WHAT is the POP in POPCORN?

PRE LAB DISCUSSION

The corn grown for use as popcorn has to have a high moisture content and a tough seed coat. It is usually packaged and shipped in airtight containers. Bags of microwave popcorn are individually sealed in airtight packages.

During this experiment it is crucial that the popcorn is popped in the exact same way in each of the three parts, using the exact same amount of heat energy. If a microwave is available, it should be used. However, if a microwave is not available, students should use Bunsen burners and be sure to heat the corn for the same amount of time in each of the three parts of this experiment.

OBJECTIVE: To determine what causes some corn kernels to ***POP*** when heated.

CHEMICALS/EQUIPMENT: balance, Bunsen burner, flask, two hole stopper, ring, ring stand, screen, sharp probe, popcorn, cooking oil (not needed if a microwave is used), pan and oven or hot plate

PROCEDURE:

PART I

1. Determine the mass of 40 kernels of popcorn. Record.

2. Calculate the average mass of one kernel of popcorn.

3. Place the popcorn in a flask with a few drops of cooking oil. Stopper the flask with a two hole stopper.

4. Heat the flask and pop the corn, shaking it and being careful not to burn the corn.

5. Determine the number of popped kernels.

6. Determine the mass of the popped kernels.

7. Calculate the average mass of the popped kernels.

8. Calculate the percentage of kernels that popped.

PART II

1. Using a sharp probe, bore a small hole into each of 20 kernels of popcorn.

2. Place the corn in a flask, add a few drops of cooking oil, and stopper the flask with a two hole stopper.

3. Heat the flask to pop the corn, shaking it and being careful not to burn the corn.

4. Determine the number of kernels that popped.

5. Calculate the percentage of kernels that popped.

PART III

1. Place 40 kernels of popcorn in a pan and place in a warm oven [below 200^{o} F] or on a warm hot plate for 40 minutes.

2. Place the popcorn in a flask with a few drops of oil and stopper the flask with a two hole stopper.

3. Heat the flask to pop the corn, while shaking it and being careful not to burn the corn.

4. Determine the number of kernels that popped.

5. Calculate the percentage of the kernels that popped.

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DATA & CALCULATIONS

1. Mass of 40 kernels of popcorn.....

2. Calculated mass of one kernels of popcorn.....

3. Number of kernels that popped.....

4. Calculated mass of one popped kernel.....

5. Percentage of kernels popped in part I .....

6. Number of kernels popped in part II.....

7. Percentage of kernels popped in part II.....

8. Number of kernels popped in part III.....

9. Percentage of kernels popped in part III.....

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THINKING SCIENTIFICALLY

1. Why is popcorn usually sold in tightly sealed containers?

2. What caused the loss of mass when the kernels popped?

3. Why were the kernels with a hole in them less likely to pop?

4. Why were the kernels less likely to pop after they had been heated for 40 minutes?