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Chiral analysis of theanine and catechins in characterization of green tea by cyclodextrin-modified micellar electrokinetic chromatography and high performance liquid chromatography

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Highlights

- Derivatization of D/L-Theanine using OPA/NAC was applied to yield diatereomers
- Chiral MEKC allowed enantioseparation of (±)-Catechin and derivatized D/L-Theanine
- The validated method was applied to different tea types (Green, Hojicha, Oolong)
- Non-native distomers (−)-C and D-Th showed to be useful in grading tea type
- HPLC was used to confirm the results obtained in D-Th analysis

Abstract

Monomeric catechins are important compounds in green tea accounting for potential bioactivity against a wide range of diseases. Besides catechins, L-Theanine (γ-glutamylethylamide), a characteristic amino acid in tea leaves, has become a further focus of the phytochemical research for the reported beneficial effects mainly on cognitive performance, emotional state and sleep quality. In the present study has been developed a CD-MEKC method based on sodium dodecyl sulfate (SDS) and Heptakis (2,6-di-O-methyl)-β-cyclodextrin for the separation of six major green tea catechins and enantiomers of theanine. The latter, because of the poor detectability was derivatized prior analysis by o-phthaldialdehyde in the presence of N-acetyl-L-cysteine which, under mild