Distinctive Routs:Electrochemical and Spectrophotometric Studies and Dissociation Constants Determination of Some Aminopyridine Azo-Dye Derivatives in Aqueous Media

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doi: 10.20964/2016.06.49

Received: 11 December 2015 / Accepted: 23 January 2016 / Published: 4 May 2016

The electrochemical behavior of some azo compounds derived from 2-amino-3-hydroxypyridine in Britton and Robinson buffer series containing 20% (v/v) ethanol was investigated at the mercury electrode using distinctive techniques (DC, CV and DPP) to evaluate the effect of medium and substituents on the reduction process and suggestion of the electrode reaction mechanism. The obtained results indicated that these compounds were reduced undergo an irreversible 4-electron polarographic wave within the entire pH range leading to the cleavage of the N=N center. The NO₂ derivative is reduced via a single 8-electron wave and the hydroxylamine group is obtained. The CV data showed that a single cathodic peak is obtained at all pH representing the reduction of the azo center as well as the nitro group for azo compound (II). The total number of electrons involved in the reduction process was determined by controlled potential coulometry. The dissociation constants values (pK_a) of these compounds were determined spectrophotometrically and potentiometrically at room temperature.

Keywords: 2-amino-3-hydroxypyridineazo dyes, Polarography, Cyclic voltammetry, Spectrophotometry, Potentiometry, Dissociation constants.

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