LESSON 5

EXPLORING GAS LAWS

In this lab, we will delve into the practical applications of Boyle's law, Gay-Lussac's law, and Charles's law through a series of hands-on experiments. By observing how gases behave under different conditions, you will gain a deeper understanding of these different principles. Prepare to test your hypotheses and see these gas laws come to life with these simple experiments!

Supplies

- 50 mL Erlenmeyer flask
- Balloon
- Small marshmallow
- Tongs
- Graduated cylinder
- Hot plate
- 35 mL syringe (without a needle)
- Empty soda can
- Bowl of ice water
- Duct or masking tape

Instructions

1. Read through the instructions of this lab. For each experiment, record a hypothesis in the data table for what you think will happen based on your knowledge of the gas laws.

Part 1: Balloon & Flask

2. Use your graduated cylinder to measure about 10 mL of water and add to a 50 mL Erlenmeyer flask.
3. Place a balloon over the opening of the flask and place the flask on the hot plate until the water boils.
4. As soon as you observe the change in the balloon, carefully remove the flask from the hot plate so you don't get scalded with hot water!

5. Record your observations in the data table.

Part 2: Marshmallow & Syringe

6. Place a marshmallow in a syringe. Place your finger over the top of the syringe where the needle is usually placed.
7. Push and pull the syringe and observe what happens to the marshmallow.
8. Record your observations in the data table.

Part 3: Soda Can & Water

9. Use a graduated cylinder to measure 10 mL of water. Add the water to the bottom of an empty soda can.
10. Using a small piece of duct or masking tape, cover the hole of the can, leaving just a small slit through which steam can escape.
11. Place the soda can on the hot plate and heat until the water is boiling. You'll be able to see the steam coming out steadily from the top.
12. Using the tongs, quickly flip the can upside down into the bowl of ice water.
13. Record your observations in the data table.

Data Table

Experiment	Hypothesis	Observations	Variables involved (temperature, volume, pressure)	Gas law demonstrated
Balloon & flask				
Marshmallow & syringe				
Soda can & water				

Discussion Questions

1. For each experiment, use your knowledge of each of the laws to explain your observations of what happened.
2. Were your hypotheses correct for each experiment? Why or why not?