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Increasing Chromatographic Resolution for Analytical Signals Using Derivative Enhancement Approach

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Abstract

A few decades ago, Giddings made a bleak statistical prediction stating that when using a chromatographic column with a peak capacity of n , one “has no real hope” of separating n compounds because of peak overlap. This statement holds true for today’s far more complex separations including chiral, achiral or isotopic separations. Co-eluting chiral and isotopically labeled positional isomers pose a mass spectrometric challenge as isobaric analytes. Several advanced mathematical approaches exist to resolve and extract areas from overlapping data, such as Fourier self-deconvolution, wavelets, multivariate curve resolution, and iterative curve fitting.

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