Analisis cemaran bromat pada sampel air minum dalam kemasan (AMDK) secara kromatografi cair kinerja tinggi dengan derivatisasi pra kolom = Determination of bromate contamination on drinking water samples by high performance liquid chromatography with pre column derivatization / Irghazi Respayondri

Irghazi Respayondri, author

Abstrak

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Bromat terbentuk ketika air yang mengandung bromida diozonisasi seperti pada proses pembuatan air minum dalam kemasan (AMDK). Bromat merupakan senyawa hasil samping anorganik yang keberadaannya dalam air minum harus diperhatikan karena sifatnya yang berpotensi karsinogen. Penelitian ini bertujuan mendapatkan metode yang sensitif, selektif, dan valid untuk analisis bromat dalam AMDK menggunakan KCKT secara derivatisasi pra kolom dengan elusi isokratik. Fase gerak yang digunakan metanol-air (65:35) dengan laju alir 1 mL/menit. Bromat yang ditambahkan bromida dengan jumlah berlebih dalam suasana asam dapat membentuk bromin. Bromin yang terbentuk segera bereaksi dengan asetanilida menjadi 4-Bromoasetanilida yang dapat terdeteksi pada panjang gelombang 250 nm. Kondisi analisis yang telah dioptimasi kemudian divalidasi mencakup akurasi, presisi, linieritas, selektivitas, batas deteksi (LOD), dan batas kuantitasi (LOQ). Metode ini tidak membutuhkan penanganan sampel yang khusus sehingga lebih cepat dan efisien dibandingkan metode derivatisasi lainnya. Batas deteksi (LOD) metode ini pada konsentrasi 2,61 ng/mL serta dapat menetapkan kadar bromat di atas konsentrasi 8,70 ng/mL.
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ABSTRACT
Bromate is formed when water containing bromide is ozonated in production of drinking water. Bromate is the most important inorganic disinfection by-product whose concentration in water should be controlled because of its carcinogenic properties. This study aimed to obtain a sensitive, selective, and valid method for analyzing bromate in drinking water that was performed by using HPLC with pre-column derivatization and isocratic elution. Mobile phase was methanol-water (65:35) with flow rate of 1 mL/minute. Bromate was mixed with excess bromide in acid medium to form bromine. Bromine, which is formed, will immediately reacts with acetanilide and was converted to 4-Bromoacetanilide that detectable at wavelength of 250 nm. Optimized analytical conditions were further validated in terms of accuracy, precision, linearity, selectivity, limit of detection (LOD), and limit of quantitation (LOQ). This method did not need a special sample treatment so that was faster and more efficient than others derivatization methods. The limit of detection (LOD) was at the level 2,61 ng/mL and was successfully applied to assay bromate at the concentration above 8,70 ng/mL., Bromate is formed when water containing bromide is ozonated in production of drinking water. Bromate is the most important inorganic disinfection by-product whose concentration in water should be controlled because of its carcinogenic properties. This study aimed to obtain a sensitive, selective, and valid method for analyzing bromate in drinking water that was performed by using HPLC with pre-column derivatization and isocratic elution. Mobile phase was methanol-water (65:35) with flow rate of 1 mL/minute. Bromate was mixed with excess bromide in acid medium to form bromine. Bromine,

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