OPTIMIZATION IN MEDIATED ELECTROCHEMICAL OXIDATION USING COBALT SULFATE AS THE MEDIATOR SYSTEM (PART 1)

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ABSTRACT

Mediated electrochemical oxidation (MEO) using $CoSO_4$ as mediator and H_2SO_4-medium for a special treatment can be used for the prevention of metallic cobalt deposit at the cathode using exchange of polarity at certain of time by design was studied at operational temperature (20 – 60^oC). The electrolysis conditions were 6 V, DC 3A and two hours time. The blank solution investigate were showed, to color change the solution turn pink to dark blue. Co^{3+} is the key of intermediate in the oxidation processes. It was found that deposited of cobalt metallic occured on cathode after 10 minutes of electrolysis process. In addition, the simple method of exchange polarity can be used as an alternative and proven effectively for preventing cobalt metallic deposit.

Keywords: Mediated Electrochemical Oxidation (MEO), Cobalt Sulphate, polarity, X-ray spectrometer

OPTIMALISASI MEDIASI ELEKTROKIMIA OKSIDASI MENGGUNAKAN COBALT-SULFAT (BAGIAN I)

ABSTRAK

Mediasi Elektrokimia Oksidasi (MEO) menggunakan mediator $CoSO_4$ dan media H_2SO_4- dapat dimanfaatkan untuk mencegah terjadinya endapan logam cobalt pada katoda melalui pertukaran polarisasi selama waktu tertentu, dalam kasus ini reaktor dirancang pada suhu operasi (20 – 60^oC). Proses elektrolisis berlangsung pada tegangan 6 Volt menggunakan arus DC 3 Ampere selama 2 jam. Hasil penelitian menunjukkan bahwa larutan blanko berubah warna dari merah jambu menjadi biru tua. Endapan logam cobalt pada katoda terjadi setelah proses elektrolisi berlangsung selama 10 menit. Selain itu, penggunaan metode sederhana berupa exchange polarity merupakan alternatif yang terbukti efektif dan dapat digunakan untuk mencegah terjadinya endapan logam cobalt pada katoda.

Kata Kunci: Mediasi Elektrokimia Oksidasi (MEO), Cobalt sulfat, polarisasi, spektrometer X-ray.