

IWS 1 (10 points)

Easy Level (0.1 points each * 15 problems = 1.5 points total)

1. Calculate the concentration of NaCl in a solution if 5 g of NaCl is dissolved in 500 mL of water.
 2. Find the molarity of a solution made by dissolving 10 g of KNO₃ in 250 mL of water.
 3. What is the molarity of a 1 L solution containing 0.5 moles of HCl?
 4. A solution contains 0.2 moles of glucose in 1 L of water. Calculate its concentration.
 5. Calculate the ionic strength of a 0.1 M NaCl solution.
 6. Find the ionic strength of a 0.2 M KBr solution.
 7. Determine the ionic strength of a 0.05 M MgCl₂ solution.
 8. Calculate the ionic strength of a 0.1 M Ca(NO₃)₂ solution.
 9. What is the ionic strength of a 0.01 M Na₂SO₄ solution?
 10. What is the volume of a solution needed to dissolve 5 g of NaOH to make a 0.5 M solution?
 11. Calculate the amount of water required to dilute 2 L of a 1 M solution of HCl to a 0.5 M solution.
 12. How much water should be added to 500 mL of a 2 M NaCl solution to obtain a 1 M solution?
 13. What is the volume of solution needed to dissolve 10 g of KCl to make a 0.2 M solution?
 14. Calculate the final volume of solution when 1 L of 3 M solution is diluted to a 1 M solution.
 15. How much 0.5 M solution can be made by dissolving 25 g of Na₂SO₄ in water?
-

Medium Level (0.3 points each * 15 problems = 4.5 points total)

16. Determine the concentration of a solution formed by mixing 100 mL of 0.5 M HCl with 200 mL of 0.25 M NaOH.
 17. A solution is made by dissolving 50 g of Na₂CO₃ in 300 mL of water. What is its concentration?
 18. Find the molarity of a solution when 75 g of CaCl₂ is dissolved in 500 mL of water.
 19. Calculate the concentration of a solution prepared by mixing 50 mL of 0.2 M HNO₃ with 150 mL of water.
 20. Determine the concentration of a solution containing 0.3 moles of CH₃COOH in 400 mL of solution.
 21. Calculate the ionic strength of a 0.1 M solution of NaCl and MgCl₂.
 22. Determine the ionic strength of a solution containing 0.2 M KBr and 0.1 M Mg(NO₃)₂.
 23. What is the ionic strength of a 0.05 M solution of Na₂SO₄ and 0.1 M NaCl?
 24. Find the ionic strength of a solution containing 0.1 M CaCl₂ and 0.1 M KNO₃.
 25. Calculate the ionic strength of a 0.2 M solution of AlCl₃ and 0.05 M K₂SO₄.
 26. How much water is needed to dilute 300 mL of 2 M HNO₃ solution to a 1 M solution?
 27. What is the final volume of solution when 500 mL of 2 M NaOH is diluted to a 0.5 M solution?
 28. Calculate the volume of a solution required to dilute 1 L of 0.2 M HCl to a 0.05 M solution.
 29. How much water is needed to dilute 750 mL of a 4 M solution of Na₂SO₄ to a 1 M solution?
 30. What is the volume of solution required to dissolve 35 g of NaCl to make a 0.5 M solution?
-

Hard Level (0.4 points each * 10 problems = 4.0 points total)

31. Calculate the final concentration of a solution made by mixing 100 mL of 1 M H_2SO_4 with 200 mL of 0.5 M NaOH and 50 mL of water.
32. A solution is prepared by dissolving 60 g of CaCl_2 in 400 mL of water. Determine its concentration.
33. Find the concentration of a solution formed by mixing 200 mL of 0.5 M NaOH with 300 mL of 0.25 M HCl.
34. Calculate the concentration of a solution prepared by dissolving 80 g of K_2SO_4 in 500 mL of water.
35. Determine the molarity of a solution prepared by dissolving 100 g of Na_2CO_3 in 750 mL of water.
36. Calculate the ionic strength of a solution containing 0.1 M NaCl, 0.1 M CaCl_2 , and 0.05 M AlCl_3 .
37. Determine the ionic strength of a solution with 0.2 M KNO_3 , 0.1 M Na_2SO_4 , and 0.05 M MgCl_2 .
38. Find the ionic strength of a solution containing 0.1 M Na_2SO_4 , 0.05 M MgSO_4 , and 0.1 M CaCl_2 .
39. Calculate the ionic strength of a solution with 0.1 M $\text{Al}(\text{NO}_3)_3$, 0.1 M NaCl, and 0.05 M K_2SO_4 .
40. Determine the ionic strength of a solution containing 0.2 M Na_2CO_3 , 0.1 M CaCl_2 , and 0.05 M NH_4NO_3 .