VALORIZATION OF BREWERY SPENT YEAST FOR THE SYNTHESIS OF BIOCOMPOSITE MATERIALS WITH APPLICATIONS IN WATER TREATMENT

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Brewing is one of the industry sector with great economic importance, according to Conway (2019) [1], who said that in 2018, worldwide beer output topped 1.94 billion hL. Large volumes of wastes are produced by the brewing industry, whose handling is both economically challenging and ecologically problematic since they build up in the environment. Residual yeast is one of the three main brewery wastes for which research into new ways of exploiting is encouraged. A literature overview [2] reveals that brewery spent yeast could be utilized in the production of nutritional supplements, functional food ingredients and other value-added products. However, *Saccharomyces pastorianus* residual biomass has not been explored for obtaining biocomposite materials and particularly not in biosorbent synthesis.

The objectives of this study were to obtain biosorbents based on *Saccharomyces pastorianus* residual biomass and natural polymers by immobilization technique and to carry out an evaluation of biosorptive capabilities for pharmaceuticals removal from aqueous matrices. Two types of biosorbents called SPRBDA 5% and SPRBA 5% were synthetized using *Saccharomyces pastorianus* residual biomass in dry and wet forms and sodium alginate. The resulted beads were characterized by scanning electron microscopy, and Fourier-transform infrared spectroscopy. Beads size and point of zero charge were also determined. In a batch system, laboratory-scale biosorption studies were conducted. Ethacridine lactate (EL) was chosen as target molecule. Removal efficiency in the case of SPRBA 5% was found to be 87.82% compared with 54.26% for SPRBDA 5% in the same operational conditions (pH 4, biosorbent dose 2 g/L, initial EL solution concentration 40 mg/L). The recorded data show that the eco-friendly synthesized biosorbents can be successfully used for the removal of pharmaceuticals from aqueous solutions and open a new direction for brewery spent yeast valorization.

Keywords: biosorption; calcium alginate; Ethacridine lactate; Saccharomyces pastorianus residual biomass

References

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