INVESTIGATION OF THE INFLUENCE OF PARTICLE SIZE OF RICE HUSK ASH AS ADSORBENT FOR MERCURY IN COLUMN ADSORPTION SYSTEM

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ABSTRACT

The presence of heavy metal mercury (Hg^{2+}) in liquid waste has caused serious problems to environmental pollution. One of the most effective method to reduce the levels of heavy metals mercury (Hg^{2+}) in liquid waste is adsorption. Rice husk ash is highly potential to adsorb heavy metals in water because it is a porous material with a high silica content. Therefore, rice husk ash can be used as an adsorbent for heavy metals in liquid waste. The purpose of this study was to determine the level of mercury (Hg^{2+}) that can be adsorbed from the column adsorption process using adsorbent of rice husk ash and to determine the optimum mass of rice husk ash as an adsorbent. The research was conducted using a series of simple adsorption column tools with a circulation time of 120 minutes. While the independent variables were adsorbent particle size of 50, 100, and 200 mesh. Measurement of mercury (Hg^{2+}) levels was carried out on samples before and after treatment with Atomic Absorption Spectrophotometer (AAS). The results showed a significant decrease in Hg^{2+} levels with the optimum adsorbent particle size of 200 mesh. The value of the adsorbed Hg^{2+} ion content reached 101.670 μg/L in the adsorption process using adsorbent with 200 mesh particle size .

INVESTIGASI PENGARUH UKURAN PARTIKEL ABU SEKAM PADI SEBAGAI ADSORBEN MERKURI PADA SISTEM ADSORPSI KOLOM

Abstrak- Keberadaan logam berat merkuri (Hg^{2+}) dalam limbah cair dapat menimbulkan permasalahan yang serius bagi pencemaran lingkungan. Salah satu upaya yang dapat di lakukan untuk mengurangi kadar logam berat tersebut dengan menggunakan metode adsorpsi. Tujuan dari penelitian ini untuk mengetahui berapa kadar Hg^{2+} yang dapat terserap dari proses adsorpsi secara kontinyu menggunakan adsorben abu sekam padi, serta menentukan ukuran partikel abu sekam padi yang optimum sebagai adsorben. Penelitian ini menggunakan rangkaian alat kolom adsoprsi kontinyu sederhana dengan waktu sirkulasi selama 120 menit. Variabel bebasnya adalah ukuran partikel adsorben abu sekam padi 50, 100 dan 200 *mesh*. Kadar merkuri pada sampel ditentukan dengan analisis menggunakan *Atomic Absorption Spectrophotometer* (AAS). Hasil penelitian menunjukkan penurunan kadar Hg^{2+} yang signifikan dengan ukuran partikel adsorben optimum 200 mesh. Nilai kandungan ion Hg^{2+} yang teradsorpsi mencapai 101,670 μg/L pada proses adsorpsi menggunakan adsorben dengan ukuran partikel 200 mesh.

Kata kunci : limbah cair, merkuri, kolom adsorpsi, abu sekam padi, ukuran partikel