

Name: \_\_\_\_\_

Section: \_\_\_\_\_

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## Workshop 13 – Solution Concentrations

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Show calculation setups and answers for all problems below.

1. What is the percent composition by mass of a solution made by dissolving 25.0 g of sodium phosphate,  $\text{Na}_3\text{PO}_4$ , in 50.0 g of water?

$\text{Na}_3\text{PO}_4$  \_\_\_\_\_

$\text{H}_2\text{O}$  \_\_\_\_\_

2. How many moles of magnesium hydroxide,  $\text{Mg}(\text{OH})_2$  are required to prepare 2.50 L of a 0.350 M solution?

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3. Determine the molarity of a solution if 2.75 g of potassium hydroxide,  $\text{KOH}$ , are dissolved in water to make 250. mL of solution.

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4. How many milliliters of a 0.250 M solution can be prepared by dissolving 4.00 g of  $\text{NaCl}$  in water?

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5. How many grams of lithium bromide,  $\text{LiBr}$ , could be recovered by evaporating 550. mL of 20.0 percent  $\text{LiBr}$  solution to dryness ( $d = 1.34 \text{ g/mL}$ )?

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6. How many milliliters of 6.0 M HCl is needed to prepare 500. mL of a 0.150 M HCl solution?

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7. A sample of potassium hydrogen phthalate,  $\text{KHC}_8\text{H}_4\text{O}_4$ , weighing 0.512 g was dissolved in water and titrated with 24.82 mL of an NaOH solution. Calculate the molarity of the NaOH solution.

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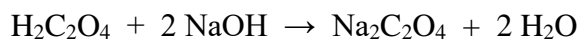
8. How many grams of hydrogen nitrate are in 75. mL of concentrated (18 M)  $\text{HNO}_3$  solution?

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9. A sulfuric acid solution has a density of 1.49 g/mL and contains 32 percent  $\text{H}_2\text{SO}_4$  by mass. What is the molarity of this solution?

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10. Oxalic acid reacts with sodium hydroxide according to the following equation:



A 25.00 mL sample of the  $\text{H}_2\text{C}_2\text{O}_4$  solution required 19.62 mL of 0.341 M NaOH for neutralization. Calculate the molarity of the acid.

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