

1. How many grams of sodium nitrate can be dissolved in 100 ml of water at 45 °C?

110 grams

2. 50 grams of ammonium chloride dissolved in 100 ml of water at 50 °C, would create what type of solution?

Saturated

3. 30 grams of sodium chloride dissolved in 100 ml of water at 90 °C, would create what type of solution?

unsaturated

4. How many grams of NH_3 could dissolve in 40 °C in 100 ml of water?

35 grams

5. How many grams of KI could dissolve in 50 ml of water at 20 °C?

72.5 grams

6. 40 grams of potassium chloride is dissolved in 100 ml of water. At 80 °C, how many more grams would create a saturated solution?

10 grams

7. Balance the reaction: $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + 2 \text{NaCl}$

a) If 45.0 grams of barium chloride is used, how many grams of barium sulfate would be created?

50.4 g BaSO_4

b) If 5.32 moles of sodium sulfate react, how many moles of sodium chloride could be formed?

10.6 mol NaCl

8. How many grams of sodium sulfate would be required to create 450 ml of a 2.0 M solution?

110 g Na_2SO_4

9. How many liters of solution will be needed to create a 2.45 M solution containing 60.0 grams of barium chloride?

0.118 L BaCl_2

10. Inside the stock room, the barium chloride is stored at a 12 M concentration. If 25 mL of the stock solution was taken, how much water would be required to dilute it into a 3.75 M solution?

55 mL water added

11. Write the balanced equation for the reaction between sulfuric acid and aluminum hydroxide.



a) If you have 4.6 moles of sulfuric acid, how many grams of water would form?

$$9.2 \text{ mol H}_2\text{O}$$

12. Determine the mass of 5.6 moles of carbon dioxide gas.

$$250 \text{ g CO}_2$$

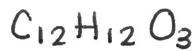
13. How many particles make up 1.23 moles of calcium phosphate?

$$7.40 \times 10^{23} \text{ molecules Ca}_3(\text{PO}_4)_2$$

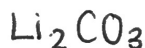
14. What is the mass of 6.34×10^{24} particles of copper (I) chlorate?

$$155 \text{ g CuClO}_3$$

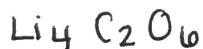
15. A compound with an empirical formula of $\text{C}_4\text{H}_4\text{O}$ and a molar mass of 136 grams per mole. What is the molecular formula of this compound?



16. What's the empirical formula of a molecule containing 18.7% lithium, 16.3% carbon, and 65.0% oxygen?



17. If the molar mass of the compound in problem 16 is 147.6 grams/mole, what's the molecular formula?



18. Determine the % composition for each element in the following compounds:

a. Barium phosphate

$$\text{Ba} = 59.1\% \quad \text{P} = 13.3\% \quad \text{O} = 27.6\%$$

b. Gold (II) chlorate

$$\text{Au} = 54.1\% \quad \text{Cl} = 19.5\% \quad \text{O} = 26.4\%$$

19. List the three different types of solvation and describe each:

1. Dissolve = separate molecules (break intermolecular forces)
2. Dissociate = separate ions (break ionic bonds)
3. Ionize = form ions (break covalent bonds)

20. What does not change when a solution is diluted?

Amount of solute

21. What is the percent by mass of a solution that contains 7.1 moles of strontium nitrate dissolved in 2.5 L of water?

$$45.6\%$$

22. Define the following terms:

Aqueous: A substance dissolved in water

Precipitate: A solid formed from 2 aqueous solutions

23. Aqueous solutions of aluminum bromide and potassium carbonate are mixed. If the reaction will occur, use solubility rules to determine which product is the precipitate.

$\text{Al}_2(\text{CO}_3)_3$ is the precipitate.