

This lab will give us varied practice making and understanding solutions.



**PART 1 - Making solutions of specific Molarities - from scratch, and from dilution.**

**1. Make 40.0 mL of a 0.75 M solution of copper (II) chloride from scratch.**

Using the MOLARITY FORMULA, determine how many grams of  $\text{CuCl}_2(\text{s})$  are needed.

Show your work to the teacher before making this solution. Mix ingredients in a small beaker as carefully as you can. Pour most of the water into the beaker, then use an eye dropper it exactly to the proper volume. Stir with glass stirring rod.

Fill one of the small test tubes HALF WAY with this solution.

**2. Using what you just made as stock, prepare 20.0 mL of 0.35 M  $\text{CuCl}_2(\text{AQ})$**

First do the math and show the teacher your calculations before you make this solution.

Use a small graduated cylinder and a new SMALL clean dry beaker.

Fill one of the small test tubes HALF WAY with this second solution.

**3. Using the 0.35 M solution, prepare 10.0 mL of 0.11 M  $\text{CuCl}_2(\text{AQ})$  solution.**

Measure the new stock into a graduated cylinder, then fill to the 10.0 mL mark.

Fill one of the small test tubes HALF WAY with this third solution.

4. Show the teacher your 3 test tubes before you clean up.

5. Wash all glassware with soap and water, and put all glassware upside down.

## PART 2 - PUTTING THIS ALL TOGETHER.

Mark each box with an I or M, a P or NP, or a yes or a no. Work LEFT TO RIGHT!

NOTE: All ionic compounds are polar (why? Ask)

compound	Is this an IONIC or MOLECULAR compound?	Is this a POLAR or NONPOLAR compound?	Will this compound dissolve into water? Yes or no	Will this compound ionize into the water? Yes or no	Will it be an electrolytic solution?
$\text{CaCl}_2$					
$\text{CH}_3\text{Br}$					
$\text{CCl}_4$					
$\text{CH}_3\text{OH}$					
$\text{Al}(\text{NO}_3)_3$					
$\text{CHCl}_3$					
$\text{N}_2$					
$\text{CH}_4$					
$\text{BaSO}_4$					
$\text{NaCl}$					
$\text{PbBr}_2$					

**Word Problems - on loose leaf paper, which of course is CHEAP!  
Please write complete sentences, as neatly as you can. Space is great.**

1. To make a solution from scratch, what formula must you start with?
2. If you have a stock solution on hand and need to make a weaker solution from it, what formula do you use?
3. Explain how to prepare 346.0 mL of 2.18 M NaCl<sub>(AQ)</sub>? (a diagram and math in your answer please)
4. CO<sub>2</sub> is a nonpolar molecule. If you try to blow CO<sub>2</sub> bubbles into water, you can't carbonate it. Explain in one sentence how Wegmans gets the carbonation into the seltzer?
5. In one more sentence explain why it is nearly impossible NOT TO BURP if you chug a cold seltzer or soda.
6. What 3 ways can you increase the rate of dissolving of most solutes into solvents?
7. What would a test tube of water feel like to your hand if you dissolved in some NH<sub>4</sub>Cl into it? If you don't know, then go look in table I. (DO NOT GUESS)
8. If two bears, one in northern Alaska and one in northern New York fall into rivers at the same time, only one of them will dissolve. Which one would dissolve, and why?
9. On the large set of boxes on the previous page, only 3 of those compounds are electrolytes. Assuming they all form similar sized 1.00 M solutions, of the three, which is the best electrolyte, which is the worst?
10. Does pressure affect the solubility of carbon dioxide in water? Does pressure affect NaCl<sub>(S)</sub> in water?
11. Give two examples of a dilute and a concentrated solution.
12. Draw a small 3-inch sized graph titled, Solubility of CO<sub>2</sub> as a Function of Temp. Draw the best fit line.
13. Skip this one.
14. Give an example of two liquids that are miscible, and then an example of two liquids that are immiscible.
15. Name 3 things to do that would speed up the rate of dissolving solutes into solvents.
16. Of the 3 solutions you made, which has the highest PPM, which the lowest? Explain how you know without even doing any math. In fact, don't do any math unless you have to. You don't really.

This lab requires	This material for	These points
Cover page	Excellent title, and a single sentence that describes the lab objective.	1 + 1 = 2
Page 2 of handout	The Big Set of Boxes	10
Page 3 of handout	14 Questions above (#8 is just for fun)	28
Lab due on: _____		40 points