

Use of Petunia Flower Extract as a Natural Indicator in Acid Base Titration

Tahseen Abdul Rehman Dhansay

M. M. Jagtap College of Arts, Science and Commerce, Mahad-Raigad, Maharashtra, India

Abstract: *The synthetic indicators are the main preference for acid base titration and qualitative analysis but due to their toxic effect (generally unnoticed) in human being as well as in environment and the higher cost, the use of natural indicator started in the titrimetric assay. The present investigation explores the use of ethanol extract of Petunia flower as natural indicator in acid base titration. The natural indicator is simple to extract out, non toxic and available easily. The investigation also shows that the natural indicator have great potential and shows promising results when compare to synthetic indicators. In the acid base titration natural indicators gives sharp color change at equivalence point. According to all the evidence obtained after titrimetric analysis that natural indicator shows effective and accurate result in compare to synthetic indicators. The advantage to use natural indicator is they can be prepared freshly, economical as well as ecofriendly..*

Keywords: Acid-base titrations, Natural indicator, Synthetic indicator, Ethanol extract

I. INTRODUCTION

Indicator is basically a constituent which are commonly used to indicate the accomplishment of a chemical reaction during titrimetric analysis, frequently by changing of color. Now a day's commonly available indicators are expensive and shows some toxic and hazardous effect to the users as well as environment [1]. To overcome the use of these available indicators and avoids there unwanted effects may enhance the attention to searching and produce indicator from natural sources. These natural indicators would be easily available, easy to prepare, simple to extract out, less toxic, inexpensive and eco-friendly. Most of the pH indicators may weak organic acids or bases, which have tendency to accept or donate electrons. The color change in the titrimetric process may attribute to their acidic and basic property. Indicators are the agent needed for the quantitative analysis in research laboratories as well as determination of equivalent point between the reacting species [2]. Analysis carried out by determining the volume of solution of accurately known concentration which is required to react quantitatively with a measured volume of a solution of the substance to be determined with the use of indicator by the color changing property in different(acid and base) medium. The commonly used synthetic indicators have some harmful effects which is generally unnoticed or ignored. For example, a commonly used indicator are usually dissolved in alcohol it is harmful to human as well as surrounding environment. All of these reasons can indicate the harmful effect of the synthetic indicator in human as well as environment [5]. Because of these unwanted and toxic effects the use of naturally produced indicator comes in light. So the goal of the current study is to synthesize indicator from natural sources i.e. plants, mainly by flowers. These natural indicators are easy to synthesize and didn't show any harmful and toxic effect. Accurateness of the titration mainly depends upon the accuracy in detection of end point. At end point the moles of acid exactly neutralize the moles of base in the solution and this point is detected by some indicator. After present experiments favorable results were obtained when it was compared against standard synthetic indicators. for this titration purpose Petunia lower extract is used. following material and method is carried out the titration.

II. MATERIALS AND METHODS

Plant materials:

Fresh Petunia flower extract.

Reagents:

Hydrochloric acid, sodium hydroxide, ammonium hydroxide, acetic acid and ethanol. The study was performed using

Analytical grade reagents and the whole experimental work was carried out using the same set of glassware's used for extraction and titration process.

Method:

All the flowers were collected and cleaned separately with distilled water and petals of these flowers were kept in sunlight until to get completely withered. The dried petals were grinded into fine powder with a mechanical blender and then triturated in mortar and pestle and macerated in ethanol for 24 hrs . The resulting solution was filtered through muslin cloth and the resulted extract was used as natural indicator for acid-base titration. The extract of flowers was preserved in amber color glass bottle with tightly closed container and stored in room temperature or in cool place away from sunlight. titrant of 10 ml with 2 to 3 drops of indicator of both natural and standard indicator (Phenolphthalein and Methyl Orange) was titrated against two pair of acid- base. (HCl and NaOH; CH₃COOH and NH₄OH) [12]. The results of titrimetric analysis depicted in the Table 1. Each titration was repeated for 3 times. The results were recorded as mean ± SD.

III. RESULT AND DISCUSSION

The indicator were synthesized by using natural sources (flower extract) and screened for acid base titration and the obtained results were compared with synthetic standard indicator i.e. phenolphthalein and methyl orange. The end points of the completion of reaction using natural indicators were near to the ending titration results obtained by standard indicator. The difference and variation in standard deviation between of the end point of the standard and the natural synthesized indicator was very less, which shows that the naturally synthesized indicator may have great potency as compare to standard indicators like phenolphthalein and methyl orange. The result may also be accomplished that the natural indicator may suitable for utilization as acid base titration analysis. The end of the analysis or chemical reaction may basically denoted by the changing the color which usually done by addition of indicator, the change in color shows end point of titrimetric analysis was due to presence of anthocyanin flavonoid and other chemical constituents. The titrant and titrate with the indicator shows intense and sharp color change, which shows the end of titration. All the evidence shows that the naturally synthesized indicators are equally significant and effective as standard and other chemically synthesized indicator for acid base titrimetric analysis and the chemically synthesized indicators could be replaced successfully by the indicator which synthesized by using flower extract. The flower extract forms easily and the prepared indicator having some characteristics features like economical, nontoxic, not show any harmful effect on human and their surrounding environment, ecofriendly as well as the result obtained by natural indicator was as accurate as chemically synthetic indicators. end point will be from pink to colourless

Table 1: Acid base titration chart

Burette readings	1	2	3	C.B.R
Initial	0.0	0.0	0.0	9.5
Final	9.4	9.5	9.5	
Difference	9.4	9.5	9.5	

IV. CONCLUSION :

According to the results obtained from acid base titrimetric analysis, it was concluded that the color change produced by natural indicators should be sharp and intense which denote end point of the titrimetric analysis. We also concluded that the plant indicators which give positive results at neutralization can be used as a substitute to synthetic indicators.

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