BUSITEMA UNIVERSITY
Pursuing Excellence

P.O.Box 236, Tororo
Gen:+256-454448842
Dir: +256-454448864
Mob: +256-782999874
Fax: +256-454436517
Email:ar@acadreg.busitema.ac.ug
Website:www.busitema.ac.ug

EXTRACTION OF AN ACID BASE INDICATOR FROM *Passiflora edulis* PEELS.

BY

LUMANYIKA DESMOND

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SUPERVISOR;

MR. MUSAGALA PETER

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DECLARATION

I, LUMANYIKA DESMOND, hereby declare that this study is original and has not been submitted for any other degree award to any other University before

Signature ……

Date …….

This dissertation has been submitted for examination with the approval of the supervisor

Mr MUSAGALA PETER

Signature ……

Date …….

DEDICATION

I dedicate this research to my lovely mother Mrs Nsubuga Joweria, the late father Mr Luutu Kiwanuka Wilson.

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LIST OF ABBREVATIONS

HPLC	High performance liquid chromatograph
GC-MS	Gas chromatography- mass spectrometer
FTIR	Fourier transform infrared spectrometer
UV-Vis	Ultra violet- visible spectrometer
ANOVA	Analysis of variance
SD	Standard deviation
SSB.	Between sample sum of squares
SSW	Within sample sum of squares
BU	Busitema University

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ABSTRACT

In routine experiments synthetic indicators are the choice of acid base titrations. But there are some limitations like environmental pollution, availability and higher cost which lead to utilisation for natural compounds as acid base indicators. Natural indicators are easy to prepare, easily available and have no toxic effects. The present work highlights the use of the ethanolic extract of the Passiflora edulis peels as a natural acid-base indicator in acid-base titrations. The Passiflora edulis fruits were identified, washed, cleaned by distilled water, peeled and the 50gm of the purple peels were soaked in 100 mL of 97% ethanol for about 24 hours. The resulting solution was filtered using Whatman no.4 filters. The resulted ethanolic extract was tested for its acid base indicator properties and found to turn pink and green in acidic and basic media respectively. The extract was then used as an acid-base indicator for strong acid versus strong base and strong acid versus weak base titrations. For comparison purposes, Phenolphthalein and methyl orange indicators were used in the same titrations as for the Passiflora edulis extract. The experimental data obtained from both titrations using the three indicators were analysed using ANOVA and results showed that there was no difference between the titre values of the Passiflora edulis indicator and the other two indicators. Therefore, the indicator was found to be a potential substitute for methyl orange and phenolphthalein for titrations of strong acid versus weak base and strong acid versus strong base. Hence, Passiflora edulis peels extract as a natural indicator is found to be a very useful, readily available, non-hazardous, economical, simple to prepare and accurate for the acid-base titrations.

Chapter 1

INTRODUCTION

1.1 Background

pH is a measurement of the level of acidity or alkalinity in solutions. pH measurement has many applications. These includes, pharmaceutical and educational applications, agricultural, wastewater, environmental analysis and food science.

In the field of chemistry, pH measurement is applied in titration during volumetric analysis to analytically determine acid interaction with bases. pH is equal to the negative logarithm to base ten of the concentration of hydrogen ions in solution. Indicators are chemical substances that show the extent of a chemical reaction. pH indicators change colour when the pH in the medium changes.

Indicators used to determine the end point during the titration of an acid against a base are called acid-base indicators. They change colour with variation in pH thus the name pH indicators. pH indicators are detectors of hydrogen or hydronium ions in solution according to Arrhenius. Indicators are weak acids therefore dissolve partially when in aqueous solution. Considering Hln as an acid-base indicator in solution, the equilibrium in the equation below is established with its conjugate base.

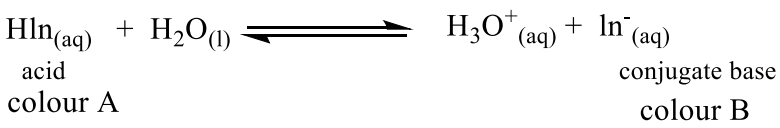

Figure 1:1 showing the equilibrium an acid Hln establishes with its conjugate base.

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