Hydrophilic interaction liquid chromatography (HILIC) with diode array detection for determination of phenylalanine and tyrosine in dietary supplements

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Abstract: A hydrophilic interaction liquid chromatography (HILIC) with photodiode array detection was developed for the analysis of phenylalanine and tyrosine contents in dietary supplements. The chromatographic conditions were optimized using HILIC column (3.0 mm x 150 mm x 3 µm) with detection wavelength at 210 nm. The mobile phase consisted of 50 mM ammonium formate and acetonitrile with isocratic elution at a flow rate of 0.8 mL min⁻¹. Under the optimal condition, the calibration curve of the method ranged from 2 to 500 mg L⁻¹ and 3 to 500 mg L⁻¹ with the determination coefficient (r²) of 0.9998 and 0.9995 for phenylalanine and tyrosine, respectively. Limit of detection (LOD) and limit of quantitation (LOQ) were sufficient for quantitative analysis of the analytes in dietary supplement samples. The purposed method gave satisfactory precision and accuracy with the short analysis time within 3.5 minutes. This method was successfully applied to determine phenylalanine and tyrosine content in single and multi-nutrients dietary supplements.

Keywords: Hydrophilic interaction liquid chromatography; Phenylalanine; Tyrosine