



# Mysterious Amylase

Additional Problem No. 24

Team Indonesia- Labsky

5<sup>th</sup> IYNT 2017

# + Problem



- Select a chemical test for starch, find convenient sources of amylase and starch, and investigate how much time of exposure to amylase is needed for the starch test to not be observed.

# + Key Points



- Amylase
  - Chemical test for starch
- Convenient sources of amylase and starch
  - How many times of exposure

# + Theory



- Chemical test: Iodine turns dark-purple to black from red when in contact with starch. If not it will turn yellow-orange.



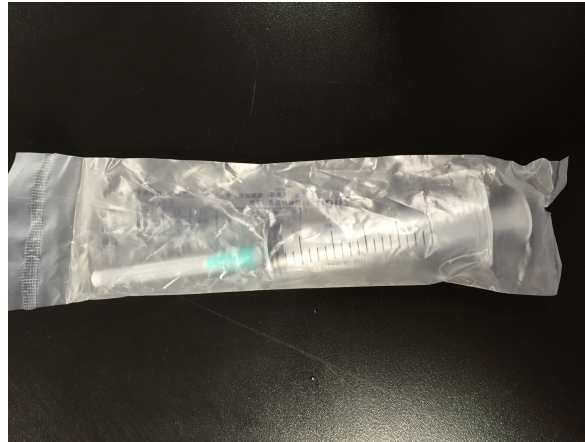
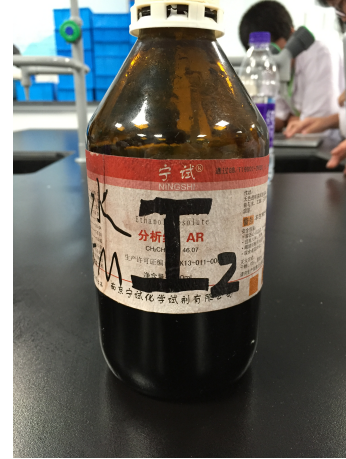
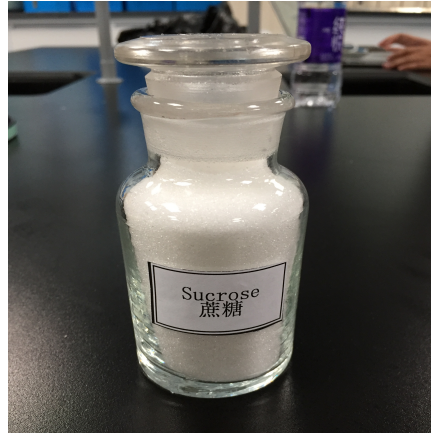
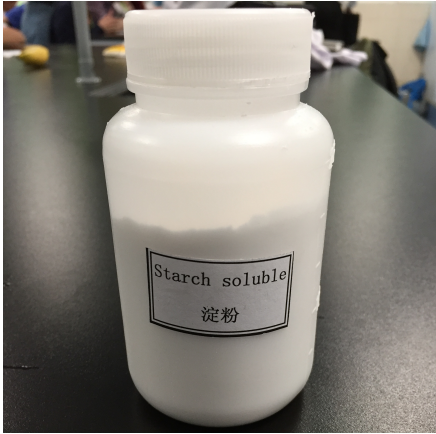
# Experiment 1



- Hypothesis: Banana, bread, and starch will turn black, however sucrose and corn syrup will turn yellow-orange
  - Aim: Find out a chemical test for starch to examine convenient sources of starch
  - Chemical Test: Mixture with Iodine
  - Control: - pure soluble starch
  - Test subjects: - Bread, corn syrup, banana, sucrose
- ◆ Procedure:
1. First, prepare materials.
  2. Then, take the syringe and drop 5 drops of Iodine
  3. Observe the chemical reaction



# Apparatus



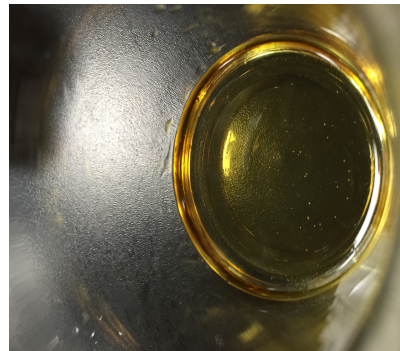
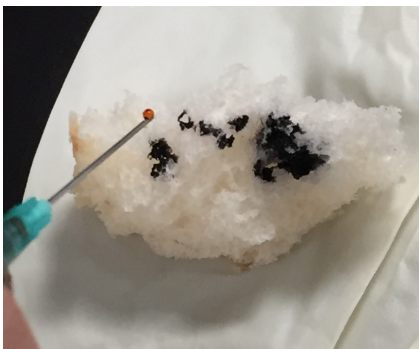


# Data Analysis



## EXPERIMENT 1 =

- Black spots appear on bread when added 1.5 ml of iodine.
- Corn syrup appears orange-yellow when added 1.5 ml of iodine.
- Black spots appears on banana when added 1.5 ml of iodine
- Orange spots appear on sucrose when added 1.5 ml of iodine



# + Conclusion



- Contains starch

1. Banana
2. Bread

- Does not contain starch

1. Sucrose
2. Corn syrup

Convenient sources of starch are including: breads and bananas.



