



ADSORPSI Co(II) DENGAN ABU DASAR BATUBARA TERMODIFIKASI 8-HIDROKSIKUINOLIN

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INTISARI

Pada penelitian ini telah dilakukan kajian adsorpsi Co(II) menggunakan abu dasar batubara termodifikasi 8-hidroksikuinolin. Pembuatan adsorben abu dasar termodifikasi 8-hidroksikuinolin dilakukan dengan cara menginteraksikan serbuk abu dasar batubara yang telah diaktivasi dengan HCl dan dengan larutan 8-hidroksikuinolin pada berbagai variasi waktu. Karakterisasi adsorben abu dasar termodifikasi 8-hidroksikuinolin dilakukan dengan menggunakan instrumen XRD, FTIR, dan SSA. Kajian adsorpsi dilakukan dengan menggunakan sistem *batch* dengan variasi massa adsorben, pH, waktu kontak dan konsentrasi awal Co(II). Co(II) yang tidak teradsorpsi dianalisis dengan menggunakan spektrofotometer serapan atom (SSA). Jumlah Co(II) yang teradsorpsi dihitung dengan cara mengurangkan jumlah Co(II) mula-mula dengan jumlah Co(II) yang tidak teradsorpsi.

Hasil penelitian menunjukkan bahwa adsorben abu dasar termodifikasi 8-hidroksikuinolin memiliki kemampuan adsorpsi terhadap Co(II) yang lebih besar dari pada abu dasar tak termodifikasi. Adsorpsi Co(II) oleh abu dasar batubara termodifikasi 8-hidroksikuinolin berlangsung maksimum pada pH 5, massa adsorben 0,05 gram, waktu 90 menit dan konsentrasi awal Co(II) 100 ppm. Kinetika adsorpsi Co(II) oleh adsorben abu dasar termodifikasi 8-hidroksikuinolin mengikuti orde dua semu dan model isoterm Langmuir dengan nilai kapasitas adsorpsi 12,05 mg g⁻¹ dan energi adsorpsi sebesar 27,69 kJ mol⁻¹.

Kata kunci : Co(II), adsorpsi, 8-hidroksikuinolin, abu dasar batubara



ADSORPTION OF Co(II) BY 8-HYDROXYQUINOLINE MODIFIED COAL BOTTOM ASH

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ABSTRACT

A study on adsorption of Co (II) using coal bottom ash modified with 8-hydroxyquinoline has been performed. The preparation coal bottom ash modified with 8-hydroxyquinoline was carried out by interacting the coal bottom ash powder that has been activated with HCl and with 8-hydroxyquinoline solution at various of time. The characterization of coal bottom ash modified with 8-hydroxyquinolin was performed with AAS, XDR and FTIR machines. The adsorption process was carried out using a batch system with variation of pH, adsorbent weight, time and initial Co(II) concentration. The Co(II) that was not adsorbed was analyzed by Atomic Adsorption Spectrofotometer (AAS). The amount of Co(II) adsorbed was determined by subtracting the initial amount of Co(II) with the unadsorbed one.

The results of the research indicated that adsorbent coal bottom ash modified with 8-hydroxyquinoline has higher capacity to adsorb Co(II) than that of the unmodified one. The maximum adsorption of Co(II) by coal bottom ash modified with 8-hydroxyquinoline takes place at pH 5, adsorbent mass 0.05 gram, contact time 90 minutes and initial concentration of Co(II) 100 ppm. Adsorption kinetic study showed that the adsorption of Co(II) follows the pseudo second order and Langmuir isotherm model with adsorption capacity 12.05 mg g⁻¹ and adsorption energy 27.69 kJ mol⁻¹.

Keywords: Co(II), adsorption, 8-hydroxyquinoline, coal bottom ash