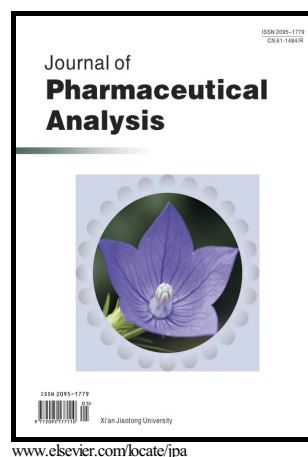


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**Determination of pKa values of alendronate sodium in aqueous solution by piecewise linear regression based on acid-base potentiometric titration**

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**Abstract**

As a mono-sodium salt form of alendronic acid, alendronate sodium presents multi-level ionization for the dissociation of its four hydroxyl groups. The dissociation constants of alendronate sodium were determined in this work by studying the piecewise linear relationship between volume of titrant and pH value based on acid-base potentiometric titration reaction. The distribution curves of alendronate sodium were drawn according to the determined pKa values. There were 4 dissociation constants ( $pK_{a1}=2.43$ ,  $pK_{a2}=7.55$ ,  $pK_{a3}=10.80$ ,  $pK_{a4}=11.99$ , respectively) of alendronate sodium, and 12 existing forms, of which 4 could be ignored, existing in different pH environments.

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