Abstract

The present study aims to preparation of some azo and azomethine compounds derived from 2-amino-3-hydroxypyridine, 4-aminoquinaldine and 4-hydroxyquinaldine.

The electrochemical behavior of these compounds is investigated using deferent techniques (DC, CV and DPP) to define their redox potential ($E_{1/2}$&E_p), suggestion the electrode reaction mechanism and studying the effect of substituent and medium on the electrode reaction. The polarograms of azo compounds (I), (II), (III) and (V) are consisted of a single reduction wave, while the polarogram of azo compound (IV) is consisted of a two reduction waves. For azomethine compounds (III) and (V) the polarograms shows a single reduction wave. For azomethine compounds (I) and (II) the polarograms are consisted of two cathodic waves in alkaline media, while for the azomethine compound (IV) three cathodic waves were observed. The study is also extended to determine the dissociation constants value (pk_a) of these compounds using spectrophotometric measurments. The absorption spectra of azo and azomethine compounds investigated in buffer solutions of varying pH (2-11) were recorded within the range 200-700 nm. All the investigated compounds exhibited three bands. The first band is due to the local excitation of the π - π^* transition within the aromatic moiety, while the second and third bands are attributed to the charge transfer (C.T) interaction within the whole molecule, and the C.T bands are sensitive to both medium and structure. The study is also included the the potentiometric measurements of azo and azomethine compounds under investigation to determine the dissociation constants values (pk_a) of these compounds. The results indicated that all the investigation compounds (except azomethine compounds (IV) and (V)) showed two pk_a values, the first one is corresponds to the protonation of the N-atm in pyridine or quinoline rings, where as the second one is due to the ionization of the phenolic OH group in the pyridine or phenyl rings. The values of pk_a determined from the potentiometric measurements are in a good agreement with those obtained from spectrophotometric methods.