

ABSTRAK

Sistem *recovery* dengan metode adsorpsi menggunakan karbon aktif telah banyak diterapkan di industri pengolahan emas. Karbon yang dapat digunakan kembali setelah proses, menjadi faktor pemilihan sistem *recovery* ini. Proses adsorpsi pada penelitian ini, dilakukan terhadap larutan hasil pelindian bijih emas Tanggamus dengan kandungan sulfur sebesar 10,771%. Sulfur dihilangkan dengan cara pemanggangan untuk mempermudah proses pelarutan emas. Setelah proses pemanggangan, kandungan sulfur menjadi 1,211% dan terbentuk senyawa hematit yang memiliki sifat kemagnetan, sehingga dilakukan proses pemisahan magnetik. Kemudian dilakukan proses pelindian selama 4 jam. Proses adsorpsi dilakukan untuk mengetahui faktor-faktor yang mempengaruhi %adsorpsi menggunakan karbon aktif selama 4 jam dengan memvariasikan ukuran karbon aktif, jumlah karbon aktif, dan kecepatan putar *bottol roller*. Hasil terbaik setiap variabel akan dijadikan dasar untuk variasi dari variabel selanjutnya. Pada ukuran karbon aktif -10+20# didapatkan % adsorpsi sebesar 93,65%. Karbon aktif sebanyak 1500 mg/L menghasilkan %adsorpsi emas sebesar 94,31%. Saat kecepatan putar *bottol roller* mencapai 150 rpm, didapatkan %adsorpsi emas sebesar 93,37%. Kinetika adsorpsi emas pada penelitian ini berlaku pseudo orde kedua dengan nilai R^2 sebesar 0,9999 dan k sebesar $15,5831 \text{ g.mg}^{-1}.\text{jam}^{-1}$, serta didapatkan bahwa laju adsorpsi untuk emas sebesar $1,53 \times 10^4 \text{ mg.g}^{-1}.\text{jam}^{-1}$.

Kata Kunci: Bijih sulfida, Pemanggangan, Tiosianat, Adsorpsi, karbon Aktif

ABSTRACT

Recovery system with adsorption method using activated carbon has been widely applied in gold processing industry. Reusable carbon after the process, becomes a factor in the selection of this recovery system. Adsorption process in this study, conducted on the pregnant thiocyanate solution from leaching of Tanggamus gold ore that it has sulfur content of 10.771%. Sulfur is removed by roasting to facilitate the process of gold dissolution. After the roasting process, sulfur becomes 1.211% and hematite compounds are formed that have magnetism properties, so that the magnetic separation process is carried out. After that leaching process conducted for 4 hours. The adsorption process is carried out to determine the factors that affect %adsorption using activated carbon for 4 hours by varying the size of activated carbon, the amount of activated carbon, and the rotary speed of the bottol roller. The best result of each variable will be the basis for variations of the next variable. At -10+20# activated carbon size obtained % adsorption of 93.65%. Activated carbon of 1500 mg/L produces %adsorption of gold by 94.31%. When the bottol roller turns at 150 rpm, gold adsorption is obtained at 93.37%. Gold adsorption kinetics in this study applied pseudo second order with a value of R^2 was 0.9999 and k was 15.5831 g.mg⁻¹.jam⁻¹, and it was obtained that the adsorption rate for gold was 1.53×10^4 mg.g⁻¹.jam⁻¹.

Keywords: Sulphide Ore, Roasting, Thiocyanate, Adsorption, Activated Carbon