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Analytica-2016 : Direct enantioenrichment of DL-mandelic acid by in situ immobilization of a general resolving agent on the magnetic multi wall carbon nanotube - Ghazale Daneshvar Tarigh - University of Tehran

Ghazale Daneshvar Tarigh
University of Tehran, Iran

L-threonine (L-thr) as a general chiral selector anchored on the surface of magnetic multi wall carbon nanotube (MMWCNT) was prepared using an in situ electrostatic adsorption and studied as a new magnetically chiral selector for the separation of chiral DL-mandelic acid (DL-MA) as a model sample. By varying the pH, DL-MA was adsorbed on the surface of magnetic chiral selector through hydrogen bonds. It was recognized that MMWCNT with chiral ligands on its surface simultaneously possessed both magnetic property and direct chiral recognition ability. The successful immobilization of L-thr onto the surface of MMWCNT was confirmed by infrared spectra (FT-IR), X-ray diffraction patterns (XRD) and transmission electon microscopy (TEM). The FT-IR and mass spectra of supernatant and elution solutions also confirmed the immobilization of L-thr onto the surface of MMWCNT. The analysis results of specific rotation, HPLC and ultraviolet-visible spectroscopy revealed that the L-thr-MMWCNT showed stronger complexation of (+)-enantiomer than (-)-enantiomer. The functional magnetic nanotubes were easily separated from the racemic solution using an external magnetic field which demonstrated its feasibility of recycling the adsorbent. All processes including in situ immobilization, enantioseparation (enantioenrichment) and magnetic separation were done by single process in a short time (only 10 min).

This article reports another chiral partition strategy—biphasic acknowledgment chiral extraction for the division of mandelic corrosive enantiomers. Circulation conduct of mandelic corrosive enantiomers was concentrated in the extraction framework with ,O ′-di-benzoyl-(2S,3S)-4-toluoyl-tartaric corrosive (D -(+)-DTTA) in natural stage and β-CD subsidiaries in watery stage, and the impact of the sorts and groupings of extractants and pH on extraction effectiveness was researched. Hydroxypropyl-β-cyclodextrin (HP-β-CD), hydroxyethyl-β-cyclodextrin (HE-β-CD), and methyl-β-cyclodextrin (Me-β-CD) have more grounded acknowledgment capacities for S -mandelic corrosive than those for R -mandelic corrosive, among which HP-β-CD has the most grounded capacity. D -(+)-DTTA specially perceives R -mandelic corrosive. pH and the groupings of extractants effectsly affect chiral partition capacity. A high enantioseparation productivity with a most extreme enantioselectivity of 1.527 is acquired at pH of 2.7 and the proportion of 2:1 of [D -(+)-DTTA] to [HP-β-CD]. The acquired outcomes show that the biphasic acknowledgment chiral extraction is of more grounded chiral division capacity than the monophasic acknowledgment chiral extraction. It might be extremely useful to upgrade the extraction frameworks and understand the large-scale creation of unadulterated enantiomers.

Carbon nanotubes (CNTs) have one of a kind mechanical, physical, electrical and absorbability properties combined with their nanometer dimensional scale that renders them amazingly important for applications in numerous fields including nanotechnology and chromatographic division. The point of this audit is to give a refreshed outline about the uses of CNTs in chiral and achiral divisions of pharmaceuticals, biologics and synthetic concoctions. Chiral single-walled carbon nanotubes (SWCNTs) and multi-walled carbon nanotubes (MWCNTs) have been straightforwardly applied for the enantioseparation of pharmaceuticals and biologicals by utilizing them as fixed or pseudostationary stages in chromatographic detachment strategies, for example, superior fluid chromatography (HPLC), narrow electrophoresis (CE) and gas chromatography (GC). Achiral MWCNTs have been utilized for achiral partitions as productive sorbent questions in strong stage extraction procedures of biochemicals and medications. Achiral SWCNTs have been applied in achiral partition of organic examples. Achiral SWCNTs and MWCNTs have been likewise effectively used to isolate achiral blends of pharmaceuticals and synthetic concoctions. On the whole, functionalized CNTs have been in a roundabout way applied in partition science by improving the enantioseparation of various chiral selectors though non-functionalized CNTs have indicated proficient abilities for chiral detachments by utilizing methods, for example, exemplification or immobilization in polymer solid segments.

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Biography:

Ghazale Daneshvar Tarigh has completed her PhD in Analytical Chemistry from University of Tehran, Iran in 2015, BSc in Pure Chemistry at the University of Zanjan in 2003 and MSc under the direction of Prof. YadollahYamini at TMU and Prof. Ali Jabbari at KNTU in 2009. Her field of interest is the development of new extraction technologies with an emphasis on miniaturized sample preparation methods and separation techniques.

Email: ghdaneshvartarigh@yahoo.com

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