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P294. Extraction of L-asparaginase through supported ionic liquid materials based on silica

João C. F. Nunes, Mafalda R. Almeida, Margarida Rosmaninho, Margarida C. Ribeiro, Márcia C. Neves, Mara G. Freire, Ana P. M. Tavares
CICECO - Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, Aveiro, Portugal

E-mail: *jcfn@ua.pt*

Acute lymphoblastic leukemia (ALL) accounts with approximately 5000 new cases in the United States each year. Oncaspar, the first-line biopharmaceutical used to treat ALL, is based on L- asparaginase (LA), with annual sales of approximately USD $100 million [1]. Its purification accounts for up to 80% of total production cost [2], and so, it is key to discover new LA purification strategies to decrease its current cost, in order to allow its routinely use by a widespread population.
Supported ionic liquid materials (SILs) based on silica have been previously reported in the literature for the separation of natural compounds from vegetable biomass [3]. Nevertheless, other applications have been scarcely taken into account [4]. In this work, the study of specific interactions between SILs and LA was evaluated, allowing further purification from the fermentation broth in which it is produced. Initially, commercial LA was used to understand the adsorption performance of the enzyme on SILs. Experimental conditions, such as pH, contact time and SILs/LA ratio were assessed and optimized regarding the LA yield and recovery activity. The results show the ideal conditions for LA are pH 8 and contact time with SILs of 60 min. Through the envisioned purification strategy, process costs, energy consumption, and waste produced, might be considerably decreased, which may lead to the LA cost-cut and wider application.

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