thLAB: Comparing Moles

Objective

Calculate and compare the number of moles that are in a teaspoon of salt and a teaspoon of sugar.

Materials

1 teaspoon of salt

1 teaspoon of sugar (not sugar substitute – ask if you need some!)

Simple homemade balance (from the activity, "Building Your Balance")

Procedure

1. Re-assemble your simple balance. Make sure that the balance is on a flat table with both cups over a table.
2. When balanced, the ruler may not be perfectly level, but you will be able to tell that tapping it can cause it to sway to either side. When the ruler is not balanced, it will only sway to one side. You should check the empty balance point before each time you use it and make adjustments as necessary.
3. Place a teaspoon of salt in one of the cups, then use the syringe to fill the other cup with water until you have a balance. Record in your data table the beginning and ending volumes in the syringe.
4. Find the mass of the salt and record your results in your data table. *(Remember that the density of water is 1.0 g/ml. That means that 1 ml of water has a mass of 1 g.)*
5. Repeat the procedures above to find the mass of a teaspoon of sugar. Record your results in your data table.

Data Table

	Salt - NaCl	**Sugar - $C_{12}H_{22}O_{11}$**
Syringe beginning volume		
Syringe ending volume		
Volume of water added		
Mass of one teaspoon		
Molar mass		
Moles in one teaspoon		

Calculations

1. Using the formulas for salt (NaCl) and sugar ($C_{12}H_{22}O_{11}$), calculate how many moles of each were in the packets. Scan your handwritten work and answers. Also record you answers in the Data Table.

Conclusion

Write your own conclusion to this lab. Even though you had a teaspoon of both substances, which had more moles in it – salt or sugar? Explain how this could be since they were both one teaspoon.

Questions

1. How many grams of sugar would it take to make the same number of moles as the salt? Show proper calculations to support your answer.
2. Which is more dense, salt or sugar? Explain.