaluated activated carbons from bituminous coal and pine as low-cost adsorbents.
- A fractional factorial design was applied to optimize adsorption conditions.
- Adsorbent dosage was identified as the most significant variable affecting COD removal.
- Both activated carbons showed high efficiency, demonstrating potential for brewery wastewater treatment.

Resumo/Abstract

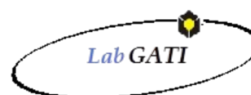
Beer production, of great economic and cultural importance in Brazil, generates effluents with high organic load and high Chemical Oxygen Demand (COD), whose improper disposal can cause serious environmental impacts². This study evaluated the efficiency of adsorption on activated carbon- bituminous (BC) and pine (CP) – reducing COD in effluents from a local microbrewery. The samples presented an initial COD of 7860 mg O₂ L⁻¹. The process was optimized using 2⁵⁻², considering variables such as adsorbent dosage (g), pH, contact time (min), agitation (RPM), and temperature (C°). It can be seen in the graphs (Fig 1), which relate to the mass of the coal, that a slope toward the higher level indicates that a greater amount of adsorbent results in an improvement in adsorption efficiency. The results, evaluated at 95% confidence interval, indicated that the amount of adsorbent was the main influencing factor. After treatment, the COD values were reduced to 3787 mg O₂ L⁻¹ (CB) and 3953 mg O₂ L⁻¹(CP), corresponding to decrease of 51,82% and 49,71%, respectively, compared to the initial value. Thus, both coals proved to be efficient and viable alternative for treatment of brewery effluent.

Figure 1: Pareto charts (95% confidence level) for the standardized effects of the factorial design applied in the optimization of COD adsorption with CB and CP.



Fonte: a autora, 2024.

Agradecimentos/Acknowledgments



[1] De Souza, S. R., & Amaral, M. C. S. (2018). *Caracterização de efluentes da indústria cervejeira e alternativas de tratamento*. Engenharia Sanitária e Ambiental, 23(5), 915-922.

[2] APHA, AWWA, WEF. (2017). *Standard Methods for the Examination of Water and Wastewater* (23rd ed.). American Public Health Association.