ROSEDALE ACADEMY

SCH3U – Solubility Investigation

Instructions: Using the Salts & Solubility Simulator (https://phet.colorado.edu/en/simulation/legacy/soluble-salts) you will explore the concept of solubility and the factors that affect it.

Section 1: Table Salt

Trial 1: Table Salt in Water

1. Click on the "Table Salt" tab at the top of the simulator.
2. Click on the salt shaker and shake it up and down 25 times:

Describe, in detail, what happens to the salt particles as they enter the water?

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Explain this observation to the best of your ability?

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Trial 2: Reduced Water Volume

1. Click the "Reset All" button
2. Click on the faucet in the lower left corner of the simulator to drain the water from the tank. Drain the water until there is only 1.0×10^{-23} L.
3. Click on the salt shaker and drag it up and down 25 times.

Describe in detail what happens to the particles of salt when they enter the water:

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Explain your observations to the best of your ability (compare the results to the first trial):

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Trial 3: Increased Water Volume

1. Click on the faucet in the upper left corner of the simulator to add water. Add water until there is $3.0x10^{-23}$ L

Describe in detail what happens to the particles of salt when the volume of water is increased.

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Explain your observations to the best of your ability:

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Part 2: Design a Salt

For this part of the investigation, you will explore different ratios of +ve (cation) and –ve (anion) charges to see how this effects the solubility of a salt.

Instructions:

1. Click on the "Design a Salt" tab at the top of the simulator.
2. Set the "Cation Charge" to +1 and the "Anion Charge" to -1
3. Click and shake the salt shaker up and down 20 to 25 times.

Trial 1. Cation charge: +1 Anion charge: -1
Observations:_____
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4. Try several different ratios of cation to anion of your own choosing (i.e. (+3 : -1); (+2 : -8) ; (+3 : - 3). Click reset all after each trial.
5. Record your observations for each ratio below, making sure to record the ratio that you used for each trial.

Trial 2. Cation charge:_____ Anion charge:_____
Observations:_____
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Trial 3. Cation charge:_____ Anion charge:_____
Observations:_____
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Trial 4. Cation charge:_____ Anion charge:_____
Observations:_____
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Trial 5. Cation charge:_____ Anion charge:_____
Observations:_____
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Trial 6. Cation charge:_____ Anion charge:_____

Observations:_____

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Based on your observations of different anion to cation ratios, what conclusions can you make relating the ratio of charges in a salt to its ability to dissolve in water?

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