

## Generation of electricity from juice of star apple and its characterization with pH effect in human stomach

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### Abstract

Developing of alternative electric energy can be packed in a practical form like battery using of Carambola/star fruit. Changing the concentration of Carambola juice we measured the potential difference of electrochemical cell. After characterization of that juice from fruit observed some pH effects of our stomach. The pH level pH our stomach pH 2 is normal, but alter reduce of pH in our stomach creates digestion problems and creates the lower blood pressure. If we take more star apple fruits at a time that can reduce the pH level of our stomach and that can affect the buffer of our body fluid.

**Keywords:** Star apple, Electricity, pH and human stomach acidity.

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Date of Submission: 01-08-2020

Date of Acceptance: 16-08-2020

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### I. Introduction

Star fruit is one of the common fruit named in Bangladesh. Local named of that fruit is Carambola or kamrangga. This Bangladeshi variety of Carambolas contain huge amount of organic acid. Using this organic acid electrical energy is produced. This electrical energy is created because star fruit has a high acidity level to be able to conduct ions and electrons are there on a piece of copper and zinc. Thus create an electric current. On this average, 04 points star fruit is capable of creating an electrical voltage up to 4.0V which is equivalent with two or three dry cells. So developing alternative electric energy can be packed in a practical form like battery. So it can be developed as one of the energy alternatives that impact electricity consumption and help the small family. After characterization of that juice from fruit observed some pH effects of our stomach. The pH level of our stomach pH 2 is normal, but alter reduce of pH in our stomach creates digestion problems. If we take more star apple fruits at a time that can reduce the pH level of our stomach and that can affect the buffer of our body fluid.

Can we imagine how your life would change if batteries did not exist? If it were not for this handy way to store electrical energy, we would not be able to have all of our portable electronic devices, such as phones, tablets and laptop computers. So many other items from remote-control cars to flashlights to hearing aids would also need to be plugged into a wall outlet in order to function. Using this organic acid electrical energy is produced. This electrical energy is created because star fruit has huge organic acids. Before we know that electricity is produced from the fruit and vegetables[01]but not Specific fruit Carambola. It is proved that by the experiment lemon battery also produced electricity[02].

### II. Materials And Methods

#### Required materials:

- ✓ 04 Pieces of Copper Electrode
- ✓ 04 pieces of Zinc electrode
- ✓ Water
- ✓ Cork sheet
- ✓ Scissors
- ✓ LED
- ✓ At least one or two carambola(preferably with a thin skin)
- ✓ Plate
- ✓ Knife (and an adult's help when using it)
- ✓ Ammeter

- ✓ pH meter
- ✓ Mortar
- ✓ Cloth for filtration

**Procedure:**

a. Place the carambola on its side on a plate and have an adult carefully use the knife to make a small cut near the middle of the star apple. By the process of pressing of cutting portion we collect the extract of carambola. The extract is filtrated by cloth filter. Extracts were diluted by distilled water to 10-1, 10-2 and 10-3 before use. All experiments were repeated twice.



b. Take a beaker and add 200ml Diluted juice of Carambola. We used two electrodes of copper and zinc in here. We emerge two electrodes in the solution such a way that they could not touch each other. An electric wire is connected between them.

c. We prepare 04 points or 04 set of experiments and connect them series way.



- d. Overall voltage is measured after series connection.
- e. If you have an LED (light-emitting diode) available, investigate how many carambola batteries are needed to light it.



#### Preparation of buffer solution;

Prepare 0.25M, 100ml sodium acetate and Acetic acid solution and keep it safely in lab. If we add 5ml juice of star apple in Buffer solution. 4 to 5 times we add the 5 ml juice of star apple. We used the pH meter for measuring the pH level of each time respectively and record it.

