Dilutions worksheet cavalcade 2002

Continue

1. Your teacher needs to make a 0.500 M solution of HCl from concentrated 12.0 M HCl. If the volume of the dilute needs to be 500 mL, then how many mL of the concentrated does he need to mix with how much water? (Remember the final total volume is 500 mL).

2. It is necessary to make a 0.500 M solution of HCl from 500.0 mL of a 3.00 M solution of HCl. What is the volume of the new solution?

3. What is the molarity of a solution which has a volume of 1500.0 mL if it was obtained by diluting 250.0 mL of a 6.0 M solution of H_2SO_4 ?

4. Your teacher needs to make 500.0 mL of a 3.00 M solution of H_2SO_4. Concentrated H_2SO_4 from the chemical company is 18.0 M. How many mL of the concentrated acid is needed to dilute with how much water to make this solution ? (It should be noted that Sulfuric acid gives off tremendous heat as it is diluted. The dilution needs to be done in an ice bath because the heat released is so great that the beaker can shatter.) The old saying for diluting acids is..."You know you really oughter add the acid to the water".

Name _____   Date _____ Period _____

Solutions, Solvation and Reading a Solubility Curve

For Questions 1-13, use the solubility chart

1. Which of the salts shown on the graph is the least soluble in water at 10°C? _____
2. Which of the salts shown on the graph has the greatest increase in solubility as the temperature increases from 30 degrees to 60 degrees?
3. Which of the salts has its solubility affected the least by a change in temperature?
4. At 20°C, a saturated solution of sodium nitrate contains 88 grams of solute in 100 ml of water. How many grams of sodium nitrate must be added to saturate the solution at 50°C?
5. At what temperature do saturated solutions of potassium nitrate and sodium nitrate contain the same weight of solute per 100 mL of water?
6. What two salts have the same degree of solubility at approximately 19°C?
7. How many grams of potassium chloride must be added to 1 liter (1,000 mL) of water to produce a saturated solution at 50°C?
8. A saturated solution of potassium nitrate is prepared at 60°C using 100 mL of water. How many grams of solute will precipitate out of solution if the temperature is suddenly cooled to 30°C?
9. What is the average rate of increase for the solubility of KNO_3, in grams per 100 mL, per degree Celsius in the temperature range of 50°C to 70°C?
10. If 50 mL of water that is saturated with $KClO_3$ at 25°C is slowly evaporated to dryness, how many grams of the dry salt would be recovered?
11. Thirty grams of KCl are dissolved in 100 mL of water at 45°C. How many additional grams of KCl are needed to make the solution saturated at 60°C?
12. What is the smallest volume of water, in mL, required to completely dissolve 39 grams of KNO_3 at 19°C?
13. What is the lowest temperature at which 30 grams of KCl can be dissolved in 100 mL of water?

14. Are the following solutions **saturated**, **unsaturated** or **supersaturated** (assume that all three could form supersaturated solutions)
   a. 45 g of KCl in 100 mL of water at 90°C _____
   b. 126 g of KNO_3 in 100 mL of water at 60°C _____
   c. 95 g of $NaNO_3$ in 100 mL of water at 10°C _____
15. Assume that a solubility curve for a gas such as Oxygen, at one atmosphere of pressure, was plotted on the solubility curve graph. Reading from left to right, would this curve would: slope upwards, slope downwards or remain constant _____

For the rest of the questions, use your textbook notes on solutions:
16. Draw a picture of a water molecule (H_2O). Label the H's and O. Label the positive end and the negative end.


IN-CLASS PROBLEMS – SEPARATION SCIENCE
CHROMATOGRAPHY UNIT

Thomas Wenzel, Bates College

In-class Problem Set – Extraction

1. Devise a way to separate the materials in the following sample by performing an extraction.

The sample consists of water with a complex mixture of trace levels of organic compounds. The compounds can be grouped into broad categories of organic acids, organic bases and neutral organics. The desire is to have three solutions at the end, each in methylene chloride, one of which contains only the organic acids, the second contains only the organic bases, the third contains only the neutrals.

    Remember – Ions are more soluble in water than in organic solvents.

        – Neutrals are more soluble in organic solvents than in water.

2. Devise a way to solubilize the organic anion shown below in the organic solvent of a two-phase system in which the second phase is water. As a first step in this problem, show what might happen to this compound when added to such a two-phase system.
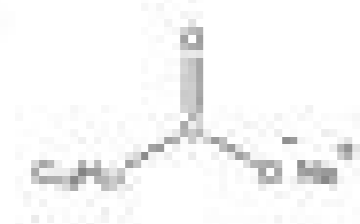
Solutions & Dilutions Worksheet
Show all work on loose-leaf or notebook

1) If I add 25 mL of water to 125 mL of a 0.15 M NaOH solution, what will the molarity of the diluted solution be?

