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TANAH KAWASAN INDUSTRI TEKSTIL DI BANTUL DIY
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INTISARI

Kajian parameter fisika-kimia, adsorpsi dan desorpsi logam Zn menggunakan asam sitrat dan asam tartarat pada tanah kawasan industri tekstil telah dilakukan. Penelitian ini bertujuan untuk menganalisis karakter fisika-kimia tanah serta kandungan logam berat di sekitar industri tekstil yang diduga tercemar limbah, kapasitas dan isoterm adsorspi tanah terhadap logam Zn, serta kinetika desorpsi logam Zn mengggunakan larutan asam sitrat dan asam tartarat.

Sampel tanah dibagi menjadi tiga titik sampel berdasar lokasi pengambilannya, yaitu titik sampel I,II dan III. Sifat fisika kimia yang dipelajari meliputi kadar air, pH, kadar abu, konduktivitas listrik, karbon organik total, kapasitas tukar kation serta konsentrasi logam berat yang terkandung. Kapasitas adsorpsi dipelajari dengan proses adsorpsi logam Zn oleh tanah dan kinetika desorpsi Zn dipelajari dengan mendesorpsi logam Zn dengan asam sitrat dan asam tartarat.

Hasil penelitian diperoleh bahwa titik sampel I memiliki konsentrasi karbon organik total tertinggi sebesar 692,27 mg g^{-1}, dan kapasitas tukar kation sebesar 42,04 $cmol^{+}$ kg^{-1} dengan konsentrasi logam sebesar 735 mg kg^{-1}. Kapasitas adsorpsi maksimum logam Zn sebesar 708,748 mg kg^{-1}. Isoterm adsorpsi ketiga sampel mengikut model isoterm Freundlich. Desorpsi optimum menggunakan asam sitrat terjadi pada konsentrasi 0,6 mol L^{-1}, pH 3 dan waktu 7 jam, sedangkan untuk asam tartarat terjadi pada konsentrasi 0,8 mol L^{-1}, pH 3 dan waktu 7 jam.

Kata kunci : asam sitrat, asam tartarat, fisika-kimia tanah, seng

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STUDY OF PHYSICO-CHEMICAL PROPERTIES, Zn ADSORPTION AND DESORPTION USING CITRIC ACID AND TARTARIC ACID IN SOIL AROUND TEXTILES INDUSTRY IN BANTUL DIY

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ABSTRACT

Study of physico-chemical properties, adsorption and desorption of Zn using citric acid and tartaric acid on the textile industrial area has been carried out. This study aims to analyze the physico-chemical character of the soil and the content of heavy metals around the textile industry which is suspected of being contaminated by waste, the adsorption isotherm and capacity of Zn, the desorption kinetics of Zn using citric acid and tartaric acid solutions.

Soil samples were divided into three sample points based on the location where they were taken, namely sample points I, II and III. The physical and chemical properties of soil were measured, included moisture content, pH, ash content, electrical conductivity, total organic carbon, cation exchange capacity and content of heavy metals contained. The adsorption capacity was studied by the adsorption of Zn on the soil. Meanwhile, the desorption kinetics of Zn was studied by desorption of Zn using both citric and tartaric acid solution.

The results showed that sample I had the highest total organic carbon content of 692.27 mg g^{-1}, and a cation exchange capacity of 42.04 $cmol^{+}$ kg^{-1} with a metal content of 735 mg kg^{-1}. The maximum adsorption capacity of Zn is 708.748 mg kg^{-1}. The adsorption isotherm of the three samples follows the Freundlich isotherm model. The optimum desorption using citric acid occurs at a concentration of 0.6 mol L^{-1}, pH 3 and a time of 7 hours, while tartaric acid occurs at a concentration of 0.8 mol L^{-1}, pH 3 and a time of 7 hours.

Keywords: citric acid, tartaric acid, physico-chemical soil, zinc