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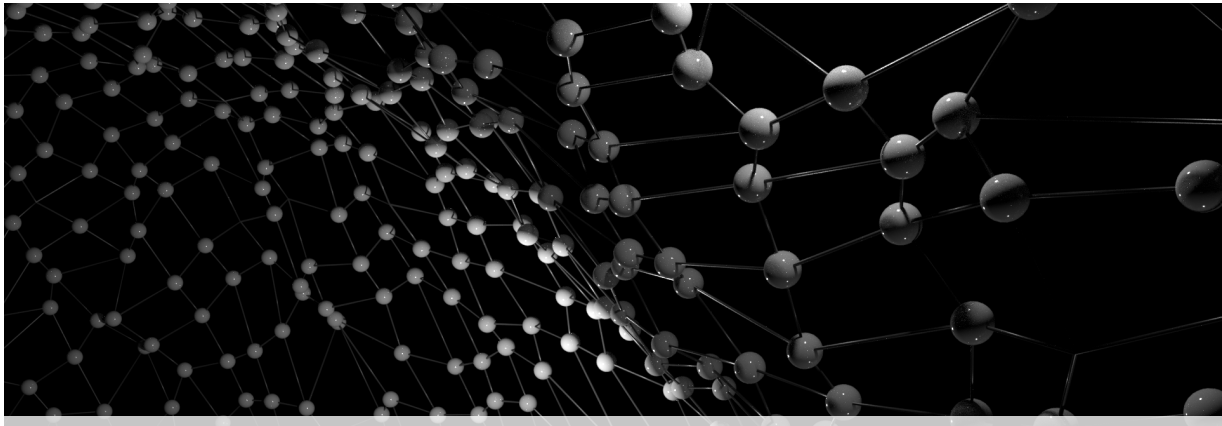

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Livro de Resumos

Supported ionic liquid materials for L-asparaginase immobilization

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L-asparaginase (ASNase) (L-asparagine amidohydrolase EC 3.5.1.1) has been widely used as a therapeutic agent in the treatment of acute lymphoblastic leukemia (ALL) and in the food industry for the removal of toxic acrylamide (formed in foods cooked at high temperatures).[1] Accordingly, ASNase is also used in biosensors for leukemia diagnosis.[1] To improve the performance of ASNase and overcome the limitations of free enzymes, namely low stability and biocatalytic activity, enzyme immobilization is one of the most used strategies. Several supports as carbon nanotubes, graphene and chitosan have been reported for ASNase immobilization.[1] Among them, nanomaterials, and in particular silica, have emerged as a promising alternative support for enzyme immobilization due to their unique characteristics, such as biological compatibility and high surface to volume ratio,[2] being thus identified as promising supports for ASNase. In this work, supported ionic liquid materials (SILs) based on silica were used as novel immobilization supports for ASNase by a simple adsorption method. Different experimental conditions, namely contact time, medium pH and ASNase/SILs ratio were evaluated. The performance of the immobilized enzyme was studied by measuring its activity through the monitoring of the hydrolysis of the substrate, Lasparagine.[3] Characterization of the ASNase-SILs bioconjugate was carried out to evaluate the adsorption of the ASNase onto the supports. The immobilization of ASNase onto the SILs was successfully achieved with an activity of immobilized ASNase ranging from 0.6 to 0.86 U of enzyme per mg of SILs under the optimum immobilization conditions (60 min, pH 8.0 and 0.06 mg.mL^{-1} of ASNase in 10 mg of SILs).

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