Significance of age, temperature, and aeration of yeast cell culture for the biosorption of europium from aquatic systems

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ABSTRACT

The Eu(III) uptake from aqueous solutions by Saccharomyces cerevisiae, Kluyveromyces marxianus, and Debaryomyces Hansenii was studied as a function of the growth temperature, supply of air flow during the cultivation process, and the age of cells. Our results revealed that exponential phase cells and the optimum temperature of growth resulted in a higher metal uptake, while aeration did not have any significant effect on the uptake. These traits make the proposed biosorbents desirable for clean-up processes due to easy access and low cost, as well as low time- and low energy-consuming optimal conditions as specified in this study. The reason why younger cells grown close to the optimal temperature show higher metal removal capacity is related to qualitative and quantitative alterations of their membranes' content in fatty acids and carboxyl groups mainly.

Keywords: Biosorption; Europium; Saccharomyces cerevisiae; Kluyveromyces marxianus; Debaryomyces Hansenii; Growth conditions

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