

Universal solvent = water

Key

Dilutions (answer on losseleaf)

1. You have 125 ml of a 96% solution. You want to dilute it to a 15% solution. How much diluted solution do you need?

$$(0.96)(125) = 0.15(x)$$

$$x = 800 \text{ mL}$$

2. You have 1.5 L of a 35% solution. You want to dilute it and have 3 L of the solution. What is the concentration of the diluted solution?

$$1.5(0.35) = 3x \rightarrow = 17.5\%$$

$$x = 0.175$$

3. You have 500 ml of a 14 g/L solution. You want to have 900 ml of the solution. What is the concentration of the diluted solution?

$$14(0.5) = 0.9x$$

$$x = 7.778 \text{ g/L}$$

4. You have 4L of a 22 g/L solution. You want to have 300 ml of the solution. What is the concentration of the diluted solution?

$$4(22) = 0.3x$$

$$x = 293.3 \text{ g/L}$$

5. You have 200 ml of a 10 g/L solution. You want to dilute it to 3 g/L. Give a procedure you would use to make the dilution.

$$0.2(10) = 3(x)$$

$$x = 0.667$$

$22 = \frac{x}{4}$ (1) 200 mL stock solution

(2) add 0.667 of solvent

(3) mix

6. You have 800 mL of a 16% solution. You want to dilute it to a 2% solution. What is the volume of the diluted solution?

$$800(0.16) = 0.02x$$

$$6400 \text{ mL}$$

7. You have 4 L of an 85% solution. You want to dilute it to a 45% solution. What is the volume of the diluted solution?

$$4(85) = 0.45x$$

$$x = 7.56 \text{ L}$$

8. You have 300 mL of a 5 g/L solution. You need to prepare 5 L of a diluted solution. What is the concentration of the diluted solution?

$$0.3(5) = 5x$$

$$x = 0.3 \text{ g/L}$$

9. You have 1500 ml of a 20% solution. You want to dilute it and have a 7% solution. Explain the procedure you would use to make the dilution.

$$0.2(1500) = 0.07x$$

$$4285.71 \text{ mL}$$

10. You have 300 ml of a 5 g/L solution. You need to prepare 5 L of a diluted solution. What is the concentration of the diluted solution?

$$0.3(5) = 5x$$

$$x = 0.3 \text{ g/L}$$

11. You have 1500 ml of a 7 g/L solution. You want to dilute it and have a 2 g/L solution. Explain the procedure you would use to make the dilution

$$1.5(7) = 2x$$

$$x = 5.25 \text{ L}$$

12. Describe a situation where you might want to dilute the concentration of the solution.

Too much hot chocolate powder in your cup that it is super saturated, therefore you would add more water.

Key

Name: _____

Date: _____

Homework: Dilution

Answer the following questions, which will be graded for marks (SHOW ALL YOUR WORK):

1. A bottle of cleaner is a ^{C_1} 10g/L solution, but to clean the counter you only need 100 mL of a ^{C_2} 2g/L solution. What volume of cleaner should you use?

$$V_2 = \frac{C_1}{C_2} \times V_1$$

$$10x = \frac{0.1(2)}{10}$$

$$x = 0.02 \text{ L}$$

2. Juice concentrate is a ^{C_1} 200 g/L solution of orange juice. 1050 mL of water is added to a 350 mL can of concentrate.

- a) What is the volume of the new solution? $1050 \text{ mL} + 350 \text{ mL} = 1400 \text{ mL}$
 b) What is the concentration of the new solution?

$$(200)(0.35) = X(1.400)$$

$$C_2 = 50 \text{ g/L}$$

3. Fragrance is sold in two different concentrations. Perfume is a 0.25 g/L solution of fragrance and alcohol, while Eau de cologne is a 0.05 g/L solution of fragrance and alcohol. You can make Eau de cologne by diluting Perfume. What volume of Eau de cologne can be made from a 15 mL bottle of Perfume?

$$(0.25)(0.015) = 0.05 X$$

$$X = 0.075 \text{ g/L}$$

4. 50 mL of a 400 g/L antiseptic solution is diluted with 150 mL of water. What is the concentration of the new solution?

$$(400)(0.05) = X(0.2)$$

$$X = 100 \text{ g/L}$$

Name: _____

Date: _____

Practice Stencil: Solubility

1. Solute or solvent?

- a) The substance present in smaller quantities in a solution Solute
- b) The substance present in larger quantities in a solution Solvent
- c) Substance which dissolves another substance Solvent
- d) The substance that dissolves Solute

2. What is solubility? What unit do we use to measure solubility?
Name two factors that can change the solubility of a substance.

It is a physical characteristic property that defines the maximum amount of solute that can be dissolved in a given amount of solvent.
It is measured as a rate g/L or g/mL. Temperature & pressure affect solubility.

3. The solubility of sugar is 179.2 g/100 mL. What does this mean?
What will happen if we try to dissolve more sugar in 100 mL of water?

The maximum amount of sugar that can be dissolved in 100mL of water is 179.2g. If we try and dissolve more it will just turn to a sediment at the bottom of the mixture.

4. True or false?

- a) In general, the colder a substance is, the more capable of dissolving a solute it is. F
- b) If we leave a solution of sugar and water in the fridge, sugar will crystallize out of solution and fall to the bottom of the glass T

↳ Because temp drops : particle movement drops so solubility drops.

5. What is the solubility of a substance that can dissolve up to 75 g in 225 mL of water at 0°C? Show your work.

$$\frac{75}{225} = \frac{1}{3} = 0.3\bar{3} \text{ g/mL}$$

6. Name 3 factors that influence the rate of dissolution and explain each one.

Crushing the solute → increases surface area of contact w/ solvent

Agitation: Makes molecules move faster leaving more space between so the solute & solvent molecules come into contact more quickly

heating: particles have more energy: collide more.