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Leading strategies in biopharmaceuticals manufacturing

BOOK OF ABSTRACTS

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Mara Freire

Rita Teles

Enzyme purification using silica-based supported ionic liquid-like phase materials

João C. F. Nunes¹, Mafalda R. Almeida¹, Valéria C. Santos-Ebinuma², Márcia C. Neves¹,
Mara G. Freire¹, Ana P. M. Tavares¹

¹CICECO-Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal

²Department of Engineering of Bioprocesses and Biotechnology, School of Pharmaceutical Sciences, São Paulo State University (UNESP), Araraquara 14800-903, Brazil

Abstract

Enzymes are widely studied biomolecules with relevant applications in several industries. Specifically, L-asparaginase (ASNase) is an aminohydrolase enzyme widely applied as a biopharmaceutical, as an acrylamide reduction agent, and as an enzyme-based biosensor for L-asparagine quantification¹. While widely distributed in nature, e.g., plants, animals, and microorganisms, most commercial ASNase are from recombinant microorganisms, whose production can be performed through fermentation¹. However, downstream processing of ASNase accounts for up to 80% of total production cost². Thus, a novel cost-effective downstream process is of emerging concern to allow its widespread use.

This work aims the development of a cost-effective purification process for ASNase from recombinant *Bacillus subtilis* cell lysates obtained through ultrasound sonication. Silica-based supported ionic liquid-like phase materials were studied as cost-effective ASNase purification supports by a simple adsorption method. The optimization of experimental conditions, e.g., medium pH and material/cell lysate ratio was performed regarding ASNase purity. Through this approach, process costs, energy consumption, and waste produced, may be significantly reduced, leading to ASNase price decrease, thereby allowing its widespread application.

References

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- [2] Lopes, A. M. et al. Therapeutic l-asparaginase: upstream, downstream and beyond. *Crit. Rev. Biotechnol.* 37, 82–99 (2017).

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