

Experimental Procedures

Part 1: Preparing solutions

Solution 1

1. Weigh an empty 25 mL volumetric flask and record the mass in your datasheet to the precision of your instrument
2. Label 3 empty 100 mL beakers (#1, #2 & #3), weigh and record mass of beaker #1 and #2 in your datasheet to the precision of your instrument.
3. Weigh approx 1.5 g sodium nitrate and add to the 25 mL volumetric flask.
4. Weigh the flask plus solid solute and record the mass in your data sheet under solution #1 to the precision of your instrument
5. Carefully add water to the volumetric flask so the bottom of the meniscus lines up with the calibration mark. Try to do this without dissolving all the salt (ie., you want a heterogenous mixture with undissolved solid salt in the presence of water). Use an eye dropper for the last few drops
6. Cover the top of the volumetric flask with a cover or Parafilm and swirl and invert several times until all the solid is dissolved.
7. Look at the meniscus and record in your data sheet your observation in the data sheet.
8. Using an eyedropper add additional water until the meniscus aligns with the calibration mark
9. Weigh the volumetric flask with dissolved salt and record the mass in your datasheet to the precision of your instrument
10. Pour the solution from the volumetric flask into the 100 mL beaker labeled #1 and set aside. You will use it in part 2.
11. Clean the volumetric flask with DI water

Solution 2

1. Weigh approx 4.5 g sodium nitrate and add to the clean volumetric flask from step 10 above
2. Weigh the volumetric flask plus solid solute and record the mass in your data sheet under solution #2 to the precision of your instrument
3. Carefully add water until the flask is 2/3rd full (no fluid is going up the neck)
4. Swirl the flask until all the solid is dissolved.
5. Place your hand on the flask and write on the data sheet if the process is endothermic or exothermic
6. Once all the solute is dissolved, dilute to volume, using an eyedropper for the last few drops.
7. Weigh the volumetric flask with dissolved salt and record the mass under solution 2 in your datasheet to the precision of your instrument
8. Pour the solution from the volumetric flask into the 100 mL beaker labeled # 2. You will use it in part 2.

Part 2: Freezing point determination

1. Obtain a Vernier LabQuest, hook up the temperature probe and set it to "meter" with the scale reading in °C. Instructions for running the LabQuest are in the Instrumentation section of your lab manual
2. Using a clean volumetric flask pour 25 mL of pure water into the 100 mL beaker labeled #3
3. Place temperature probe into pure water
4. Add around 20 mL of fresh crushed ice to a 50 mL beaker.
5. Quickly add the ice to the 100 mL beaker, gently swirl the temperature probe and record the temperature just as the last bit of ice melts.
6. Using fresh ice repeat steps 3 & 4 for the two salt solutions, and record the temperatures as the last bit of ice melts. Try to use identical amounts of ice for each iteration.
7. Weigh the mass of each beaker with the solution and melted ice. Record on your datasheet to the precision of the instrument
8. Pour the pure water down the sink and pour the sodium nitrate solutions into a waste jar, and it will be recovered for a future class.