

SEPARATION OF ELEMENTAL IRON IN CORN FLAKES (Honors)

This lab is to be neatly written up with a title, purpose, equipment, reagents, procedure, data table, all lab questions and a conclusion statement to be completed in your comp book.

- PURPOSE:** To observe and separate elemental Iron (Fe) contained in corn flakes
- EQUIPMENT:** Mortar and Pestle, Magnetic Stirring Plate, Magnet Stir Bar, 600 mL Beaker, Wash bottle, Stirring rod, Styrofoam cup, Electronic Balance, **Safety Goggles**
- REAGENTS:** Corn Flakes cereal, hot/boiling tap water

PROCEDURE:

- Find the number of grams per cup on the Cereal Box and record.
- Record the percentage of iron per serving noted on the box.
- Tare your Styrofoam cup and measure out exactly that number of grams as indicated per serving of cereal into your cup. Record the exact mass of the cereal you measured in your data table.
- Take the mass of your clean and dry stirring bar and record in your data table.
- Returning to your lab station, use the mortar and pestle, finely grind your cornflakes into a powdery consistence and transfer to the 600 mL beaker.
- Add *hot* water to raise the volume to approximately 400-500 mL. Place the magnetic stirring bar into the mixture and turn on the magnetic stirring plate. Turn the speed of the stirring up slowly until a nicely flowing stirring pattern is achieved. Stir for at least 20 minutes.
- Carefully retrieve the stir bar and rinse gently place it on a small piece of paper towel to remove the water. Reweigh the stir bar and record.
- Pour your remaining mixture from the 600 mL beaker through the sieve in one of containers provided at the end of the lab bench. *Do NOT pour cereal mixture into the sink.*
- Wash and return all lab equipment/materials to your station. Clean up and arrange your lab station exactly as you found it placing the stir bar back on the stirring plate and carefully discarding any cereal into the proper trash receptacle.

DATA TABLE: (Duplicate for inclusion in your comp book)

Cereal Brand	Box serving size-grams/cup	% iron per serving	Mass of Stir Bar (before)	Mass of Cereal	Mass of Stir Bar (after)
Observation: <i>(Describe anything you observed during this experiment)</i>					

LAB QUESTIONS: (Answer these questions in your comp book)

1. What type of mixture did you create in the 600 mL Beaker? *Homogeneous or heterogeneous?*
2. Explain how you identified this type of mixture?
3. What kind of separation did you perform in this experiment? *Physical or chemical separation?*
4. How did you know what type of separation it was?
5. What does the percentage of iron listed on the cereal box tell you? *(Be sure to carefully read the box information details including asterisks.)*
6. Is the iron in the cereal part of a compound or is it elemental iron?
7. Why don't we see or feel the iron when we eat it.
8. Will the cereal rust if it's left out long enough?
9. Were you able to isolate iron in your mixture? *(Explain in detail any indications that support your answer) If so, was it measurable?*
10. What does *dietary allowance or MDA* mean?
11. How much iron should we have in our diet daily?
12. How does our body break down this iron so that it can be used by our bodies or will it travel through the intestinal tract as if you swallowed a penny?

CALCULATIONS: Show all work including all labels and significant digits below. Box your answers.

1. If you were able to isolate iron in your sample, what percentage of iron did you find in your sample? To calculate this take the mass of iron isolated and divide by the mass of the cereal sample and multiply by 100%.
2. If a young adult requires 18 mg of Fe in their daily diet, did your 30.0 g sample provide this quantity?

CONCLUSION: Write a conclusion statement summarizing your findings.