Nanomagnetite As A Carbon Paste Electrode Modifier For Analysis Of Iodide In Cyclic Voltammetry: Effect Of Crystallinity

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This study consists of three main stages, namely synthesis nanomagnetite, electrode manufacture, and testing of magnetite as carbon paste electrode modifier for iodide analysis by voltammetry technique. Synthesis of magnetite nanoparticles carried by hydrothermal technique. To determine the success of the synthesis, the results obtained were characterized by XRD, SEM-EDS. Furthermore, the two types of electrodes made, carbon paste electrode (CPE), and CPE modified magnetite. After that, testing of magnetite as a modifier of CPE for iodide analysis done by observing the effects of amount of magnetite, magnetite crystallinity, scan rate, electrolyte concentration, and the concentration of iodide ions.

Nanomagnetit is synthesed by hydrothermal for 3, 6, and 12 hours with three ingredients: $FeCl_3$, urea, and sodium citrate produce difference degree of crystallinity, 47.81%, 77.15%, and 84.67% respectively. These three ingredients can increase the oxidation peak current of iodide in medium KCl, 1.25 times, 1.5 times and 3 times respectively compared to carbon paste electrodes. With increasing content of nanomagnetit (5, 10, 15%) in the carbon paste electrode, the oxidation peak currents rise linearly to iodide concentration. Data from the slope of the curve between the current peak and root-scan rate, with increased crystallinity will increase the slope of the curve, which is proportional to the increase in effective surface area of electrode. Nanomagnetite with high crystallinity (about 85%), has linierity for iodide concentration and high selectivity towards NaCl, and KBr

KEYWORDS: Iodide, nanomagnetite, crystallinity, cyclic volammetry, carbon paste

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