



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

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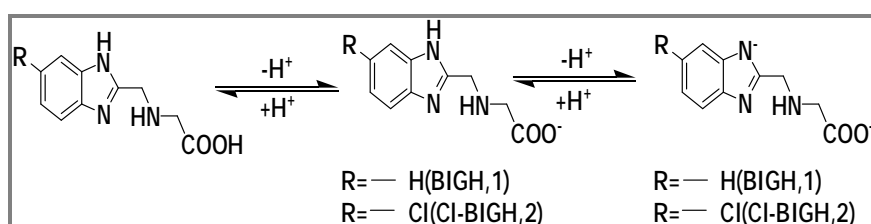
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ABSTRACT

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 (pK_a) 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 (pK_a). In UV-Visible spectrophotometry graph was plotted taking absorbance vs. pH at the λ_{max} (218 and 245nm), pK_a 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, pK_a was determined from the intersection point of the linear segments of peak potential and pH plots. The resulting pK_a 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 benzimidazole ring observed in spectrophotometric method.

Graphical Abstract:



Synthesis of 2-((1H-benzimidazol)methylamino) acetic acid.

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