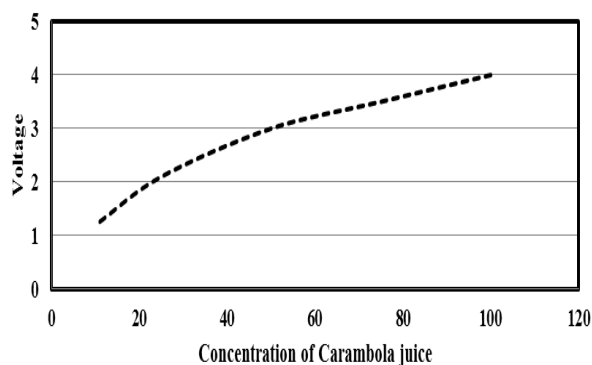


### III. Results and Discussion

The battery just made a copper and Zinc electrode separated by electrolyte Carabolla juice. It will generate electricity as soon as the electricity has a path to flow from one electrode to the other. By connecting our Carrabolla battery to your fingertip, you allowed the small amount of electricity it generates to run through your body. This amount of electricity can create a tingling feeling in a fingertip. This electrical energy is created because star fruit has a high acidity level to be able to conduct ions and electrons are there on a piece of copper and zinc. Thus create an electric current. On this average, 04 points star fruit is capable of creating an electrical voltage up to 04 volts which is equivalent to two or three dry cells. So developing alternative electric energy can be packed in a practical form like battery. So it can be developed as one of the energy alternatives that impact electricity consumption and help the small family.

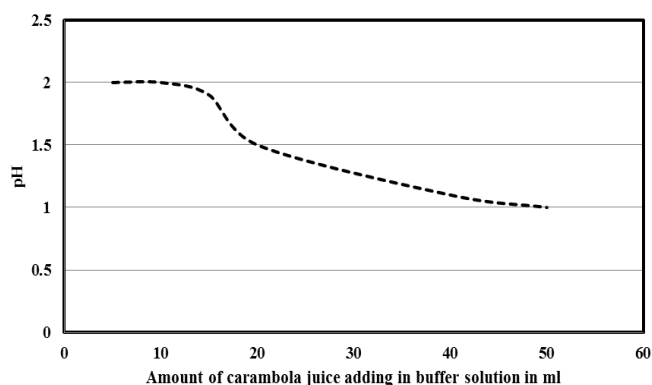
1. We measured the voltage 25% , 50% and 80% and 100% on the carambola juice using voltmeter and the voltage at the 04 point of Series connection and recoded it in following table

Sr. No.	Concentration of juice (%)	Voltage
01	100	4.0
02	75	3.5
03	50	3.0
04	25	2.1
05	10	1.2



- We add carefully the carambola juice in the acetic acid and sodium acetate buffer solution of 200ml pH 2 carefully and observed that 10ml Carrabolla solution does'tchange bufferpH.
- If we again add the 15ml, 20ml, 25ml,40ml and 50ml Carabolla juice in the buffer solution than that affect the buffer of and the pH is changed. We recorded the PH after adding the Carrabolla juice.

Sr. No.	Amount of carambola juice adding in buffer solution in ml	PH
1	5	2
2	10	2
3	15	1.9
4	20	1.5
5	40	1.1
6	50	1.0



- If the buffer pH of our Stomach is reduced from pH 2 that the amount of acid level is reduced that can affect that blood pressure and well as digestion.
- So if anybody takes 04 or 05 carambolas of Bangladeshi variety at a time that can affect the stomach acidity or blood pressure.

#### IV. Conclusion

So developing alternative electric energy can be packed in a practical form like battery. So Carambola/star fruit can be developed as one of the energy alternatives that impact electricity consumption and help the national electricity consumption of our country. After characterization of that juice from fruit observed

some pH effects of our stomach. The pH level pH our stomach pH 2 is normal, but alter reduce of pH in our stomach creates digestion problems and creates the lower blood pressure[03]. If we take more star apple fruits at a time that can reduce the pH level of our stomach and that can affect the buffer of our body fluid[04]. So we should not take more star apple at a time.

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K. M. Salim Reza, et. al. "Generation of electricity from juice of star apple and its characterization with pH effect in human stomach." *IOSR Journal of Applied Chemistry (IOSR-JAC)*, 13(8), (2020): pp 09-13.