2) If I add water to 100 mL of a 0.15 M NaOH solution until the final volume is 150 mL, what will the molarity of the diluted solution be?

3) How much 0.05 M HCl solution can be made by diluting 250 mL of 10 M HCl?

4) I have 345 mL of a 1.5 M NaCl solution. If I boil the water until the volume of

5) How much water would I need to add to 500 mL of a 2.4 M KCl solution to make a 1.0 M solution?

6) Explain how you would make 450 mL of a 0.250 M NaOH solution.

7) To what volume will you have to dilute 30.0 mL of a 12 M HCl solution to make a 0.35 M HCl solution?

8) How many grams of calcium chloride will be needed to make 750 mL of a 0.100 M CaCl₂ solution?

9) Explain why this experimental procedure is incorrect: To make 1.00 L of a 1.00 M NaCl solution, I will dissolve 58.5 grams of sodium chloride in 1.00 L of water.

10) How many grams of beryllium chloride are needed to make 125 mL of a 0.050 M solution?

11) How many grams of beryllium chloride would you need to add to 125 mL of water to make a 0.050 molal solution?

12) The density of ethanol is 0.789 g/mL. How many grams of ethanol should be mixed with 225 mL of water to make a 4.5% (v/v) mixture?

13) Explain how to make at least one liter of a 1.25 molal ammonium hydroxide solution.

14) What is the molarity of a solution in which 0.45 grams of sodium nitrate are dissolved in 265 mL of solution.

15) What will the volume of a 0.50 M solution be if it contains 25 grams of calcium hydroxide?

16) How many grams of ammonia are present in 5.0 L of a 0.050 M solution?

CM (%)	MI (%)	CA		POL	END
		Gaps	Breaks		
0 (water)	2.3	1	0	0	0
4	2.4	2	0	0	0
8	2.2	2	1	0	0
12	2.2	3	0	1	0

For abbreviations, see legend to Table 1.

Dilution is the process of decreasing the concentration of a solute in a solution, usually simply by mixing with more solvent like adding more water to the solution. To dilute a solution means to add ... 2 days ago chemistryland.com First realize that the solute (substance dissolved) is the same amount in both the stronger solution and after it is diluted.A problem always gives the concentration and volume of either the diluted solution or the stronger solution.Start your dimensional analysis with those two knowns (the given concentration and its volume) 1. First realize that the solute (substance dissolved) is the same amount in both the stronger solution and after it is diluted. 2. A problem always gives the concentration and volume of either the diluted solution or the stronger solution. 3. Start your dimensional analysis with those two knowns (the given concentration and its volume) 448 Show detail 2 weeks ago chemteam.info Problem #1: If you dilute 175 mL of a 1.6 M solution of LiCl to 1.0 L, determine the new concentration of the solution. Solution: M 1 V 1 = M 2 V 2 (1.6 mol/L) (175 mL) = (x) (1000 mL) x = 0.28 M. Note that 1000 mL was used rather than 1.0 L. Remember to keep the volume units consistent. › Problems #11 - 25 Dilution Problems #11 - 25. Ten Examples Problems #1 - 10 Problems #26 - 35 ... › Ten Examples moles solute before dilution = moles solute after dilution. Let us now write the ... 472 Show detail 1 week ago youtube.com Nov 27, 2011 · This is a chemistry tutorial that covers dilution problems, including examples of how to calculate the new concentration of a diluted solution, and how to ca... 98 Show detail 1 week ago study.com Molar Concentration. The most common measure of concentration in a chemistry laboratory is molarityor molar concentration. It is the number of moles of solute that are dissolved in a liter of solution. Its units are $\rm \frac{mol (solute)}{L (solution)}$, and its symbol is M. The Dilution Equation.Whenever a solution is diluted by... 250 Show detail 1 week ago dadeschools.net Placing the proper values into the dilution equation gives: (2.500 mol/L) (100.0 mL) = (0.5500 mol/L) (x) x = 454.5 mL. Sometimes the problem might ask how much more water must be added. In this last case, the answer is 454.5 - 100.0 = 354.5 mL. Go ahead and answer the question, if your teacher asks it, but it is bad technique in the › File Size: 63KB › Page Count: 2 483 Show detail 1 day ago study.com Compute the dilution factor from the concentrated solution to the dilute solution. 26. A chemistry laboratory technician requires a 0.180 molar $\rm Ca (OH)_2$ solution in an experiment ... 236 Show detail 2 days ago khanacademy.org Oct 23, 2020 · This process is known as dilution. We can relate the concentrations and volumes before and after a dilution using the following equation: $M_1V_1 = M_2V_2$ where M_1 and V_1 represent the molarity and volume of the initial concentrated solution and M_2 and V_2 represent the molarity and volume of the final diluted solution. 238 Show detail 1 week ago chemistryland.com Dilution Problems.

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