ABSTRAK

PEMANFAATAN TULANG IKAN GABUS (*Channa Striata*) SEBAGAI ADSORBEN TERHADAP PENURUNAN KADAR LOGAM Pb PADA LARUTAN ARTIFICIAL

Ledea Afriani, 2024, 35 Halaman, 7 Tabel, 11 Gambar, 4 Lampiran

Air mempunyai peran penting dalam keberlangsungan makhluk hidup. Penurunan kualitas air disebabkan adanya zat berbahaya berupa komponen organic ataupun anorganik. Tulang ikan gabus mengandung kalsium karbonat ($CaCO_3$), yang akan didekomposisikan menjadi kalsium oksida (CaO), digunakan sebagai adsorben untuk emnurunkan kadar logam timbal pada air. Penelitian ini bertujuan untuk mendapatkan adsorben CaO dengan mengidentifikasikan suhu dan waktu kalsinasi optimal sesuai dengan SNI 06-3730 Tahun 1995 dan mendapatkan efektivitas tulang ikan gabus dalam menurunkan kadar logam timbal (Pb), serta menentukan kapasitas adsorpsi dan model isotherm adsorpsi logam timbal (Pb). Pada penelitian ini abu tulang ikan gabus (*Channa Striata*) dikalsinasi pada suhu 700°C dan 800°C selama 1 jam; 1,5 jam; 2 jam; 2,5 jam; dan 3 jam, diadsorpsi dengan larutan artificial timbal 10 ppm, dengan waktu kontak 30 menit, didiamkan selama 2 jam. Kondisi optimum yang dihasilkan adsorben tulang ikan gabus berada pada suhu kalsinasi 800°C selama 1,5 jam dengan kadar air 6%, daya serap terhadap iod 1395,9 mg/g, kapasitas adsorpsi sebesar 0,49423 mg/g dan efektivitas adsorpsi penurunan kadar logam timbalnya yaitu 99,53%. Isotherm adsorpsi yang digunakan adalah isotherm Freundlich dengan R^2 sebesar 0,9744.

***Kata Kunci**: Tulang Ikan Gabus, adsorben, adsorpsi, logam timbal, isotherm Freundlich*

ABSTRACT

UTILIZATION OF SNAKEHEAD FISH (Channa Striata) BONE AS AN ADSORBENTS FOR REDUCING Pb METAL IN CONCENTRATION IN ARTIFICIAL SOLUTION

Ledea Afriani, 2024, 35 Pages, 7 Tables, 11 Pictures, 4 Attachments

Water plays a vital role in the sustainability of living organisms. The decline in water quality is caused by the presence of hazardous substances, which may include both organic and inorganic components. Snakehead fish (*Channa striata*) bones contain calcium carbonate ($CaCO_3$), which can be decomposed into calcium oxide (CaO) through a calcination process. CaO can then be utilized as an adsorbent to reduce lead (Pb) content in water. This study aims to produce CaO-based adsorbents by identifying the optimal calcination temperature and duration according to the Indonesian National Standard (SNI) 06-3730 of 1995, to evaluate the effectiveness of snakehead fish bone in reducing lead concentrations in water, and to determine the adsorption capacity and appropriate adsorption isotherm model for lead (Pb). In this study, the bone ash of snakehead fish was calcined at temperatures of 700°C and 800°C for durations of 1 hour, 1.5 hours, 2 hours, 2.5 hours, and 3 hours. The resulting adsorbent was then applied to a 10 ppm artificial lead solution with a contact time of 30 minutes and a settling time of 2 hours. The optimal condition was found at a calcination temperature of 800°C for 1.5 hours, producing an adsorbent with 6% moisture content, an iodine number of 1395.9 mg/g, an adsorption capacity of 0.49423 mg/g, and a lead removal efficiency of 99.53%. The adsorption process followed the Freundlich isotherm model, with a determination coefficient (R^2) of 0.9744.

Keywords: *Snakehead Fish Bone, Adsorbent, Adsorption, Lead (Pb), Freundlich Isotherm*