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Chiral gas chromatography of 2,5-diketopiperazines following a ring-opening derivatization method for complete isomeric separation

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Highlights

- A ring-opening derivatization method was developed for *cis*-DKP isomeric separation.
- The method was the esterification combined by acylation.
- Enantiomers of cyclo(Ala-Ala) were changed into dipeptide derivatives by the method.
- These derivatives were completely separated by chiral gas chromatography.
- The method was also useful for cyclo(Asp-Phe) and cyclo(Met-Pro).

ABSTRACT

2,5-Diketopiperazines (DKPs) are widely recognized as chiral molecules with great potential in medicinal chemistry. Complete separation of DKP stereoisomers is very important for efficiently investigating the chemical characteristics of DKPs. The combination of esterification and acylation caused the enantiomers of cyclo(D-Ala-D-Ala) and cyclo(L-Ala-L-Ala) to ring-open and generate their dipeptide derivatives. These derivatives were completely separated by chiral gas chromatography (GC), and the determined isomer ratios were the same as the original isomer ratios.

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