Concentration PhET Weblab Part 2 – Use HTML 5

https://phet.colorado.edu/sims/html/concentration/latest/concentration_en.html

Part 2: Saturation - Procedure

1. Drain the tank. Choose the dropper solution for Cobalt (II) Nitrate  and fill the tank to 0.50 L (L).

   The solution is almost saturated. Add a little bit more solid solute with the shaker  until you reach the saturation for Cobalt (II) Nitrate. In Data Table 2, record the "Concentration at Saturation Point (mol/L or M)".
2. Shake in extra solute until you see the solid particles settling on the bottom and answer Part 2-Question #1.
3. Click Remove Solute and repeat with each solute using 0.50 L (1/2 L) every time skipping the Drink Mix.

Part 2-Analysis:

1. Calculate the moles of solute required to saturate the solution using the molarity formula and record your result in Analysis Table 2. Show work for Cobalt(II) Nitrate only below:

   mol=(molarity)(vol of solvt)

   mol=(5.64m)(0.50L)=2.8mols
2. Calculate the grams of solute required to saturate the solution using the molar mass and record your results in Analysis Table 2. Show work for Cobalt (II) Nitrate below & answer Part 2 - Questions # 2.

   $2.8\text{mol } Co(NO_3)_2 \left| \frac{182.95\text{g } Co(NO_3)_2}{1\text{mol } Co(NO_3)_2} \right. = 510\text{g } Co(NO_3)_2$

DATA TABLE 2		ANALYSIS TABLE 2	
Solute	**Concentration at Saturation Point (mol/L or M)**	**Moles required to saturate solution (mol)**	**Grams required to saturate solution (g)**
Cobalt (II) nitrate	5.640	2.8	510
Cobalt chloride	4.320	4.3	560
Potassium dichromate	0.510	0.76	76
Potassium chromate	3.350	1.7	330
Nickel (II) chloride	5.210	2.6	340
Copper sulfate	1.380	0.69	110
Potassium permanganate	0.480	0.24	38

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Part 2-Questions: Explain Using Complete Sentences

1. Once the solution saturated, the added solid solute does not dissociate. What does the excess do?

   The excess settles on the bottom

2. Using 0.50 L of solution each time, does the solubility of the solutes seem similar?

   The solubilities are different because it's a unique characteristic of the solute.

3. How could you "supersaturate" these solutions, exceeding the amount of dissolved solute possible for a given volume of solvent by preventing formula units from precipitating into crystals?

   Heat while almost saturated then saturate and cool slowly.