

Practice for Solutions and Water - You should be able to do ALL of these problems. Work with a partner or two, use a calculator, write formulas, watch SF, and find the answers online at Arbuiso.com on the SOLUTIONS page. This is great practice for the celebration and the regents exam.

1. How many grams of ammonia (NH_3) saturate a 100 mL solution at 90°C ?
2. How many grams of ammonia (NH_3) saturate a 575 mL solution at 90°C ?
3. If you start with a 100 mL saturated solution of KClO_3 at 100°C and cool it rapidly to 25°C , how many grams of solute fall out as a precipitate?
4. If you start with a 364 mL saturated solution of KClO_3 at 100°C and cool it rapidly to 25°C , how many grams of solute fall out as a precipitate?
5. Explain the dynamic equilibrium that occurs in question 4.
6. A 100 mL saturated solution of sodium acetate contains approximately 169 grams at 100°C . If you create a 20°C saturated solution of sodium acetate it is saturated with just 123 grams of sodium acetate. If you start with the hot solution, and cool it, all 169 grams remain aqueous at 20°C , how is this possible?
7. Tell what the expression “when bonds form, energy is released” means. Refer to ionic bonds and also to hydrogen bonds in your explanation.
8. What is the molarity of a sodium nitrate solution that contains 34.8 grams in 425 mL of solution?
9. If you have a 2.25 M $\text{NaCl}_{(\text{AQ})}$ of 1550 mL, how many grams of NaCl are present?
10. If a solution is 3.50 M and contains 671 grams of HCl, what volume is this solution?
11. If your stock solution is 8.65 M NaOH, how would you mix up a solution of 3.45 M and 225 mL $\text{NaOH}_{(\text{AQ})}$?
12. What is the boiling point of a 3.75 M $\text{KCl}_{(\text{AQ})}$ solution of one liter volume?
(the BP elevation is 0.50 K/mole particles per liter)
13. Skip this one
14. What is the freezing point of a 3.75 M $\text{KCl}_{(\text{AQ})}$ solution of one liter volume?
(the FP depression is 1.86 K/mole particles per liter)
15. Why does this KCl solution conduct electricity?
16. Does solid KCl conduct electricity? If not, why not. If yes, how?
17. Does MELTED, or molten KCl conduct electricity?
18. Can you make up a 50.0 mL 5.00 M KCl using this 3.75 M $\text{KCl}_{(\text{AQ})}$ solution? How, or why not?
19. Which cup would evaporate faster in a room, a 400. mL cup of pure water or a 400. mL cup of 1.00 M $\text{NaCl}_{(\text{AQ})}$?
20. What does “like dissolves like” mean? Water is polar, name two molecular compounds that would dissolve into water, and two more that would not dissolve into water.
21. If a hot tub of 425 liters has a level of 7.50 PPM of sugar (a silly teenager melted some candy in it), how many grams of sugar are in this tub?
22. Draw six water molecules that surround these 2 ions that are floating in an aqueous solution. Make sure that the water molecules “orient” properly.

