

ABSTRAK

STUDI PENGARUH FRAKSI UKURAN PARTIKEL BIJIH, KONSENTRASI SIANIDA DAN JUMLAH KARBON AKTIF TERHADAP PERSEN *RECOVERY* EMAS DAN PERAK PADA PROSES *CARBON IN LEACH*

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Peningkatan persen *recovery* emas sangat ditentukan oleh parameter operasi pengolahan bijih. Untuk mendapatkan kombinasi variasi parameter yang optimal, dapat direalisasikan melalui upaya optimalisasi parameter operasi. Beberapa parameter yang umumnya divariasikan meliputi fraksi ukuran partikel bijih, konsentrasi sianida dan jumlah karbon aktif. Penelitian ini dilakukan menggunakan metode *bottle roller test* dengan fraksi ukuran partikel bijih P₇₅ 200 mesh, P₈₀ 200 mesh dan P₈₅ 200 mesh, konsentrasi sianida 500 ppm, 750 ppm dan 1000 ppm, dan jumlah karbon aktif 5 gpl, 10 gpl dan 15 gpl. Desain rancangan percobaan menggunakan desain faktorial 3³ dan replikasi sebanyak dua kali sehingga didapatkan total percobaan sebanyak 54 kali. Pelindian dilakukan selama 16 jam, kemudian dilanjutkan dengan proses adsorpsi selama 32 jam. Konsentrasi oksigen terlarut 7-8 ppm, pH 10-11 dan persen solid 40%. Analisis kadar Au dan Ag pada padatan menggunakan *fire assay*, analisis kadar Au dan Ag pada *solution* dan analisis kadar Au dan Ag pada karbon menggunakan AAS. Berdasarkan dari data yang diperoleh, diketahui fraksi ukuran partikel bijih signifikan mempengaruhi persen *recovery* Au dan Ag, konsentrasi sianida signifikan mempengaruhi persen *recovery* Ag dan jumlah karbon aktif signifikan mempengaruhi persen *recovery* Au dan Ag. Persen *recovery* Au tertinggi 99,49% yang diperoleh pada variasi fraksi ukuran partikel bijih P₈₅ 200 mesh, konsentrasi sianida 500 ppm dan jumlah karbon aktif 10 gpl. Sedangkan persen *recovery* Ag tertinggi 91,48% yang diperoleh pada variasi fraksi ukuran partikel bijih P₈₅ 200 mesh, konsentrasi sianida 750 ppm dan jumlah karbon aktif 15 gpl.

Kata kunci: *Carbon in Leach*, Fraksi Ukuran, Karbon aktif, Konsentrasi Sianida, Persen *Recovery*.

ABSTRACT

STUDY ON THE EFFECT OF ORE PARTICLE SIZE FRACTION, CYANIDE CONCENTRATION, AND ACTIVATED CARBON AMOUNT ON GOLD AND SILVER PERCENT RECOVERY IN THE CARBON-IN-LEACH PROCESS

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The increase in the percentage of gold recovery is highly dependent on the operational parameters of ore processing. Obtaining the optimal combination of parameter variations can be achieved through efforts to optimize operational parameters. Several parameters that are commonly varied include the ore particle size fraction, the cyanide concentration, and the amount of activated carbon. The research was conducted using the bottle roller test method with ore particle size fractions of P₇₅ 200 mesh, P₈₀ 200 mesh, and P₈₅ 200 mesh; cyanide concentrations of 500 ppm, 750 ppm, and 1000 ppm; and activated carbon amounts of 5 gpl, 10 gpl, and 15 gpl. The experimental design utilized a 3³ factorial design with two replications, resulting in a total of 54 experiments. Leaching was performed for 16 hours, followed by the adsorption process for 32 hours. The operating conditions were maintained at a dissolved oxygen concentration of 7-8 ppm, pH 10-11, and percent solid of 40%. Analysis of Au and Ag content in the solid residue was performed using fire assay, while analysis of Au and Ag content in the solution and carbon was conducted using AAS. Based on the data obtained, the ore particle size fraction was found to significantly affect the Au and Ag recovery percentage, the cyanide concentration significantly affected the Ag recovery percentage, and the amount of activated carbon significantly affected the Au and Ag recovery percentage. The highest Au recovery percentage of 99.49% was achieved with the combination of P₈₅ 200 mesh particle size fraction, 500 ppm cyanide concentration, and 10 gpl activated carbon amount. Meanwhile, the highest Ag recovery percentage of 91.48% was obtained with the combination of P₈₅ 200 mesh particle size fraction, 750 ppm cyanide concentration, and 15 gpl activated carbon amount.

Keywords: Carbon in Leach, Particle Size Fraction, Activated Carbon, Cyanide Concentration, Percentage Recovery.