

1. Calculate the molarity: 22.615 g AgClO_4 in 250 mL solution. [mass to moles to M].
2. Calculate osmolality: 16.49 g NaCl in 500 mL water. [mass to moles x #particles to M].
3. Calculate #moles: 50.0 mL of 0.40 M KBr . [volume to #moles].
4. Calculate molarity: 10.0 mL 2.50 M NaOH is diluted to a final volume of 500 mL. [$MV = MV$].
5. Calculate mass (g): 20.0 mL of 0.427 M HNO_3 solution. [#moles (MV) to mass].
6. Calculate molarity: 36.09 g NaCl in 500 mL solution. [mass to moles to M].
7. Calculate molarity: The solution in #6 is diluted, 10 mL to 250 mL. [dilution factor].
8. What volume of 0.100 M acetic acid is required to give 0.024 moles?
9. Balanced equation: $\text{Al}(\text{OH})_3 + 3 \text{HCl} \rightarrow \text{AlCl}_3 + 3 \text{HOH}$. What volume of 0.200 M HCl is needed to completely react with 16.47 g $\text{Al}(\text{OH})_3$? [mass to moles to moles to volume].
10. $3\text{CuCl}_2 + 2\text{Al} \rightarrow 3\text{Cu} + 2\text{AlCl}_3$; How many grams of Al are needed to completely react with 100 mL of 0.200 M CuCl_2 ? [$M(\text{CuCl}_2)$ to moles(CuCl_2) to moles Al to mass Al].

11. How would you prepare 500 mL of a 0.20 M solution of sucrose ($C_{12}H_{22}O_{11}$, mol wt 342.3) using a balance (0.01 g) and a 500.0 mL volumetric flask?
12. What is the molar concentration of a solution made up by dissolving 20.05 g $MgSO_4$ in enough water to give a final volume of 250 mL?
13. What is the osmolality of a solution made up by dissolving 40.27 g of $MgSO_4$ in 500 g water? [mass to moles times #particles to osmolality].
14. How many moles of HCl are contained in 50 mL of a 0.127 M solution? [MV = moles].
15. 10.00 mL of an aqueous solution of HNO_3 is exactly neutralized by 23.21 mL of 0.25 M NaOH. What is the molar concentration of HNO_3 ? [Balanced equation?].
16. Which solution would be subjected to the greater osmotic pressure vs. water: 0.40 M NaCl or 0.30 M $BaCl_2$?
17. 100 mL of 2.00 M HCl is diluted to 250 mL. What is the concentration of the new solution?
18. 5.28 g $Ba(OH)_2$ is dissolved in enough water to give 500 mL solution. What is the molar concentration of hydroxide ion in the solution?
19. 50 mL of 0.100 M NaCl is mixed with 250 mL of 0.25 M NaCl. How many grams of NaCl are contained in the new solution?
20. $2HNO_3 + Ba(OH)_2 \rightarrow Ba(NO_3)_2 + 2HOH$; 10.0 g $Ba(OH)_2$ reacts exactly with how many mL of 0.5M HNO_3 ? [moles $Ba(OH)_2$ to moles HNO_3 to volume HNO_3].