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## 優勝作品專輯(國外作品)

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參展科別	化學科
作品名稱	The research of Ube anthocyanin characteristics and utilization
得獎獎項	四等獎

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# **ABSTRACT OF EXHIBIT**

## **TAIWAN INTERNATIONAL SCIENCE FAIR**

Anthocyanin is a water soluble pigment that may appear in various colors such as red, blue, and purple according to the pH. Ube is a fruit in the Philippines that is 3rd of the most cultivated crops. Since Ube contains a lot of anthocyanin, it helps to make the anthocyanin solution.

As Anthocyanin reacts to the oxygen quickly it is also used as air pollution indicator because it changes its color according to what substances they are attached to it. To check if the solution reacts to the pollution such as SO<sub>2</sub> and NO. When those pollutions are made artificially, examining the intensity of the anthocyanin solution depending on different Mol of the pollutions was able. The power of penetration of lights though the UV-VIS spectrophotometer increases according to the number of molecules of SO<sub>2</sub>, and also NO. To examine the change of intensity of anthocyanin solution in actual atmosphere, the solutions were exposed outside for several hours. The power of penetration decreases when exposed to an actual atmosphere. The other substances and oxidation were the causes of the changed in color of the solution

To facilitate the usage of anthocyanin solution efficiently, it should be preserved, so that the density of specific color will be preserved when used as real air pollution indicator. In order to check what kinds of chemicals can preserve the anthocyanin solution; different kinds of strong acids, strong base, salts, and metals were added to the solution. After getting the data, the characteristics of the chemical which preserved the anthocyanin were scrutinized, than compared to the density of pure anthocyanin solution.

To use anthocyanin as air pollution indication as a solid, the Korean traditional paper and cloth were dyed using ube which contains lots of anthocyanin than checked the pixel of red, green, and blue color. Firstly, chose 6 different salts. And then filter and boiled the anthocyanin solution. And then put each different salt in each paper. After that, dried the paper and check the difference of pixel of each paper. As a result, Calcium hydroxide (CaOH<sub>2</sub>) has highest pixel point. So, using calcium hydroxide to dye clothes is useful and it's also useful for the air pollution indicator through the

experiment. Especially it reacts to Nox and Sox, according to this experiment, it can use for eco-friendly air pollution indicator.

## 評語

Anthocyanin is used to detect SO<sub>2</sub> and NO for environmental sensor and also to dye the clothes with good quality as compared to conventional dying method. The work has achieved some results that are applicable in detection of air pollution and cloth dying procedures.