EKSTRAKSI BORON DENGAN 2-ETIL-1,3-HEKSANADIOL DAN 2,2,4-TRIMETIL-1,3-PENTANADIOL DALAM SAMPEL MAKANAN DAN ANALISISNYA SECARA SPEKTROFOTOMETRI UV-VIS

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INTISARI

Boron dalam sampel makanan diekstraksi dengan ligan 2-etil-1,3-heksanadiol (EHD) dan 2,2,4-trimetil-1,3-pentanadiol (TMPD) menggunakan kurkumin dan dianalisis secara spektrofotometri UV-Vis. Ekstraksi dilakukan menggunakan ligan tersebut dalam kloroform. Boron diekstraksi dengan ligan tersebut untuk memperoleh nilai koefisien distribusi kedua ligan dalam sampel makanan. Penelitian ini bertujuan untuk mendapatkan metode analisis dan metode ekstraksi dalam sampel makanan dengan ligan EHD dan TMPD yang memenuhi syarat validasi metode. Optimasi dan validasi dilakukan sebelum boron dianalisis dalam sampel.

Hasil penelitian menunjukkan bahwa absorbansi kompleks boron-kurkumin mencapai keadaan optimum dalam ligan EHD dan TMPD pada panjang gelombang 551 dan 549 nm. Koefisien distribusi dengan ligan TMPD lebih besar daripada EHD. Rata-rata nilai Koefisien distribusi pada EHD dalam sampel bakso, lontong, dan tempura sebesar 5,24; 3,23; dan 3,10. Rata-rata nilai koefisien distribusi pada TMPD dalam sampel bakso, lontong, dan tempura sebesar 6,33; 5,41; dan 5,31. Kurva standar linear pada rentang konsentrasi 2,5-7,9 ppm dalam EHD dan TMPD dengan sensitivitas 0,1078 dan 0,1019 L/mg. Nilai LoD dan LoQ dalam EHD berturut-turut 0,244 dan 0,815 µg/L sedangkan dalam TMPD sebesar 0,227 dan 0,756 µg/L. Persentase perolehan kembali dalam EHD dan TMPD analisis boron sebesar 95 sampai 103 %. Konsentrasi boron yang ada pada sampel bakso, tempura dan lontong dalam ligan EHD masing-masing sebesar 0,97-1,62; 0,64-2,80 dan 0,72-2,98 mg/kg. Konsentrasi boron yang ada pada sampel bakso, tempura, dan lontong dalam ligan TMPD masing-masing sebesar 0,80-1,40; 0,38-2,32; dan 3,0-0,49 mg/kg.

Kata kunci: boron, ekstraksi, koefisien distribusi, spektrofotometri UV-Vis

EXTRACTION OF BORON WITH 2-ETHYL-1.3-HEXANEDIOL AND 2.2.4-TRIMETHYL-1.3-PENTANADIOL IN FOOD AND ITS ANALYSIS BY UV-VIS SPECTROPHOTOMETRY

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ABSTRACT

Boron in foods was extracted with ligands 2-ethyl-1,3-hexanediol (EHD), and 2,2,4-trimethyl-1,3-pentanediol (TMPD) using curcumin and analyzed by UV-Vis spectrophotometry. The boron extraction was carried out in chloroform. Boron was extracted with that ligands to get the distribution coefficient in samples of foods. The aims of this research were to get the method of analysis and extraction in foods with ligands EHD and TMPD that fulfill of validation parameter the method. Optimization and validation were performed before boron analysis in samples.

The result showed that boron-curcumin complex has maximum wavelength at 551 nm in EHD and 549 nm in TMPD. Distribution coefficient of TMPD is greater than that of EHD. The distribution coefficients with EHD in samples of meatball, tempura and rice cake were 5.24, 3.10 and 3.23. Distribution coefficients in meatball, tempura and rice cake with TMPD were 6.33, 5.31, and 5.41. The standard curve in EHD and TMPD was linear in the concentration range from 2.5-7.9 ppm with sensitivity of 0.1078 and 0.1019 L/mg. The limit of detection (LoD) and limit of quantification (LoQ) in EHD were 0.244 and 0.815 µg/L, while in TMPD 0.227 and 0.756 µg/L. Percent recovery in EHD and TMPD was in the range 95-103%. The boron concentration in meatball, tempura and rice cake with EHD were 0.97-1.62, 0.64-2.80, and 0.72-2.98 mg/kg. The range of boron concentration in meatball, tempura and rice cake with TMPD were 0.80-1.40, 0.38-2.32, and 3.0-0.49 mg/kg.

Keywords: boron, distribution coefficient, extraction, UV-Vis spectrophotometry