name:
Read the BASICS. Study or read chem for 15 minutes every day practice.

1. How much $\mathrm{NaNO}_{3}$ will saturate a $100 . \mathrm{mL}$ solution at $20^{\circ} \mathrm{C}$ ? $\qquad$
2. How much $\mathrm{NaNO}_{3}$ will saturated a 325 mL solution at $20^{\circ} \mathrm{C}$ ? (show work).
$20^{\circ} \mathrm{C} \frac{\mathrm{NaNO}_{3}}{\text { water }} \frac{\text { grams }}{100 \mathrm{~mL}}=\frac{\text { grams }}{325 \mathrm{~mL}}$
3. If you cooled a 100 mL saturated $\mathrm{KCl}_{(\mathrm{AQ})}$ from $80^{\circ} \mathrm{C}$ to $10^{\circ} \mathrm{C}$, how many grams of solute precipitates?
4. Once this excess solute precipitates out of solution in question \#3, forms a dynamic equilibrium. Define dynamic equilibrium.
5. In solutions chem, there's an expression: Like Dissolves Like. What does that refer to?
6. Which solution contains more solute?
$200 \mathrm{~mL} \mathrm{HCl}_{(\mathrm{AQ})}$ at $30^{\circ} \mathrm{C}$, or 100 mL of $\mathrm{KI}_{(\mathrm{AQ})}$ at $20^{\circ} \mathrm{C}$ ? Don't guess, show the math.
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7. You mix a 100 mL saturated solution of potassium chloride at $10^{\circ} \mathrm{C}$.

What is the molarity of this solution?
2. You dissolve 4.48 moles of KCl into 12.00 liters of water. What is the molarity of this solution?
3. You dissolve 7.86 moles of $\mathrm{KNO}_{3}$ into 21.0 liters of water, what is the molarity of this solution?
4. You put 1.12 grams of perfume into your bathtub to scent the water. Your tub holds this 158 liters of water and perfume. Each liter is 1000 grams. How many parts per million of perfume are in this water?
5. A "normal" saline is $\mathrm{NaCl}_{(\mathrm{AQ})}$ solution that you get via an IV line in the hospital if you are dehydrated. There are 4.5 grams NaCl per 500 mL bag of solution. That matches the same salt concentration in your body. What's the molarity of this solution?
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1. You put 50.0 grams $\mathrm{KClO}_{3}$ into 475 mL of water at $100.0^{\circ} \mathrm{C}$. How many more grams will it take to saturate this solution?
2. A 100 mL saturated $\mathrm{KClO}_{3(\mathrm{AQ})}$ is chilled from $100^{\circ} \mathrm{C}$ to $80^{\circ} \mathrm{C}$.

How many grams of $\mathrm{KClO}_{3(\mathrm{~s})}$ precipitates out of solution?
3. If you have a stock solution of $2.75 \mathrm{M} \mathrm{Ca}(\mathrm{OH})_{2(\mathrm{AQ})}$ how do you prepare a 1.43 M solution of 550 mL ? (show FORUMULA + work, then draw a picture of a flask like the one top right)
4. If you have a stock $3.64 \mathrm{M} \mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2(\mathrm{AQ})}$ how do you prepare a 0.755 M solution of 305 mL ? (show FORUMULA + work, draw a picture of the flask)
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1. How many parts per million of arsenic oxide be present in a water tank of 253,800 liters that contains 1.15 kg of arsenic oxide dissolved into this?
2. What is the concentration of $\mathrm{O}_{2(\mathrm{G})}$ in parts per million, in a solution that contains 0.008 grams of $\mathrm{O}_{2}$ dissolved into each 1000. grams of $\mathrm{H}_{2} \mathrm{O}_{(\mathrm{L})}$ ? (from the NYS Regents Jan 2008, \#38)
3. What is the concentration in parts per million of $\mathrm{CO}_{2(\mathrm{AQ})}$ in soda, if the soda contains 0.0035 grams $\mathrm{CO}_{2}$ per can? Each can of soda contains 355 grams of soda.
4. The 3 colligative properties of water are given in this table. List the correct values for water, then ESTIMATE them for a salty water solution of $4.75 \mathrm{M} \mathrm{Mn}\left(\mathrm{NO}_{3}\right)_{7(\mathrm{AQ})}$ (very salty)
Round to a whole number value. Say manganese (VII) nitrate solution.

|  | pure water | $\left.4.75 \mathrm{M} \mathrm{Mn}^{2} \mathrm{NO}_{3}\right)_{7(\mathrm{AQ})}$ |
| :---: | :---: | :---: |
| boiling point <br> in Kelvin |  |  |
| freezing point <br> in Kelvin |  |  |
| vapor pressure <br> at room temp |  |  |

