Chemistry CP Name:_____
Chapter 14 Test

In your own words define the following: (2 points each)

1. Aqueous Solution:
2. Concentrated Solution:
3. Dilute Solution:
4. Dilution:
5. Mass Percent:
6. Molarity
7. Saturated solution
8. Solute
9. Solution
10. Solvent
11. Standard Solution:
12. supersaturated solution
13. unsaturated solution
14. volumetric flask
15. Add acid to water, NOT water to acid
16. How does a solid substance dissolve in water? (3 pts)
17. What is meant by the expression “LIKE DISSOLVES LIKE”? (3 POINTS)

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Solve the following problems. (6 points each)

18. If there are 41.2 grams of $CaCl_2$ in 250 grams of solution, what is the percent by mass of $CaCl_2$ in the solution?

19. If I dissolve 26 grams of $CuSO_4$ in 350 grams of water, what is the percent by mass of $CuSO_4$ in the final solution?

20. How many grams of a 17.4% sodium chloride solution would I need to have 375 grams of sodium chloride?

21. If I have 59.3 grams of a solution that is 10.5% by mass potassium iodide, how many grams of potassium iodide do I have?

22. What is the molarity of my solution if I dissolve 1.35 moles of sodium chloride in enough water to make 2.5 liters of solution?

23. If I have 23.4 mL of a 1.5 M solution of calcium chloride (molar mass = 111. grams/mol), how many grams of calcium carbonate do I have?

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24. If I use 14.06 grams of $CaCl_2$ (molar mass = 111 grams/mol) to make a 0.35 M solution how many mL of solution did I make?

25. If I have 0.45 liters of a 2 M solution of $AgNO_3$, how many moles of solute do I have?

26. If I dilute 45 ml of a 12.0 M solution of HCl to a volume of 1500 mL, what is my final concentration?

27. If I have a standard stock solution that is 14 M, how many mL of my stock solution would I need to make 1.5 liters of a 0.575 M solution?

28. **Explain how** to create 500 mL of a 2.5 M HCl solution if you only have 12 M HCl available. Remember to include the proper order for adding your substances and include any special equipment that you should use. (6 points)

29. How many mL of a 0.15 M sulfuric acid solution would I need to add to 25 ml of a 4.5 M solution of sodium hydroxide to neutralize it before disposal. The equation for the reaction is: $2\ NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2HOH$ (6 points)

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30. If there are 55.7grams of NaCl in 588 grams of salt solution, what is the percent by mass of NaCl in the solution?

31. If I dissolve 3.8 grams of silver nitrate in 250 grams of water, what is the percent by mass of silver nitrate in the final solution?

32. How many grams of a 47.6% sodium hydroxide solution would I need to have 20 grams of sodium hydroxide?

33. If I have 2.5 grams of a solution that is 1.55% by mass sugar, how many grams of sugar do I have?

34. What is the molarity of my solution if I dissolve 0.35 moles of glucose in enough water to make 1.2 liters of solution?

35. If I have 300 mL of a 1.5 M solution of $CuCl_2$ (molar mass = 134.45 grams/mol), how many grams of $CuCl_2$ do I have?

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36. If I use 21.2 grams of $CuCl_2$ (molar mass = 134.445grams/mol) to make 0.65 M solution how many mL of solution did I make?

37. If I have 2.5 liters of a 10.4 M solution of $NaNO_3$, how many moles of solute do I have?

38. If I dilute 230 ml of a 4.5 M solution of HCl with 500 mL of water, what is my final concentration?

39. If I have a standard stock solution that is 2.55 M, how many mL of my stock solution would I need to make 1.25 liters of a 0.5 M solution?

40. **Explain how** to create 250 mL of a 1.5 M NaCl solution if you only have solid NaCl (molar mass 58.44 g/mol) available. Remember to include the proper order for adding your substances and include any special equipment that you should use. (6 points)

41. How many mL of a 1.75 M Sodium sulfate solution would I need to add to 15 ml of a 6.05 M solution of barium nitrate in order for it to react completely. The equation for the reaction is: $Ba(NO_3)_2 + 2\ Na_2SO_4 \rightarrow NaNO_3 + BaSO_4$. (6 points)