

Determining Bonding Types Lab - IN LAB INSTRUCTIONS

How the presences of certain substances can effect the human body

Part 1: Modeling

It's important to understand what is happening at the atomic level when you are doing a lab. Think about what you already know about each type of compound and draw what you think is happening. Use a pencil so you can revise your drawing.

Once you have drawn your models, discuss them with a partner. Look back over the pre-lab pictures and see if you can gather more information from those pictures. Look in your notes or textbook to see if you can refine your drawing to be more accurate.

Draw an example of what you think an ionic compound looks like at an atomic level	Draw an example of what you think a covalent molecule looks like at an atomic level
To be completed in your lab notebook	

Final Drawings:

Draw an example of what you think an ionic compound looks like at an atomic level when added to water	Draw an example of what you think a covalent molecule looks like at an atomic level when added to water
To be completed in your lab notebook	

Part 2: Melting Point

Look back to your pre-lab and think about which type of substance has a low melting point, which has a very high melting point, then answer these questions (**in your lab notebook of course**) to help you better understand what is about to happen.

1. What kind of substance do you expect to melt first?
2. What kind of substance has a very high melting point?

Materials

Aluminum Foil or Boat	2 Unknown Substances	Tongs	Broken Circuit Bulb (for electrolyte testing)
Hot Plate	Scoopula	2 Stirring Rods	Distilled Water
6 Known Substances	2 Beakers		

Step	Procedure
1.	Take your lab bin to one of the tables with hotplates. Turn the hot plate to medium or "5"
2.	Create a foil boat with 4 sections or if given an aluminum boat, divide each aluminum boat into quarters by lightly embossing the bottom of the boat. *See example at the teacher lab bench if needed.
3.	Number each quarter in the corner (#1-8) *As shown in the diagram on the board in the front of the lab.
4.	Add about a ¼ tsp or small scoop (using scoopula) of each substance to the different sections of your foil boat. Substance 1 will go in section 1 of your boat. Substance 2 in section 2 and so on. Carefully wipe the scopula off after each use to be sure no contamination occurs but do not use any water. Do not allow substances to touch.

	Have three lab group members take their phone stopwatch out to time the substances melting point. You will have three member do this to reduce any issues of error in your data collection. DO NOT TAKE YOUR EYES OFF THE SUBSTANCES!
5.	Place your aluminum or foil boat on the hotplate to allow your substances to melt. If they are not melting you can turn the hot plate up by one and wait, then another if needed.
6.	When the first substance melts, have the fourth lab group member (the one with a stopwatch) record in data table in their lab notebook structured like the example data table below. Continue to record as each substance melts.
7.	After completing the data for each substance, you may toss the boats in the trash. Nothing is toxic.

Data Table Part 2: Melting Points				
Substance Formulas & Names	Qualitative Observations About the Solid Substance	Melting Time (sec) & Order (1-8)	Ionic or Covalent?	Reasoning
Substance 1 Formula: _____ Name: _____				
Substance 2 Formula: _____ Name: _____				
Substance 3 Formula: _____ Name: _____				
Substance 4 Formula: _____ Name: _____				
Substance 5 Formula: _____ Name: _____				
Substance 6 Formula: _____ Name: _____				
Substance 7 Formula: _____ Name: _____				
Substance 8 Formula: _____ Name: _____				

To be completed in your lab notebook

Part 3: Solubility and Conductivity in Water

Solubility: In the pre-lab you read that an ionic compound is very easily dissolved in water because the ions are attracted to the polar (like the opposite poles of a magnet) water molecules and the compound will dissociate, or break apart, as it dissolves. Polar covalent molecules are also fairly soluble because they are attracted to the water, although polar covalent substances do not break apart as they dissolve. Non-polar covalent molecules are not soluble in water because they are not attracted to the polarity of water, and they will either sink or float depending on their density.

Conductivity: Look back at your pre-lab and think about which type of substance will conduct electricity.

Do you expect different results for each of the three substances? Which types of substances may have the same results? **-answer in your lab notebook of course :) I will stop reminding you soon!**

Step	Procedure
1	After cleaning up your station, take your lab bin to one of the stations near the front of the room (near the teacher bench.)
2	Fill in the formula and name of each substance, including the unknown ID into your data table.
3	Into one of the beakers, place a pea size amount of your first substance. Fill that same beaker to the 20mL mark with distilled water.
4.	Write down your observations. Do you see any solid remaining? Do you see any liquid layers?
5.	If the substance is fully dissolved, write SOLUBLE If the substance is not dissolved, write INSOLUBLE
6	Now test from conductivity using the broken circuit bulb. Be sure to rinse the probes with a few squats of water into the waste beaker before testing each substance. Record in your data table.
7	Rinse beaker in sink and dry.
8.	Repeat for remaining substances being sure to keep your substances in order!!!

Data Table Part 3: Solubility & Conductivity in water					
Substance Formulas & Names	Qualitative Observations	Soluble (Y/N)	Conductive (Y/N)	Ionic or Covalent?	Reasoning for identification
Substance 1 Formula: ----- Name: -----					
Substance 2 Formula: ----- Name: -----					
Substance 3 Formula: ----- Name: -----					

To be completed in your lab notebook

<u>Substance 4</u> Formula: ----- Name: -----					
<u>Substance 5</u> Formula: ----- Name: -----					
<u>Substance 6</u> Formula: ----- Name: -----					
<u>Substance 7</u> Formula: ----- Name: -----					
<u>Substance 8</u> Formula: ----- Name: -----					
<u>Unknown 1</u>					
<u>Unknown 2</u>					

To be completed in your lab notebook

Resources & References

References:

<http://health.howstuffworks.com/wellness/diet-fitness/information/question565.htm>
<http://www.livestrong.com/article/268996-symptoms-of-low-potassium-of-electrolytes/>
 Images: http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_21c/natural_environment/hydrosphererev2.shtml
http://www.utdallas.edu/~brikowi/Teaching/Field_Methods/Lab_3_Background.html
<http://zube.brinkster.net/SCH3U21/Reactions/Reading/stateparticles.jpg>
<http://webspace.ship.edu/cgboer/theneuron.html>
<http://www.bem.fi/book/03/03.htm>
<http://clevelandcliniclabs.com/assets/pdfs/brochures/career-spotlight-phlebotomist.pdf>