

Weighing Moles Activity

Objective:

Become familiar with how to count extremely small particles by weighing.

Materials:

for each lab station with two to three students per station

- aluminum foil
- copper strips
- (3) labeled 600 mL beakers
 - 100 g ammonium sulfate $(\text{NH}_4)_2\text{SO}_4$
 - 500 g sodium chloride NaCl
 - 500 mL distilled water
- (2-3) plastic cups - sets of blue, clear, and red
- (2-3) Beral-type pipettes
- 500 mL distilled water
- (4-6) plastic spoons
- balance



Students should follow all safety protocols. Chemical splash goggles must be worn throughout this activity. Additionally, students should wear chemical-resistant gloves and a chemical-resistant apron. Upon completion of the activity, all materials should be disposed of properly and students should wash their hands thoroughly with soap and water.

Procedure:

1. Each student group should perform five tasks from one of the lists below. You will be graded on the accuracy of your results for each task.
2. As you complete each task, bring your chemical sample to your teacher to be checked. You will be allowed one “do-over” if you have made an error in your calculations.
3. Make sure to show your calculations in your lab notebook for each one of these five tasks.

Group #1:

1. Measure 1.25 moles of salt (NaCl) into a clear, dry cup.
2. Put 4.52×10^{24} molecules of water into a red, dry cup.
3. Get a sample of copper metal (#1) from your teacher and calculate the number of atoms it contains.
4. Give your teacher 6.13×10^{22} atoms of aluminum.
5. Measure 0.0485 moles of ammonium sulfate into a blue, dry cup.

Group #2:

1. Measure 1.35 moles of salt (NaCl) into a clear, dry cup.
2. Put 4.32×10^{24} molecules of water into a red, dry cup.
3. Get a sample of copper metal (#2) from your teacher and calculate the number of atoms it contains.
4. Give your teacher 6.69×10^{22} atoms of aluminum.
5. Measure 0.0472 moles of ammonium sulfate into a blue, dry cup.

Group #3:

1. Measure 1.51 moles of salt (NaCl) into a clear, dry cup.
2. Put 4.12×10^{24} molecules of water into a red, dry cup.
3. Get a sample of copper metal (#3) from your teacher and calculate the number of atoms it contains.
4. Give your teacher 6.86×10^{22} atoms of aluminum.
5. Measure 0.0468 moles of ammonium sulfate into a blue, dry cup.

More information supporting this activity can be found here:

<https://www.flinnsci.com/media/621446/91622.pdf>