

Analysis of biological active substances by high-performance liquid chromatography with coulometric detection

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	作成者: Shimada, Kazutake
	メールアドレス:
	所属:
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1988 Fiscal Year Final Research Report Summary

Analysis of biological active substances by high-performance liquid chromatography with coulometric detection

Research Project

Project/Area Number

62570959

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

Physical pharmacy

Research Institution

Kanazawa University (1988)

Tohoku University (1987)

Principal Investigator

SHIMADA Kazutake Kanazawa University, 薬学部, 教授 (90004605)

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1987 – 1988

Keywords

High-performance liquid chromatography / Coulometric detection / Electrophore / Ferrocene / Thiol / compound / Fatty acid / Optical active carboxylic acid

Research Abstract

High-performance liquid chromatography(HPLC) with electrochemical detection(ECD) is a useful method for the determination of trace components in complex matrices because of its excellent selectivity and sensitivity in previous studies, we proposed novel ferrocene reagents for the precolumn labeling of hydroxy compounds and glucuronides in HPLC-ECD. As the ferrocene derivative undergoes facile oxidation and the product is in turn readily reduced, it can be detected selectively in the presence of other electroactive compounds, such as phenols and aromatic amines. This project has dealt with the preparation and properties of derivatization reagents having ferrocene as an electrophore for the determination of fatty acids and thiol compounds by HPLC-ECD. 3-Bromoacetyl-1,1'-dimethylferrocene and N-(ferrocenyl)maleimide were most favorable reagents for

derivatization of fatty acids and thiol compounds, respectively. According to these data N-(ferrocenyl)maleimide was applied to the determination of glutathione in human blood ant the coulometric detection has been proved to be highly selective ans sensitive for the determination of biological active substances.

New derivatization methods using chiral ferroene reagents have been also developed for the optical resolution of carboxylic acids by HPLC-ECD. The diastereomeric amide formed from R-(-)-1-ferrocenylethylamine and -arylpropionic acid enantiomers were efficiently resolved within 20 min by reversed-phase chromatography with satisfactory sensitivity.

Research Products (6 results)

AllOther

AllPublications (6 results)

- [Publications] Kazutake SHIMADA,et al: J.Chromatogr.419. 17-25 (1987)▼
- [Publications] Kazutake SHIMADA,et al: J.Liq.Chromatogr.10(10). 2177-2187 (1987)▼
- [Publications] Kazutake SHIMADA,et al: J.Liq.Chromatogr.10(14). 3161-3172 (1987)▼
- [Publications] Kazutake SHIMADA et al.: "Sensitive ferrocene reagents for derivattization of thiol compounds in high-performance liquid chromatography with dual-electrode coulometric detection" J. Chromatogr.419. 17-25 (1987)▼
- [Publications] Kazutake SHIMADA et al: "Determination of fatty acids by high-performance liquid chromatography with electrochemical detection using a ferrocene derivatization reagents" J. Liq. Chromatogr.10. 2177-2187 (1987)▼
- [Publications] Kazutake SHIMADA et al.: "Ferrocene derivatization reagents for optical resolution of carboxylic acids by high-performance liquid chromatography with electrochemical detection" J. Liq. Chromatogr.10. 3161-3172 (1987)▼

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