**Allium cepa L. As Acid Base Indicator**

Koo Thai Hau , Ling Jia Yi, Gan Lui Nam

SMK Johor Jaya 1 Johor, Malaysia

E-mail: [Happy\_angel0831@hotmail.com](mailto:Happy_angel0831@hotmail.com)

***Abstract***

In a titrimetric analysis, acid-base indicators are commonly used to determine the end point of a particular neutralization reaction as they can change into different colours at different pH levels. The ones used in the laboratory are expensive and inconvenient for the people to obtain in daily lives. After some research and reading, it was found out that Rhoeo discolor contains a pigment named anthocyanin which can change into different colours at varied pH levels. This enables Rhoeo discolor to act as an acid-base indicator. In this study, the researchers aim to determine whether a natural plant (Allium cepa L.) can also act as an acid-base indicator just like Rhoeo discolor. Keywords: Acid-base indicator, anthocyanin, Allium cepa L.

Keywords: acid; Ph level; indicator

**Introduction**

Allium cepa L. which is commonly known as red onion/purple onion has purplish red skin and white flesh tinged with red. It is available throughout the year and can be stored for three to four months at room temperature. The red colour comes from anthocynanidins such as cyanidin. Red onions are high in flavonoids. Maarit (2005) and Wada (2002) stated that most of the red, blue and purple plants contain a class of organic pigments, anthocyanins which changes its colour with pH. It is used as an acid-base……

**Problem Statement**

Consumers have to use acid-base indicator in order to determine the pH of the household items. This is significant to safeguard the health of the family members. Some plants can be used as acid-base indicators. Specific pigments found in plants enable them to function as acid-base indicators. The main argument of this research is the effectiveness of Allium cepa L. as an acid-base indicator.

**Solution to the Problem**

In this research, Allium cepa L. is used to test the pH of different chemicals and other household items. This ensures that he consumers can use this natural acid-base indicator as a better, cheaper and convenient way to determine the pH value of the chemicals.

**Planning Structure**

The apparatus that we have used in the projects are measuring cylinder, knife, wire gauge, bunsen burner, retort stand, tripod stand, beaker, filter funnel, test tube, test tube rack, stirrer and dropper. The materials that we have used are Allium cepa L., 1.0 M of HCl, distilled water, 1.0 M of NaOH and filter paper.

**Knowledge Impact**

We have used the existing knowledge to further enhance the use of Allium cepa L. to function as a cheaper and conveniently-handled acid-base indicator.

**Contribution to Society and Country**

This product is very economical and yields results fast. It is a non-commercial and easily available acid-base indicator that can be used by consumers to determine the pH of household items in order to choose the most suitable household items for their family members.

**Cost Impact**

We have estimated that the cost needed for the experiment can be divided into two parts which are household cost and industry cost. For households, the total cost is zero. For industries, the total cost is RM30 which is spent on buying materials and apparatus.

**Commercialization Potential**

This natural acid-base indicator is very useful to help skin-allergic people choose the suitable household items such as shampoos, hand cleaner, soaps and so on. This product has a great potential in the market as the number of people with skin allergies increases every year.