

1) Calculate the mass percent of each of the following solutions:

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| a) 1.50g of KCl and 100.0 g water | c) 0.20 mol $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ and 125 g of water |
| b) 2.50 g of Na_3PO_4 and 10.0 g of water | d) 1.50 mol NaOH in 33.0 mol of water |

2) Calculate the mass percent of each of the following solutions:

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| a) 25.0 g NaNO_3 and 125.0 g water | c) 0.75 mol K_2CrO_4 and 255 g water |
| b) 1.25 g CaCl_2 and 35.0 g water | d) 1.20 mol H_2SO_4 and 72.5 mol water |

3) A chemistry lab experiment requires 25.2 g of silver nitrate. How many grams of a 15.5% by mass solution of silver nitrate should be used?

4) A reaction requires 25.0 g of sodium chloride. How many grams of a 10.0% solution would provide this amount of solute?

5) In 25.0 g of a 7.50% by mass solution of CaSO_4 :

- how many grams of solute are present?
- how many grams of solvent are present?

6) In 75.0 g of a 12.0% by mass solution of BaCl_2 :

- how many grams of solute are present?
- how many grams of solvent are present?

7) What is the volume percent of 10.0 mL of CH_3OH dissolved in water to a volume of 40.0 mL?

8) What is the volume percent of 2.0 mL of hexane dissolved in benzene to a total volume of 9.0 mL?

9) Perform the following calculations:

- what mass of a 41.77% iron (III) perbromate solution contains 56.01 g of solute?
- how much water needs to be added to 3.55 g of cobalt (III) chloride to make an 18.0% solution?
- how many kg of sodium chloride needs to be added to 475 kg of water to make a 9.0% sodium chloride solution?
- a 25.00% potassium sulfate solution contains 11.11 g of solute. What is the mass of the solution?
- you need to make 125 g of a 7.50% solution of nickel (II) acetate. What mass of solute needs to be added to water to make this solution?
- you have a 16.11% ammonium carbonate solution that contains 3.88 g of solute. What is the mass of the solution?
- you need to make a 22.5% solution that contains 45.5g of silver nitrate. What VOLUME of water ($d = 1.00 \text{ g/mL}$) needs to be used to make the solution?

10) Calculate the molarity of the following solutions:

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| a) 0.25 mol of solute in 75.0 mL of solution | c) 35.0 g of sodium acetate in 1.25 L of solution |
| b) 1.75 mol of KBr in 0.75 L of solution | d) 75 g of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ in 1.0 L of solution |

11) Calculate the molarity of the following solutions:

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|---|---|
| a) 0.50 moles of solute in 125 mL of solution | c) 275 g $\text{C}_6\text{H}_{12}\text{O}_6$ in 775 mL of solution |
| b) 2.25 mol CaCl_2 in 1.50 L of solution | d) 125 g of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ in 2.50 L of solution |

12) How many moles of solute are in each of the following solutions?

- 1.5 L of 1.20 M sulfuric acid
- 25.0 mL of 0.0015 M barium chloride
- 125 mL of 0.35 M potassium phosphate

13) How many moles of solute are in each of the following solutions?

- 0.75 L of 1.50 M nitric acid
- 10.0 mL of 0.75 M sodium chlorate
- 175 mL of 0.50 M LiBr

14) How many grams of solute are in each of the following solutions?

- a) 2.5 L of 0.75 *M* potassium chromate
- b) 75.2 mL of 0.050 *M* acetic acid
- c) 250 mL of 16 *M* nitric acid

15) How many grams of solute are in each of the following solutions?

- a) 1.20 L of 18 *M* sulfuric acid
- b) 27.5 mL of 1.50 *M* potassium permanganate
- c) 120 mL of 0.025 *M* iron (III) sulfate

16) How many mL of 0.750 *M* phosphoric acid will contain the following?

- a) 0.15 mol of phosphoric acid
- b) 35.5 g of phosphoric acid

17) How many mL of 0.250 *M* ammonium sulfate will contain the following?

- a) 0.85 mol of ammonium sulfate
- b) 25.2 g of ammonium sulfate
- c) 16.8 g of ammonium ion

18) What will be the molarity of the resulting solutions made by mixing the following? Assume the volumes are additive.

- a) 125 mL of 5.00 *M* perchloric acid with 775 mL of water
- b) 425 mL of 0.250 *M* lithium arsenate with 750. mL of water
- c) 175 mL of 3.0 *M* rubidium oxalate with 275 mL of water
- d) 350. mL of 0.130 *M* antimony (III) nitrate with 150.0 mL of water
- e) 2.11 L of 0.950 *M* chromic acid with 2.50 L of water
- f) 50.0 mL of 0.250 *M* hypoiodous acid with 40.0 mL of 0.333 *M* hypoiodous acid