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Immobilization of DAAO on magnetic nanoparticles modified by reactive polymer for screening enzyme inhibitors with chiral ligand exchange capillary electrophoresis method

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Herein, D-amino-acid oxidase (DAAO) has been immobilized on the magnetic nanoparticles, which were modified by biocompatible reactive polymer, poly (glycidyl methacrylate) (PGMA) using atom transfer radical polymerization technique. It has been found that the enzyme immobilization process could be promoted greatly with the assistance of the catalyst lithium perchlorate. Meanwhile, a new amino acid ionic liquid (AAIL) was successfully synthesized and developed as the efficient chiral ligand in chiral ligand exchange capillary electrophoresis (CLE-CE) system for chiral separation of Dns-D,L-AAs and quantitation of the substrate methionine. Then the apparent Michaelis-Menten constants of the enzyme reactor were determined using the proposed CLE-CE method. The synthesized DAAO@PGMA@Fe₃O₄ nanoparticles exhibited excellent reusability and good stability. Moreover, the enzyme reactor was successfully applied in screening the DAAO inhibitors. The results demonstrated that the enzyme could be efficiently immobilized on the polymer-grafted magnetic nanoparticles and the obtained enzyme reactor has great potential in screening inhibitors, further offering a new insight for monitoring the relevant diseases.

Biography

Li Qi obtained her PhD degree in Analytical Chemistry at Hebei University, P. R. China. She is an Associate Professor at Institute of Chemistry, Chinese Academy of Sciences and has published 96 scientific papers in reputed journals, such as *Analytical Chemistry*, *Chemical Communications*, *Journal of Materials Chemistry*, *Biosensors & Bioelectronics*, *Chemistry-A European Journal*, *Journal of Chromatography A*, *Electrophoresis*. Her research interests are capillary/chip electrophoresis, chiral separation, enzyme kinetics, preparation of polymer monolith and its application.

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