

LAB: MOLES, IONS & ATOMS, AND FORMULA UNITS & MOLECULES

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

- 1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety,
- 7) Procedures/Observations, and 8) Data (collect data in your notebooks)

The last 2 pages need to be printed out. These pages will be turned in. Data for this lab should be collected in your notebooks and used to calculate the answers in the Calculations section. The calculations and final answers (Data Table A) will be due one week after performing the lab in class (your next lab class).

Measure the mass of a 100mL beaker and record in your notebooks. One level spoon of sodium chloride (NaCl) should be added to the beaker. Measure and record the total mass of the beaker and sodium chloride. Return the sodium chloride and remove any remaining crystals from the beaker with a paper towel.

Repeat the procedures above using sucrose ($C_{12}H_{22}O_{11}$). One level spoon of sucrose should be added to the beaker and record this total mass in your notebooks. Return the sucrose and remove any remaining crystals from the beaker with a paper towel.

Repeat the procedures above using water (H_2O). One level spoon of water should be added to the beaker and record this total mass in your notebooks. The water may then be discarded in the sink.

Complete the calculations, showing all work, units, and proper significant figures used.

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CALCULATIONS: (show all work and make it organized, if I can't read it, then it is wrong)

1. For each substance, do the following calculations and enter the results in the DATA TABLE A:

a. Calculate the mass of the substance in each sample. (empty beaker, beaker & substance, substance alone)

b. Calculate the Molar Mass of each substance. Show work.

c. Use the answers to (a) and (b) calculate the number of moles of each of the samples.

d. Use the answers to (c) to calculate the number of moles of each element in each of the samples.

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- e. Use the answers to (d) to calculate the number of ions or atoms of each element in each of the samples.

DATA TABLE A: (answers only)

sample formula	(a) sample mass	(b) molar mass	(c) moles in sample	(d) moles of elements	(e) number of ions or atoms
NaCl				Na:	Na:
				Cl:	Cl:
C ₁₂ H ₂₂ O ₁₁				C:	C:
				H:	H:
				O:	O:
H ₂ O				H:	H:
				O:	O:

- 2: In 1982, because of the high price of copper, the United States began to mint a new penny. Now what appears to be a solid copper coin is actually a shell of copper surrounding a core of zinc. Zinc makes up 97.6 percent of the total mass of one of these new pennies. Find the total mass of a new penny and calculate the number of atoms of zinc in your coin. Indicate the date of your coin and show all of your measurements and work.

3. Calculate the mass, in grams, of one atom of _____ . Show all work.
(Teacher will give you the element in class)