CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35702

Project Title

Anthocyanin and the Behavior of Electrons: Effect on the Amount of Electric Current Produced after Electrolysis

Abstract

Objectives/Goals

This study is aimed to determine if more electric current is produced with more concentration of anthocyanin after electrolysis.

Methods/Materials

Anthocyanin was extracted by boiling red cabbage. I named this the 100% anthocyanin liquid (Absorbance 1.27 at 580 nm wavelength measured by iPhone spectrometer software) to use for basis and I made 50% and 33% anthocyanin liquids by adding distilled water. One gram of agar power and 0.59 grams of table salt were added to make 100 ml of anthocyanin-agar mediums of each concentration level. The 0% anthocyanin-agar medium has no anthocyanin, but has agar and salt.

Using these 4 levels of solid anthocyanin-agar mediums as electrolyte solutions, the procedure of electrolysis was conducted with electrodes made with aluminum foil. After 10 minutes of electrolysis, the alligator clips attached to the battery were reconnected to the digital current meter and the electric current was measured for 10 minutes.

Results

For the first 60 seconds, all of the 100%, 50%, and 33% anthocyanin-agar medium settings generated more electric current than the 0% medium setting. The 100% medium generated most electric current by 31% at the start, and secondly the 33% medium by 20%, and lastly the 50% medium by 7%, compared to the 0% medium which produced the lowest electric current.

Conclusions/Discussion

My hypothesis, which was that more concentration of the anthocyanin in agar would produce more electric current after electrolysis, was partly supported. This can be restated that the anthocyanin increases the electric current after electrolysis but the relationship between the level of anthocyanin concentration and the produced electric current might not be linear, unlike I expected.

Based on my literature research, it seems that this experiment is about figuring out the effective electrolyte part of mechanism in aluminum electrolytic capacitors. If this is correct, the electric current comes from static electricity near the surface of aluminum electrodes. Charged anthocyanin near electrodes must have helped to increase the electric current. Future experiments could include more concentrated anthocyanin in the electrolyte medium. I would like to find out if there is anything anthocyanin can contribute to store electricity.

Summary Statement

My project shows that the anthocyanin in electrolyte solutions increases the electric current after electrolysis.

Help Received

My parent purchased the materials and occasionally became my assistant for my experiment.