

VALIDASI METODE ANALISIS BORON PADA SAMPEL SOSIS SECARA SPEKTROFOTOMETRI FLUORESENSI DAN UV-VIS

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INTISARI

Analisis boron secara spektrofotometri fluoresensi dan UV-Vis telah dikembangkan melalui distilasi trietil borat ke dalam larutan kurkumin. Pada proses distilasi ester borat terjadi reaksi esterifikasi antara borat dan etanol. Hasil optimum didapatkan pada saat dilakukan distilasi selama 24 jam pada suhu 25°C. Analisis boron secara spektrofotometri fluoresensi dilakukan dengan eksitasi pada 522 nm dan emisi pada 593 nm. Validasi metode menggunakan kurva standar linear pada rentang 1-4,5 ppm dengan $R^2=0,9991$, sensitivitas sebesar 4695,7 a.u.ppm⁻¹, limit deteksi 0,241±0,06 ppm dan limit kuantifikasi 0,805±0,06 ppm, serta persen perolehan kembali 92,8%. Analisis boron secara spektrofotometri UV-Vis pada panjang gelombang 535 nm. Validasi metode yang digunakan yaitu kurva standar linear pada rentang 1-5 ppm dengan $R^2=0,9995$, sensitivitas sebesar 0,0902 ppm⁻¹, limit deteksi 0,002±0,001 ppm dan limit kuantifikasi 0,006±0,001 ppm, serta persen perolehan kembali 88%. Spektrofotometri fluoresensi memberikan persen perolehan kembali lebih baik daripada spektrofotometri UV-Vis.

Kata Kunci: validasi metode, analisis boron, kurkumin, spektrofotometri fluoresensi, spektrofotometri UV-Vis

VALIDATION OF BORON ANALYTICAL METHODS ON SAUSAGE SAMPLE BY FLUORESCENCE AND UV-VIS SPECTROPHOTOMETRY

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ABSTRACT

Boron analysis by fluorescence and UV-Vis spectrophotometry has been developed through distillation of triethyl borane into the curcumin solution. In the process of distillation of ester borane, an esterification reaction occurs between borate and ethanol. The optimum result was obtained after distillation for 24 hours at 25°C. Boron analysis by fluorescence spectrophotometry was done by excitation at 522 nm and emission at 593 nm. Validation method uses linear standard curve in the concentration range of 1-4.5 ppm with $R^2 = 0.9991$. The sensitivity, limit of detection, limit of quantification, and percent recovery are 4695.7 a.u.ppm⁻¹, 0.241±0.06 ppm, 0.805±0.06 ppm, and 92.8%, respectively. Meanwhile, boron analysis by UV-Vis spectrophotometry was at 535 nm wavelength. The standard curve was linear in the concentration range of 1-5 ppm ($R^2 = 0.9995$) with sensitivity 0.0902 ppm⁻¹, limit of detection 0.002±0.001 ppm, limit of quantification 0.006±0.001 ppm, and percent recovery 88%. Both methods have been applied to determine boron in food. Fluorescence spectrophotometry method gives better percent recovery than UV-VIS spectrophotometry.

Keywords: method validation, boron analysis, curcumin, spectrophotometry
fluorometry, spectrophotometry UV-Vis



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