

Solution Stoichiometry Practice Questions

1. If 1.50 moles of aluminum sulphate are dissolved in 2.25 L of water, calculate $[\text{SO}_4^{2-}]$.
2. If you dissolve 0.240 moles of ammonium carbonate in 320 mL of water, calculate the ammonium ion concentration.
3. If the $[\text{Cl}^-] = 0.015 \text{ M}$ in 75 mL of water, how many moles of iron (III) chloride were there?
4. How much water would you need if you started with 1.20 moles of sodium oxalate but wanted a solution with $[\text{Na}^+] = 0.48 \text{ M}$?
5. If you have 1.25 L of a 0.50 M nickel (III) acetate solution, calculate the $[\text{CH}_3\text{COO}^-]$.
6. How many grams of strontium hydroxide would be found in 5.00 L of a 1.25 M strontium hydroxide solution?
7. How many grams of chromium (III) thiocyanate would be found in 2.00 L of a 0.36 M $[\text{SCN}^-]$ solution?
8. 38.8 g of potassium chromate are dissolved in 250 mL of water. Calculate the potassium ion concentration.
9. How much water would you need in order to dissolve 21.5 g of calcium perchlorate to end up with a solution having $[\text{ClO}_4^-] = 0.050 \text{ M}$?
10. 54.0 g of $\text{C}_{12}\text{H}_{24}\text{O}_{12}$ are dissolved in 750 mL of water.
 - a. Will there be any ions? How do you know?
 - b. Calculate $[\text{C}_{12}\text{H}_{24}\text{O}_{12}]$.
11. 350 mL of a 0.75 M $\text{Rb}_2\text{Cr}_2\text{O}_7$ solution is allowed to sit on a table until all the water evaporates:
 - a. Will the $\text{Rb}_2\text{Cr}_2\text{O}_7$ evaporate along with the water? Explain your answer.
 - b. Calculate how many grams of $\text{Rb}_2\text{Cr}_2\text{O}_7$ will remain.
12. 2.5 litres of seawater are found to contain, amongst other things, 0.0146 g of calcium bicarbonate. If the temperature goes down to -14°C , the water will freeze into ice leaving only 1.2 litres of seawater left.
 - a. Will any of the calcium bicarbonate be in the ice?
 - b. Calculate the concentration of the bicarbonate ions.
13. 125 mL of a 0.45 M barium cyanide solution is diluted until the volume becomes 375 mL. Calculate the diluted $[\text{CN}^-]$.

14. 480 mL of a 0.20 M nickel (III) sulphate solution is diluted until the diluted $[\text{Ni}^{+3}]$ is 0.10 M. Calculate the diluted volume of the solution.
15. A solution of 1.56 M $(\text{NH}_4)_2\text{C}_2\text{O}_4$ is diluted until the volume is 2.00 L and the $[\text{NH}_4^+] = 0.39$ M. Calculate the original volume of the solution.
16. 475 mL of a lead (IV) acetate solution is diluted to 1.90 L. The diluted acetate concentration is 0.0720 M. What was the original lead (IV) ion concentration?
17. Hulio started out with 1.24 L of a 0.81 M magnesium chlorate solution. He added water until the diluted chlorate concentration was 0.27M. How much water did he add?
18. 3.75 L of a 0.64M tin (IV) sulphate solution is diluted until the volume is 10.00 L. Calculate the diluted sulphate concentration.
19. 225 mL of a 0.036 M chromium (III) phosphate solution is diluted until the $[\text{PO}_4^{-3}]$ is 0.0018 M. Calculate the diluted volume.
20. 125 mL of a 0.120 M aluminum sulphate solution is added to 225 mL of a 0.160 M calcium iodide solution.
- Write a balanced formula equation
 - Write a balanced net ionic equation
 - Calculate how many grams of precipitate should form.
 - If 4.90 g of precipitate are recovered, calculate % yield
 - Calculate [] of all spectator ions
21. 180 mL of a 0.025 M barium sulphide solution are added to 120 mL of a 0.030 M iron (III) nitrate solution.
- Write a balanced formula equation
 - Write a balanced net ionic equation
 - Calculate how many grams of precipitate should form.
 - If .016 g of precipitate is recovered, calculate % yield.
 - Calculate [] of all spectator ions
22. 675 mL of a 0.80 M copper (II) acetate solution is added to 325 mL of a 0.60 M potassium chloride solution.
- Write a balanced formula equation
 - Write a balanced net ionic equation
 - Calculate how many grams of precipitate should form.
 - Calculate [] of all spectator ions.
23. 275 mL of a 0.150 M nickel (III) sulphate solution is added to 125 mL of a 0.36M strontium hydroxide solution.
- Write a balanced formula equation
 - Write a balanced net ionic equation
 - Calculate how many grams of precipitate should form