Solutions Worksheet

1. What would be the percent concentration of each of the following solutions?
   a. 54.0 g of AgNO₃ is dissolved in 128 g of water.
   b. 4.22 g of K₂CO₃ is dissolved in 426 mL of water.
   c. 0.762 g of ZnF₂ is dissolved in 1.30 liters of water.

2. What weight of solute is needed to produce each of the indicated solutions?
   a. 500.0 g of a 6.40% NaCl solution.
   b. 136 g of a 14.2% LiNO₃ solution.
   c. 42.2 g of a 7.60% AgNO₃ solution.

3. How many grams of water should be used in each of the problems in "2" above.

4. How many grams of the following solutes would you need to prepare the indicated volume and concentration of the solutions given?
   a. 340. mL of a 1.82 M aluminum nitrate solution.
   b. 25.0 mL of a 4.26 M potassium cyanide solution.
   c. 370. mL of a 0.00674 M ammonium sulfate solution.

5. What should the final volume(mL) of each solution be so that the amount of solute dissolved will produce the indicated concentration.
   a. 2.86 g of copper(I) carbonate to produce a 0.640 M solution.
   b. 12.62 g of calcium hydrogen carbonate to produce a 1.28 M solution.
   c. 54.26 g of sodium oxide to produce a 0.430 M solution.

6. What will be the final concentration of a solution prepared by dissolving the indicated solute in enough water to produce the indicated volume of solution?
   a. 15.4 g of strontium acetate filled up to 340. mL.
   b. 176.2 g of iron(III) sulfite filled up to 1.42 liters.
   c. 3.22 g of copper(I) chlorate filled up to 40.0 liters.

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7. What will be the final concentration of the solution indicated that will result from the following dilutions?
   a. 14.0 mL of a 4.20 M Na₂CO₃ solution is diluted to 86.0 mL.
   b. 450. mL of a 1.22 M HCl solution is diluted to 1.26 liters.

8. To what volume should the indicated solution be diluted to produce a solution of the desired concentration?
   a. 12.0 mL of a 0.64 M KCl solution to produce a 0.19 M solution.
   b. 84.2 mL of a 4.60 M KMnO₄ solution to produce a 1.42 M solution.

9. What volume of the indicated solution is needed to produce the volume and concentration of a diluted solution as indicated?
   a. 2.73 M NaOH solution to prepare 142 mL of a 0.540 M solution.
   b. 0.0076 M SnF₂ solution to prepare 25.0 mL of a 0.00027 M solution.

1 lb. = 454 g    1 qt. = 946 mL    4 quarts = 1 gallon    density of water = 1g/mL

Solutions

1. 2. 3.
   a. 29.7%     a. 32.0 g NaCl    a. 468 g H₂O
   b. 0.981%    b. 19.3 g LiNO₃   b. 117 g H₂O
   c. 0.0586%   c. 3.21 g AgNO₃   c. 39.0 g H₂O

4. 5. 6.
   a. 132 g Al(NO₃)₃   a. 23.9 mL    a. 0.220 M
   b. 6.93 g KCN     b. 60.8 mL    b. 0.353 M
   c. 0.329 g (NH₄)₂SO₄ c. 2.040 mL  c. 5.48 x 10⁻⁴ M

7. 8. 9.
   a. 0.684 M     a. 40. mL     a. 28.1 mL
   b. 0.436 M     b. 273 mL     b. 0.89 mL