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## Characterization of warfarin unusual peak profiles on oligoproline chiral high performance liquid chromatography columns

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### ABSTRACT

Unusual peak profiles of warfarin were characterized on two oligoproline chiral stationary phases (CSPs). The pattern of 1st peak (S(-)) broadening and the 2nd peak (R(+)) compression was observed under mobile phase of hexane (0.1% TFA)/2-propanol (IPA) on a triproline CSP 1, and with other alcohol modifier such as ethanol, 1-propanol, 1-butanol, 2-butanol, and tert-butanol as well. Through analyzing system peak of additives, the unusual peak profile was interpreted by perturbation of TFA additive system peak. The unusual peak profile was also found in enantioseparation of coumachlor and on a covalently bonded doubly tethered diproline CSP 2. The pattern of 1st peak (S(-)) broadening and the 2nd peak (R(+)) compression can change to pattern of 1st peak compression and the 2nd peak broadening from 15 to 50 °C. Chiral separation of warfarin created nonlinear van't Hoff plots on CSP. No peak broadening/compression were observed with methyl tertiary butyl ether or ethyl acetate as the modifier. The peak shapes of the two warfarin enantiomers can thus be tuned by varying alcohol concentration and column temperature. High separation factor and resolution may be carried out to tune the peak profiles into Langmuir/anti- Langmuir band-shape composition. Using none hydrogen donor modifier may avoid interference of the TFA system peak.

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