

## **Improved separation of conjugated fatty acid methyl esters by silver ion-high-performance liquid chromatography.**

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Operating from one to six silver ion-high-performance liquid chromatography (Ag+-HPLC) columns in series progressively improved the resolution of the methyl esters of conjugated linoleic acid (CLA) isomeric mixtures from natural and commercial products. In natural products, the 8 trans, 10 cis-octadecadienoic (18:2) acid was resolved from the more abundant 7 trans, 9 cis-18:2, and the 10 trans, 12 cis-18:2 was separated from the major 9 cis, 11 trans-18:2 peak. In addition, both 11 trans, 13 cis-18:2 and 11 cis, 13 trans-18:2 isomers were found in natural products and were separated; the presence of the latter, 11 cis, 13 trans-18:2, was established in commercial CLA preparations. Three Ag+-HPLC columns in series appeared to be the best compromise to obtain satisfactory resolution of most CLA isomers found in natural products. A single Ag+-HPLC column in series with one of several normal-phase columns did not improve the resolution of CLA isomers as compared to that of the former alone. The 20:2 conjugated fatty acid isomers 11 cis, 13 trans-20:2 and 12 trans, 14 cis-20:2, which were synthesized by alkali isomerization from 11 cis, 14 cis-20:2, eluted in the same region of the Ag+-HPLC chromatogram just before the corresponding geometric CLA isomers. Therefore, CLA isomers will require isolation based on chain length prior to Ag+-HPLC separation. The positions of conjugated double bonds in 20:2 and 18:2 isomers were established by gas chromatography-electron ionization mass spectrometry as their 4,4-dimethyloxazoline derivatives. The double-bond geometry was determined by gas chromatography-direct deposition-Fourier transform infrared spectroscopy and by the Ag+-HPLC relative elution order.

### MeSH Terms:

- Chromatography, High Pressure Liquid/methods\*
- Esters/chemistry
- Fatty Acids/chemistry\*
- Fatty Acids/isolation & purification
- Isomerism
- Silver

### Substances:

- Esters

- Fatty Acids
- Silver

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