

KAJIAN KANDUNGAN LOGAM BERAT, PARAMETER KESUBURAN DAN ADSORPSI DESORPSI Zn PADA TANAH BEKAS TPA DI KADISOKA, SLEMAN, YOGYAKARTA

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ABSTRAK

Telah dilakukan kajian kandungan logam berat, parameter kesuburan dan adsorpsi desorpsi Zn pada tanah bekas Tempat Pembuangan Akhir (TPA) di Kadisoka, Sleman, Yogyakarta. Penelitian ini bertujuan menganalisis tanah pada bekas TPA, menganalisis kesuburan tanah dan mengkaji adsorpsi dan desorpsi logam Zn dengan asam organik berat molekul rendah yaitu asam sitrat. Karakterisasi sampel tanah menggunakan AAS, FTIR dan XRD.

Sampel tanah diambil dari 4 titik sampel. Sifat fisika-kimia sampel yang dianalisis meliputi konduktivitas, C-organik, N, kadar abu, kadar air, KTK, pH, Mg, K, Na, Ca, P₂O₅, K₂O dan logam berat dalam sampel.

Metode adsorpsi desorpsi menggunakan crosmeyer peppas. Tanah pada sampel 2 memiliki kesuburan yang tinggi dilihat dari C-organik 5,52%, kejenuhan basa 91%. Sampel tanah 1, 3 dan 4 memiliki kesuburan yang sangat rendah memiliki C-organik < 5 %, kejenuhan basa < 50 %.

Hasil analisis kandungan logam Zn pada sampel tanah 1 sebesar 984,11 mg kg⁻¹, sampel tanah 2 sebesar 1.199,35 mg kg⁻¹, sampel tanah 3 sebesar 644,45 mg kg⁻¹ dan sampel tanah 4 sebesar 156,66 mg kg⁻¹. Adsorpsi Zn pada semua sampel tanah mengikuti model isoterm Langmuir. Desorpsi Zn dari sampel tanah menggunakan asam sitrat mencapai optimum pada konsentrasi larutan 0,2 mol L⁻¹, pH 3, waktu kontak optimum 180 menit dan volume larutan asam sitrat 5 ml. Laju desorpsi Zn dari tanah bekas TPA di Kadisoka mengikuti model kinetika Krossmeyer Peppas.

Kata kunci: sifat fisika-kimia tanah, logam Zn, adsorpsi-desorpsi, asam sitrat

STUDY OF HEAVY METAL CONTENT, SOIL FERTILIZED PARAMETERS AND Zn ADSORPTION DESORPTION ON LANDFILL OF KADISOKA, SLEMAN, YOGYAKARTA

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ABSTRACT

Research on heavy metal content of Zn and soil fertilized parameters has been carried out on landfill of Kadisoka, Sleman, Yogyakarta. This study aims to analyze the soil in the former landfill, analyze soil fertility and study the Zn adsorption and its desorption with citric acid as low molecular weight organic acid. Characteristics of soil samples were determined by using AAS, FTIR and XRD.

The research samples were taken from 4 points of location. Physical-chemical properties of the sample were analyzed such as conductivity, C-organic, N, ash content, moisture content, cation exchange capacity, pH, Mg, K, Na, Ca, P₂O₅, K₂O and heavy metals present in the soil samples.

Soil in sample 2 has high fertilized seen from C-organic 5.52%, base saturation 91%. Soil samples 1, 3 and 4 have very low fertilized Organic C <5%, base saturation <50%.

The result of Zn metal analysis on four soil samples are 1,984 mg kg⁻¹, 1,199 mg kg⁻¹, 644 mg kg⁻¹ and 156 mg kg⁻¹ for soil samples 1-4 respectively. Zn adsorption on all soil samples followed the Langmuir isotherm model. Zn desorption from soil samples reached their optimum conditions at a concentration of 0.2 mol L⁻¹, pH 3, contact time of 180 minutes and with a volume of 5 ml citric acid solution. The Zn desorption rate from soil landfill of Kadisoka followed Krossmeyer Peppas of kinetic models.

Keywords: physicochemistry properties, Zn metal, adsorption-desorption, citric acid.