# + Theory



## WHAT IS AMYLASE?

- Amylase is an enzyme that catalyses the hydrolysis of starch into sugars.
- Amylase is produced in the saliva glands and pancreas of some mammals. Therefore, we used our own saliva.

## WHAT IS STARCH HYDROLYSIS?

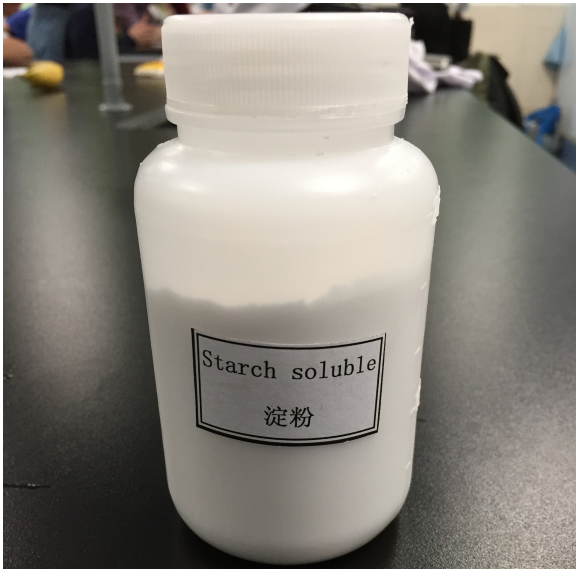
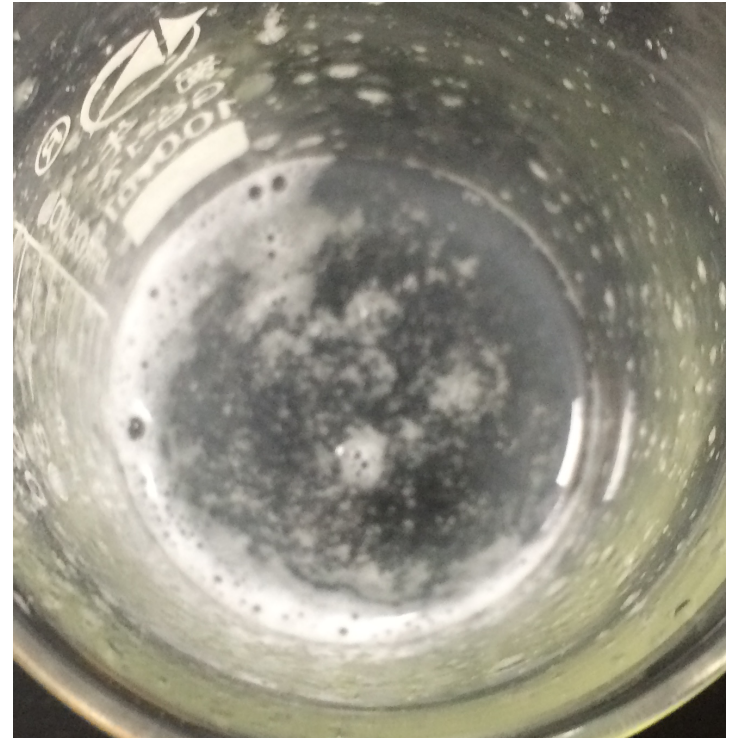
- A process when chemical bonds of the starch (glycosidic) breaks into glucose and fructose.

# + Experiment 2



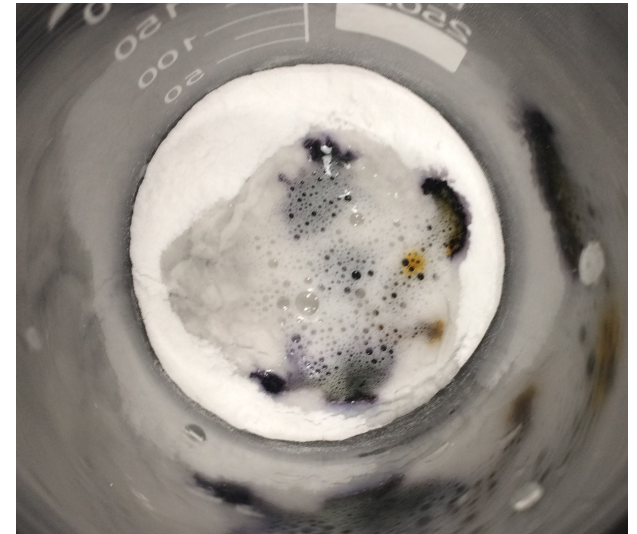
- Aim: To find out how much time of exposure to amylase is needed for the starch test to not be observe.
- Test Subject = Starch
- Procedure =
  1. First, put starch into a beaker.
  2. Add 1.5 ml saliva into the beaker
  3. Add one drop of iodine.
  4. Repeat steps 2 and 3

# + Apparatus



# + Data Analysis

Times of exposur	Observation of
1 (1.5 ml)	No change (black spots)
2 (+1.5ml)	Some spots turns light blue
3 (+1.5ml)	Some spots turns slightly brown
4 (+1.5ml)	Yellow spots appear





# Conclusion



- 4 times exposure is needed for this starch test.
- The more times it is exposed, the less blue and more yellow the iodine turns.
- Alpha amylase, which is the amylase present in the human saliva, can catalyze the hydrolysis of starch into glucose and fructose.

# + References

- **Wikipedia.com**

