

Target Gas Law Lab Worksheet

In this lab you will count zinc atoms! In fact you will count out more zinc atoms than there are drops of water in Lake Michigan! And then you will take every zinc atom you've counted and carefully bond it with precisely two chlorine atoms! Be as precise as you can—your grade depends on it!

Safety Precautions

Hydrochloric acid solution is toxic by ingestion or inhalation; severely corrosive to skin and eyes. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron. Wash hands thoroughly with soap and water before leaving the laboratory. Follow all laboratory safety guidelines.

Procedure

1. Obtain a 250-mL beaker and write the beaker # above the Data Table.
2. Weigh the empty beaker on one of the balances. Record this mass in the Data Table.
3. Obtain a small sheet of zinc metal and holding the zinc over the beaker, use a pair of scissors to cut up the zinc into several long skinny strips (the skinnier the better). Allow these strips to drop into the beaker.
4. Weigh the beaker with the zinc pieces and record this mass.
5. Determine the mass of the zinc alone and record in the data table.
6. Use a graduated cylinder to measure out 25–30 mL of 3 M hydrochloric acid (HCl) solution, and then add the solution to the beaker. The Zn atoms will combine with the Cl atoms from the HCl in a 1:2 ratio to make the compound ZnCl_2 .
7. Observe the reaction. The ZnCl_2 is soluble in the water so you won't see it. Also, feel the bottom of the beaker. Record your observations (Questions 1 and 2).
8. While you wait about five minutes for the reaction to finish, start answering Questions 4–7 below.
9. After 5–6 minutes, observe the beaker. Record your observations (Question 3).
10. Once the reaction is complete, place the beaker on one of the hot plates in the fume hood. It will take about five more minutes for all the water to be boiled off. While waiting, continue working on the questions below.
11. Once the rapid boiling stops, the water should all be gone. Use beaker tongs to remove the beaker from the hot plate. There should be a crusty white residue around the sides of the beaker (that's some of the ZnCl_2) and there may be a very viscous liquid on the bottom. *Note:* Zinc chloride has a relatively low melting point—only 275°C !
12. Allow the beaker to cool for two minutes. When you are finished with Question 7 below, take this lab sheet and the beaker up to the instructor for the official weigh in! Your grade will be based on how close your prediction is to the actual mass according to the Scoring Table shown.
13. Rinse out your beaker into the sink and then dry it for the next class to use.

Data Table

Beaker # _____

Mass of beaker (g)	
Mass of beaker + zinc (g)	
Mass of zinc (g)	