Available online at **www.joac.info**

ISSN: 2278-1862

Journal of Applicable Chemistry

2023, 12 (6): 971-976

(International Peer Reviewed Journal)

Determination of Acid Dissociation Constant of Benzimidazole-Amino Acid Conjugate Ligands by Spectrophotometric and Cyclic Voltammetric Method

Sabithakala Thatituri*, Pushpanjali Kale

Department of Chemistry, Jawaharlal Nehru Technological University Hyderabad-UCEST, Hyderabad- 500085, **INDIA**

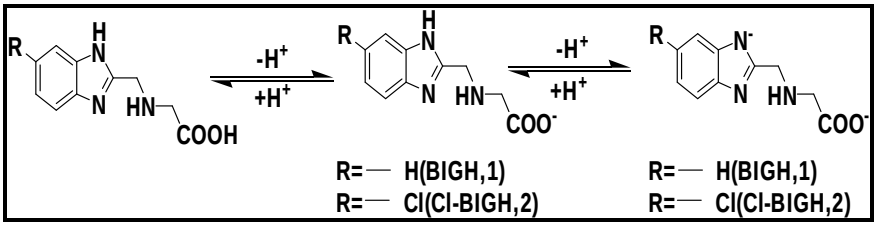
Email: sabithakalatatituri@jntuh.ac.in

Accepted on 15th November, 2023

ABSTRACT

*The acid dissociation constant is the most frequently used physicochemical parameter, and its determination is of interest to a wide range of research fields. The acid dissociation constant (pKa) of the of 2-((1H-benzimidazol) methyl amino) acetic acid (**1**) and 2-(((6-chloro-benzimidazol)methyl) amino) acetic acid (**2**) were determined using UV-Visible spectrophotometry and Cyclic voltammetry. Graphical method used to estimate the acid dissociation constant (pKa). In UV-Visible spectrophotometry graph was plotted taking absorbance vs. pH at the λ_{max} (218 and 245nm), pKa was obtained at the point of intersection of these curves. In Cyclic voltammetry the graph was plotted for oxidation peak potential as a function of pH, pKa was determined from the intersection point of the linear segments of peak potential and pH plots. The resulting pKa of compound **1** is 2.45 in spectrophotometric method and 2.48 in cyclic voltammetric method, and for compound **2**, 2.25 in spectrophotometric and 2.24 in Cyclic voltammetric method. Further, at higher pH deprotonation of another hydrogen atom from the nitrogen of benzimadazole ring observed in spectrophotometric method.*

Graphical Abstract:



Oxidation mechanism of Ligand 1 and 2.

Keywords: Buffers, pH, pKa, Synthesis, Electrochemistry, Oxidation potential.