

**STUDENT
PRACTICAL SHEET**

NAME

FORM

DATE

Investigating the atmosphere for lettuce pinking

Introduction

Iceberg lettuce is a popular addition to salads and fast food garnishes. Once the leaves are cut they start to go pink as the cut surfaces react with oxygen in the air. This type of chemical reaction is called oxidation.

Storing the cut lettuce in a different gas to air can increase the shelf life of the lettuce.

Aim

To investigate the rate of oxidation of cut iceberg lettuce in different environments.

Equipment

- 4 x Stopped boiling tubes labeled 'Gas A' containing oxygen,
- 4 x Stopped boiling tubes labeled 'Gas B' containing hydrogen
- 4 x Stopped boiling tubes labeled 'Gas C' containing carbon dioxide
- 4 x Stopped boiling tubes labeled 'Gas D' containing air
- Splints
- Limewater
- Dropping pipette
- Boiling tube rack
- Bunsen burner and safety equipment
- Freshly shredded iceberg lettuce



Safety: Splash proof eye protection must be worn as limewater is an irritant.
See CLEAPSS Student Safety Sheet 32.

Method

Identifying the gases

1. Add about 0.5cm³ of limewater to a boiling tube of each gas and shake. The gas which causes limewater to turn milky must be carbon dioxide.
2. Hold a lighted splint over the open boiling tube for each gas. The gas which causes a squeaky pop sound must be hydrogen.
3. Hold a glowing splint into each open boiling tube for each gas. The gas which causes the splint to re-light must be oxygen.
4. Record your observations in the table below:

GAS	A	B	C	D
TEST				
Limewater				
Lighted Splint				
Glowing Splint				

Investigating lettuce pinking

5. Add a few pieces of chopped up iceberg lettuce to a new boiling tube of carbon dioxide, hydrogen, oxygen and air. Replace the bung.
6. Leave the sealed boiling tubes in a rack for a day and then inspect the level of pinking.

Questions

1. Which gas causes the pinking to be the most?

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2. Which gas reduced the rate of pinking the most?

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3. What safety concerns might you have in using hydrogen as an atmosphere for bags of salad?

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4. How could you improve this experiment to measure the pinking quantitatively rather than qualitatively?

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TEACHERS NOTES	NAME	FORM	DATE

Pinking Lettuce

Teaching Ideas

This activity is a comprehension exercise which links with the learning objectives of testing common gases. The web-link provides further information and activities related to food science and careers.

Students could research to find out the composition of air and that of MAP products. This data could then be displayed in different ways such as tables, pie charts and bar charts.

Answers

Across

4. shelf life
5. oxidation
6. map
7. oxygen

Down

1. carbon dioxide
2. hydrogen
3. respiration

Activities

1. List the three ways that food and drink can spoil

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2. Describe what shelf life is.

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3. Explain why citric acid is added to some soft drinks.

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4. Suggest why yoghurt is not pasteurised after bacteria are added.

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5. Summarise the article as a tweet (no more than 140 characters can be used).

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Going further

If you want to find out more about a career as a food scientist visit www.chillededucation.org

