

Please round your answers to two decimal places, when applicable.

1. A student prepares 5 liters of salt water with 2 moles of salt (NaCl). Calculate the molarity of this solution.

0.4 M

2. A 300 mL NaNO₃ solution contains 0.073 mol of NaNO₃. Calculate the molarity of this solution.

0.24 M

3. If 10.0 g NaNO₃ are dissolved in a 0.5 L solution, then what is the molarity of this solution? 85g/mol

0.24 M

4. There are 3.4 mol of AgNO₃ dissolved in a 2.0 L solution. Calculate the molarity.

1.7 M

5. What is the concentration, in molarity, of an 800 mL solution which contains 2.6 mol of C₆H₁₂O₆?

3.25 M

6. What is the concentration, in molarity, of a 750 mL solution which contains 750 g of C₁₂H₂₂O₁₁?

342.34g/mol

2.92 M

7. What is the concentration, in molarity, of a 1200 mL solution which contains 50.0 g NaCl?

$$\frac{58.44 \text{ g/mol}}{}$$

$$0.71 \text{ M}$$

8. What is the concentration, in molarity, of a 500 mL solution which contains 100.0 g NaOH?

$$40 \text{ g/mol}$$

$$5 \text{ M}$$

9. What is the concentration, in molarity, of a 6000 mL solution which contains 2000 g AgCl?

$$143.32 \text{ g/mol}$$

$$2.33 \text{ M}$$

10. What is the concentration, in molarity, of a 60 mL solution which contains 23 g NaCl?

$$58.44 \text{ g/mol}$$

$$6.56 \text{ M}$$

11. What is the volume of a 2.5 M sample of $\text{AgNO}_3(\text{aq})$ if it contains 0.3 mol AgNO_3 ?

$$0.12 \text{ L or } 120 \text{ mL}$$

12. What is the volume of a 5 M sample of $\text{NaOH}(\text{aq})$ if it contains 2.2 mol NaOH ?

$$0.44 \text{ L or } 440 \text{ mL}$$

13. What is the volume of a 2.5 M sample of $\text{CaBr}_2(\text{aq})$ if it contains 100 g CaBr_2 ?

$$199.88 \text{ g/mol}$$

$$0.2 \text{ L or } 200 \text{ mL}$$

14. What is the volume of a 0.45 M sample of AlPO_4 if it contains 200 g AlPO_4 ?

$$\frac{200 \text{ g}}{121.95 \text{ g/mol}}$$

3.64 L

15. What is the volume of a 0.80 M sample of CaSO_4 if it contains 50 g CaSO_4 ?

$$\frac{50 \text{ g}}{136.14 \text{ g/mol}}$$

0.46 L or 460 mL

16. How many moles of AgNO_3 are present in 4 L of a 3 M AgNO_3 solution?

12 mol

17. How many moles of CaI_2 are present in 200 mL of a 2 M CaI_2 solution?

0.40 mol

18. How many grams of AgNO_3 are present in 2.0 L of a 3 M AgNO_3 solution?

$$\frac{6 \text{ mol} \times 169.88 \text{ g/mol}}$$

1019.28 g

19. How many grams of NaOH are present in 700 mL of a 2.5 M NaOH solution?

$$\frac{1.75 \text{ mol} \times 40 \text{ g/mol}}$$

70 g

20. What mass of $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ is present in a 300 mL sample of 4 M $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{aq})$?

$$\frac{1.2 \text{ mol} \times 342.34 \text{ g/mol}}$$

410.81 g

$$M = \frac{\text{mol}}{L}$$

$$2 = \frac{6}{3}$$

21. For each solution below, fill in the missing blanks. You may use the remainder of the page for scrap paper.

Solution	Concentration	Mass Solute Present	Number of Moles of Solute Present	Volume of Solution (mL)	Volume of Solution (L)
NaOH	2.5 M	50g	1.25 mol	500 mL	0.5 L
NaCl	4.0 M	500 g	8.56 mol	2140 mL	2.14 L
NaNO ₃	3.0 M	153g	1.8 mol	600 mL	0.6 L
C ₁₂ H ₂₂ O ₁₁	3.25 M	500 g	1.46 mol	450 mL	0.45 L
C ₆ H ₁₂ O ₆	1.33 M	600 g	3.33 mol	2500 mL	2.5 L
AgNO ₃	2 M	713.5 g	4.2 mol	2100 mL	2.1 L
CH ₃ COOH	2.6 M	624.62g	10.4 mol	4000 mL	4.0 L
Al ₂ (Cr ₂ O ₇) ₃	0.11 M	15.44g	0.022 mol	200 mL	0.2 L
HgI	4.40 M	72 g	0.22 mol	50 mL	0.05 L
Fe ₂ O ₃	1.75 M	100 g	0.63 mol	360 mL	0.36 L

22. Given the following three solutions:

199.88 g/mol

Solution no. 1: 4 g of CaBr_2 in 200 mL of solution;

Solution no. 2: 4 mol of CaBr_2 in 20 L of solution;

Solution no. 3: 20 g of CaBr_2 in 2 L of solution.

Which solution has the highest concentration of CaBr_2 ?

Your answer must include the formula or formulas used and all of the calculations, including a clear indication of the units of measure.

Sol # 1 0.100 M

Sol # 2 0.2 M

Sol # 3 0.05 M



Answer: Solution no. 2

23. Given the following three solutions:

$$149.89 \text{ g/mol}$$

Solution no. 1: 40 g of NaI in 0.4 L of solution;

Solution no. 2: 0.3 mol of NaI in 500 mL of solution;

Solution no. 3: 0.2 kg of NaI in ~~1 L~~ of solution.

$$\cancel{2020 \text{ mL}} \quad 2022 \text{ mL}$$

Which solution has the highest concentration of NaI?

Your answer must include the formula or formulas used and all of the calculations, including a clear indication of the units of measure.

$$\text{Sol \# 1 : } 0.67 \text{ M}$$

$$\text{Sol \# 2 : } 0.6 \text{ M}$$

$$\text{Sol \# 3 : } \cancel{1.33} \text{ M} \\ 0.66 \text{ M}$$

$$0.6 \text{ M} = \frac{0.3 \text{ mol}}{x}$$

$$\cancel{0.66} = \frac{1.3343 \text{ mol}}{x \text{ L}}$$

Answer : Solution no. 1