

**UJI PARAMETER FISIKA DAN KIMIA ARANG AKTIF TERIMPREGNASI  
KALIUM IODIDA ATAU NATRIUM HIDROKSIDA TERHADAP  
EFISIENSI SERAP GAS CH<sub>3</sub><sup>131</sup>I**

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**INTISARI**

Penelitian uji parameter fisika dan kimia filter arang aktif terimpregnasi KI/NaOH terhadap efisiensi serap gas CH<sub>3</sub><sup>131</sup>I telah dilakukan. Penelitian ini bertujuan mengetahui pengaruh konsentrasi impregnasi dan ukuran mesh terhadap luas permukaan dan efisiensi serap filter arang aktif serta menentukan kondisi arang aktif yang mampu memberikan efisiensi serap paling optimum. Sampel arang aktif divariasikan dengan senyawa impregnasi KI/NaOH dengan masing-masing konsentrasi 5,0%, 7,5%, dan 10,0% b/b serta ukuran mesh 8-20 dan 12-30 mesh. Hasil modifikasi arang aktif diuji efisiensi serap melalui metode adsorpsi gas radioaktif metil iodida (CH<sub>3</sub><sup>131</sup>I) pada temperatur 30 °C, kelembaban udara 50%, 70%, dan 90%, dan laju alir gas 30 L/menit sesuai dengan *American Standard for Testing and Material* (ASTM 3803-1991). Modifikasi arang aktif hasil uji adsorptivitas diukur menggunakan alat spektrometer gamma detektor NaI(Tl) untuk mendapatkan efisiensi serap.

Hasil penelitian yang diperoleh menunjukkan bahwa arang aktif A dengan ukuran partikel lebih halus yaitu 12-30 mesh memiliki efisiensi serap lebih besar dari arang aktif B dengan ukuran partikel lebih kasar/besar. Arang aktif yang paling optimum adalah arang aktif terimpregnasi KI dengan konsentrasi 5,0% yang memberikan efisiensi serap sebesar 84%. Berdasarkan uji variasi kelembaban ditemukan bahwa arang aktif dapat bekerja optimal pada kelembaban 50%.

Kata kunci : Adsorpsi, arang aktif, iodin-131, NaOH/KI.

***PHYSICAL AND CHEMICAL PARAMETER TEST OF THE ACTIVATED  
CHARCOAL IMPREGNATED WITH POTASSIUM IODIDE OR SODIUM  
HYDROXIDE ON THE EFFICIENCY OF  $\text{CH}_3^{131}\text{I}$  GAS ADSORPTION***

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**ABSTRACT**

The research on physical and chemical parameters test of the activated charcoal filter impregnated with KI/NaOH for the efficiency of  $\text{CH}_3^{131}\text{I}$  gas adsorption has been conducted. This research has two aims, [1] to determine the influence of impregnant concentration and mesh towards the surface area and adsorption efficiency of the activated charcoal filter [2] to identify the optimal conditions for the activated charcoal to achieve the highest adsorption efficiency. The activated charcoal samples were varied with KI/NaOH impregnants at concentrations of 5.0%, 7.5%, and 10.0% w/w, and mesh size 8-20 and 12-30. The modified activated charcoal's adsorption efficiency was tested using the radioactive gas adsorption method of methyl iodide-131 ( $\text{CH}_3^{131}\text{I}$ ) at a temperature of 30 °C, air humidity levels of 50%, 70%, and 90%, and a gas flow rate of 30 L/minute following the American Standard for Testing and Material (ASTM 3803-1991). The adsorptivity of the modified activated charcoal was measured using a spectrometer gamma detector NaI(Tl) to obtain the adsorption efficiency.

The results indicate that activated charcoal A with finer particle size 12-30 mesh has higher adsorption efficiency compared to activated charcoal B with coarser or larger particle size. The most optimal activated charcoal is the one impregnated with 5.0% KI concentration, which yields an adsorption efficiency of 84%. Based on humidity variation test, it is found that activated charcoal performs optimally at 50%.

Keywords: adsorption, activated charcoal, Iodine-131, NaOH/KI