

ABSTRAK

Dalam penelitian ini, elektroda yang digunakan jenis *screen printed electrode* perak (Ag), elektroda referensi kalomel (SCE) dan elektroda kounter platina (Pt). Proses pembuatan elektroda Ag/AgCl dilakukan dengan merendam elektroda Ag dan platina pada larutan KCl dengan variasi konsentrasi emulgator arabik gum 1%, 5%, dan 10%, dialiri arus sebesar 9 V selama 30 detik. Pengujian terhadap respon $[Cl^-]$ dilakukan menggunakan metode potensiometri dan voltametri siklik, sementara karakterisasi permukaan elektroda Ag/AgCl dilakukan dengan SEM. Analisa potensiometri menunjukkan penambahan konsentrasi larutan arabik gum sebesar 5% menunjukkan nilai optimum sebesar 56,27 mV/dekade dimana sudah berada dalam standar untuk anion monovalen antara 50 – 60 mV/dekade dan hasil tersebut diperkuat oleh hasil karakterisasi dengan SEM. Pada proses pembuatan menggunakan variasi konsentrasi emulgator arabik gum 10%, dihasilkan bilangan *Nernst* sebesar 57,68 mV/dekade. Berdasarkan hasil penelitian, proses pembuatan elektroda Ag/AgCl yang optimum menggunakan penambahan emulgator sebesar 5%, meskipun pada penambahan konsentrasi emulgator sebesar 10% menghasilkan bilangan *Nernst* yang lebih tinggi, dari segi cost pembuatan lebih besar dengan selisih yang tidak terlalu signifikan. Penelitian ini berguna untuk melihat sifat elektrokimia dari elektroda Ag/AgCl yang bisa dipakai untuk sensor ion klorida atau diaplikasikan pada elektroda pembanding dan elektroda selektif ion.

Kata kunci : elektroda Ag/AgCl, KCl, emulgator arabik gum, variasi konsentrasi



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MAKING ELECTRODA Ag/AgCl BASED ON KCl MATERIALS and GUM ARABIC EMULGATORS

ABSTRACT

In this study, the electrodes used by the type of screen were printed silver (Ag) electrodes, calomel reference electrodes (SCE) and platinum counter electrodes (Pt). The process of making Ag / AgCl electrodes is done by soaking Ag and platinum electrodes in KCl solution with variations of gum arabic emulgator concentrations of 1%, 5%, and 10%, flowing at 9 V for 30 seconds. Tests on the [Cl⁻] response were carried out using the potentiometric method and cyclic voltammetry, while the surface characterization of Ag / AgCl electrodes was carried out by SEM. Potentiometric analysis showed the addition of 5% concentration of arabic gum solution showed an optimum value of 56.27 mV / decade which was already in the standard for monovalent anions between 50 - 60 mV / decade and the results were strengthened by the results of SEM characterization. In the manufacturing process using a variation of the 10% gum arabic emulgator concentration, Nernst numbers were produced at 57.68 mV / decade. Based on the results of the study, the optimum process of making Ag / AgCl electrodes using the addition of an emulgator was 5%, although the addition of an emulgator concentration of 10% resulted in a higher Nernst number, in terms of a larger manufacturing cost with a not too significant difference. This study is useful for looking at the electrochemical properties of Ag / AgCl electrodes that can be used for chloride ion sensors or applied to comparative electrodes and ion selective electrodes.

Keywords: Ag / AgCl electrode, KCl, gum arabic emulgator, concentration variation

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