

UNSATURATED, SATURATED & SUPERSATURATED LAB Name: _____ partner: _____

Follow the procedure below, and record all observations. Ignore the letters in ().

1) Obtain a clean, unscratched test tube. Using a pipet, add 2.0 mL of water (A). Then add 4.00 g of $\text{NaC}_2\text{H}_3\text{O}_2$ ("sodium acetate," which we will abbreviate **SA** from here on), but don't shake yet (B). Use a perm. pen to mark the top of the undissolved **SA** level on the side of test tube. Stopper and mix for 3 sec, tilt to get any undissolved crystals off the sides, and note any changes (C).

Observations: _____



2) Re-mark the top of the undissolved solute level. Mix for another 5 sec and observe the changes, including feeling the test tube (D).

Observations: _____

3) Repeat step #2 until no more change occurs (E).

Observations: _____

4) REMOVE STOPPER! Heat test tube (by placing in hot water) for 90 sec (while waiting, weigh out another 0.10 g of **SA** for step #5). Remove test tube from heat, stopper & mix for 10 sec (F).

Observations: _____

5) While still hot, add the 0.10 additional grams of **SA**, stopper & mix for 10 sec (G)

Observations: _____

6) Add an additional 4.00 g of **SA**, stopper & mix for 10 sec (H).

Observations: _____

7) REMOVE STOPPER! Heat for 2 min (while waiting, weigh out 1.00 g of **SA** for step #8), then remove from heat, stopper and mix for 10 sec (I). Observations: _____

8) Add the 1.00 g of **SA** & mix (J). Observations: _____

9) Reheat until all crystals have dissolved (K), stopper and mix, and then cool in cold water for 50-60 sec (L), (*If recrystallization occurs during cooling, reheat to redissolve it, then re-cool it.*)

* Then add 1 crystal **SA** & observe (M). Observations: _____

10) (bonus) Reheat until all crystals have dissolved and then an additional 30 sec (N), make sure your test tube rim is ULTRA-clean, and cool in water for 50-60 sec (O). Place a crystal or two on a clean petri dish lid. Then, carefully, drop-by-drop, pour your solution out onto the crystal. Observe what happens (P). Advice: Don't allow the growing pillar to come too close to the mouth of the test tube... (The tallest pillars will receive bonus!)

Observations: _____

11) Clean up your lab area and equipment, leave it the way you found it, and place your final product in the sodium acetate recovery container. **don't forget to answer questions on back...**

QUESTIONS:

1. Consider each of the points throughout the procedure indicated by the letters (A-P) and decide whether at each particular moment, the test tube contained a solution that was unsat, sat. or supersat. **Briefly justify your answers.** *The first one is done for you.*

A	unsat	it's pure water... there is no solute in it.	I	_____
B	_____	_____	J	_____
C	_____	_____	K	_____
D	_____	_____	L	_____
E	_____	_____	M	_____
F	_____	_____	N	_____
G	_____	_____	O	_____
H	_____	_____	P	_____

2. If you were handed a solution and told to determine whether it was unsaturated, saturated or supersaturated, explain what you would do and what you would expect to see for each of three possible cases: (*hint- think of the demo we did in class*)

unsaturated: _____

saturated: _____

supersaturated: _____

3. A solution has some undissolved crystals sitting on the bottom. Could it be...

unsaturated? Y / N Explain: _____

saturated? Y / N Explain: _____

supersat.? Y / N Explain: _____

4. Use the solubility curves on Worksheet 7.3 to explain precisely, step-by-step, how you would go about making a **supersaturated** KNO_3 solution. State precisely how many grams of water, how many grams of KNO_3 and what temperatures you would use.