

Mass crucible (g)	11.12
Mass of titanium (g)	8.82
Mass of crucible and product (g)	22.998

What is the empirical formula of titanium sulfide? (Ar Ti = 47.867 g mol⁻¹)

- A. TiS C. Ti₂S₂
B. Ti₂S D. TiS₂

10. What volume of water in cm³ should be added to 10.0 cm³ of NaOH 6.0 M to produce a solution of NaOH 0.3 M?

- A. 10 C. 200
B. 190 D. 500

11. Which of the following statements is **NOT** true about 2 L of 0.1 M Ca₃(PO₄)₂ solution?

- A. This solution contains 0.2 mol of Ca₃(PO₄)₂
B. This solution contains 0.8 mol of oxygen atoms
C. 2 L of this solution produces 0.6 mole of calcium ions
D. 500 mL of this solution contains 6.02 × 10²² phosphorus atoms

12. The density of 95% by mass of sulphuric acid, H₂SO₄ is 1.84 g mL⁻¹. Calculate the molarity of H₂SO₄ solution.

- A. 15.50 M C. 1.80 M
B. 10.23 M D. 17.82 M

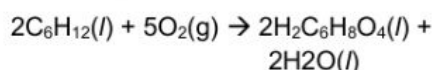
13. Density solution of 0.03 mol of NaCl in 100.0 g of water is 1.02 g/mL. Calculate the mole fraction.

- A. 0.0003 C. 0.0027
B. 0.0058 D. 0.0540

14. Rubbing alcohol is commonly used as an antiseptic for small cuts. It is sold as 70% (v/v) solution of isopropyl alcohol in water. What volume of isopropyl alcohol is used to make 500 mL of rubbing alcohol?

- A. 357 mL. C. 400 mL
B. 350 mL D. 385 mL

15. Adipic acid, H₂C₆H₈O₄, is produced by a reaction between cyclohexane and excess oxygen. The equation for the reaction is:



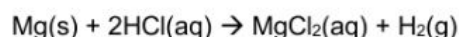
If 45.0 g of cyclohexane is used, calculate the theoretical yield of the adipic acid.

- A. 73.8 g C. 75.8 g
B. 83.7 g D. 78.3 g

16. A 72.0 g vanadium pentoxide, V₂O₅, reacts with excess aluminium, Al at high temperature to produce vanadium metal, and aluminium oxide, Al₂O₃. Calculate the mass vanadium produced. [Ar V: 51]

- A. 4.04 g C. 44.0 g
B. 40.4 g D. 4.40 g

17. In an experiment, 1.46 g of magnesium is added into 160.00 mL of 0.50 mol L⁻¹ hydrochloric acid. The reaction involved is:



Determine the limiting reactant.

- A. Mg(s) C. MgCl₂ (aq)
B. HCl (aq) D. H₂(g)