

Theoretical Analysis of Peak Asymmetry and Sharpness of Peptides by Moment Method

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The peak shape may be characterized by the respective statistical moments, the peak skewness and excess. The purpose of this work survey the effect of the third and fourth central moments from chromatographic elution curves of peptides, Angiotensin II and Bradykinin on the peak shapes. The experimental variables were the sizes of different particles (5 and 15 μm), pore sizes (100 and 300 \AA) and flow rate of mobile phase (0.5, 0.75, 1.0, 1.25, and 1.5 ml/min). In these experimental conditions, skewness, excess, and asymmetry factor were calculated. The chromatographic experiment was performed using Waters 600S solvent delivery system (Waters, Milford, MA, U.S.A.) with 2487 UV dual channel detector (Waters, Milford, MA, U.S.A.).

As pore size in a packing is smaller, skewness tends to be larger. It means that the peak shape looks like a fronting. Also the same behavior was observed in particle size. The skewness was best in the condition of the smaller particle and larger pore, e.g. 5 μm particles with 300 \AA pore size. The excess was a standard for sharpness of a peak. If it is larger, it is sharper. In the condition of small particle size and pore size, excess showed the largest value.