

Rahardika, A.K., 2018, Pengaruh Glukosa, Urea, dan Asam Askorbat terhadap Analisis Kreatin secara Potensiometri Menggunakan Elektroda Pasta Karbon Termodifikasi *Molecularly Imprinted Polymer* (MIP). Skripsi dibawah bimbingan Dr. Miratul Khasanah, M.Si dan Dra. Usreg Sri Handajani, M.Si. Departemen Kimia, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya

ABSTRAK

Kreatin merupakan jenis asam organik bernitrogen yang dimanfaatkan sebagai zat ergogenik yang dapat meningkatkan kekuatan dan massa otot, akan tetapi jika kadarnya dalam tubuh berlebih dapat menyebabkan terjadinya gangguan pencernaan, kram otot, dan gagal ginjal. Analisis kreatin secara potensiometri dengan menggunakan elektroda pasta karbon termodifikasi *molecularly imprinted polymer* telah dikembangkan. Penelitian ini bertujuan untuk mengetahui pengaruh glukosa, urea, dan asam askorbat terhadap analisis kreatin secara potensiometri menggunakan elektroda pasta karbon termodifikasi *molecularly imprinted polymer* (MIP). MIP dibuat dengan mereaksikan kreatin sebagai *template*, ammonium peroksodisulfat sebagai *inisiator*, dan anilin sebagai monomer fungsional dengan perbandingan mol (2:1:0,1). Elektroda dibuat dengan perbandingan massa karbon aktif, parafin, dan MIP (50:40:10). Elektroda pasta karbon/MIP menunjukkan jangkauan pengukuran pada rentang $10^{-6} - 10^{-3}$ M dengan faktor Nernst dan linieritas berturut-turut sebesar 29,7 mV/dekade dan 0,9649. Urea dan asam askorbat tidak mengganggu analisis kreatin dengan berbagai konsentrasi, sedangkan glukosa mengganggu analisis kreatin dengan konsentrasi 100 kali konsentrasi kreatin. Uji akurasi yang telah dilakukan menggunakan serum darah yang ditambahkan larutan standar kreatin menghasilkan nilai sebesar 85-115%.

Kata kunci: kreatin, (*molecularly imprinted polymer*), elektroda pasta karbon, potensiometri, selektivitas

Rahardika, A.K., 2018, Influence of Glucose, Urea, and Ascorbic Acid on Analysis of Creatine by Potentiometry Using Carbon Paste/MIP Electrode. This Final Project was Supervised by Dr. Miratul Khasanah, M.Si and Dra. Usreg Sri Handajani, M.Si. Department of Chemistry, Faculty of Science and Technology, University of Airlangga, Surabaya.

ABSTRACT

Creatine is a nitrogenous organic acid types and used as ergogenic substance which can increase strength and muscle mass, but if at excessive levels in the body can cause digestive disorders, muscle cramps, and renal failure. Analysis of creatine potentiometrically with carbon paste electrodes modified *molecularly imprinted polymers* has been developed. This research aims to study the influence of glucose, urea and ascorbic acid in analysis of creatine by potentiometry using carbon paste/MIP electrode. MIP was synthesized by mixing creatine as template, ammonium peroxodisulfate as inisiator, and anilin as monomer by mole ratio of (2:1:0,1). The developed electrodes developed was made by mixing carbon, paraffin and MIP with mass ratio of (50:40:10). The carbon paste electrodes/MIP shows a linier dynamic range of 10^{-6} - 10^{-3} M, Nernst factor and linearity of 29.7 mV/decade and 0.9649, respectively. Selectivity test on electrode was studied by adding glucose, urea and ascorbic acid as matrix. Urea and ascorbic acid in various concentration did not interfere on creatine analysis. Glucose at low and normal concentration in blood did not interfere on creatine analysis, but higher concentration disrupted on creatine analysis. Applying the electrode to analyze creatine in the serum showed the accuracy of 85 – 115%.

Keywords: creatine, *molecularly imprinted polymer*, carbon paste electrode, potentiometry, selectivity.