PENENTUAN ELEMEN PERUNUT DI DALAM CUPLIKAN BESI BAJA KEMURNIAN TINGGI DENGAN METODE ANALISIS AKTIVASI NEUTRON RADIOKIMIA

Sri Wardani
Pusat Reaktor Serba Guna - Badan Tenaga Atom Nasional

ABSTRAK

PENENTUAN ELEMENPERUNUT DI DALAM CUPLIKAN BESI BAJA KEMURNIAN TINGGI DENGAN METODE ANALISIS AKTIVASI NEUTRON RADIOKIMIA. Cuplikan besi baja kemurnian tinggi dipersiapkan oleh New Japan production og high technology iron and steel Institute of Japan dan elemen perunut yang terkandung di dalam cuplikan ditentukan dengan metode Analisis Aktivasi Neutron Radiokimia (AANR) dengan menggunakan kromatografi penukar ion. Ada 13 *aliquot* berat cuplikan (50 - 100 mg) diiradiasi selama 5 jam pada fluks neutron termal (4,0 x 10^{12} n.cm^{-2}.s^{-1}). Sesudah periode peluruhan yang sesuai, cuplikan dilarutkan di dalam larutan HCl, selanjutnya dipisahkan dari mayoritas pencampuran radioaktivitas (^{59}Fe) dengan penukar ion. Resin penukar anion yang digunakan adalah Muromax - Cl x 8 100 - 200 mesh. Untuk pemisahan nuklida digunakan distribusi ratio dari data yang diperoleh dan digunakan eluat HCl dengan variasi molar HCl di dalam kolom kromatografi. Fraksi eluat dari penukar anion diukur dengan metode pencacahan konvensional dengan detektor Ge coaxial dan data dihitung dengan program komputer, sedangkan limit deteksi dari elemen-elemen perunut dihitung dengan persamaan dari harga *detection lower limit* (ppm) per luas harga pencacahan.

ABSTRACT

DETERMINATION OF TRACE ELEMENTS IN A HIGH PURITY STEEL IRON BY RADIOCHEMICAL NEUTRON ACTIVATION ANALYSIS. High purity steel iron sample were prepared by New Japan production of high technology iron and steel Institute of Japan, and the trace elements contained in the sample were determined by Radiochemical Neutron Activation Analysis (RNAA) using ion-exchange chromatography. There were 13 aliquots of sample weighing around 50 - 100 mg were irradiated for 5 hours at a thermal neutron flux of 4.0 x 10^{12} n.cm^{-2}. s^{-1}. After suitable decay period, the samples were disolved in HCl solution. They were then isolated from the main interfering radiactivity (^{59}Fe) by ion-exchange. In separating the nuclides, the distribution ratio of the data obtained were used and various molarities of HCl were employed as eluents in the column chromatograpy. Elution fractions from the anion-exchange were measured using a conventional counting method with a Coaxial Ge detector. The collected data were calculated using a computer program while the detection limits of the trace elements were determined using equation of lower limit of detection value (ppm) per square of counting value.

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