

Chapter 8

End-of-Chapter Questions

- Calculate the formula mass for each of the following ionic compounds to one decimal place:
(a) Na_2S (b) CaCO_3 (c) $\text{Al}(\text{NO}_3)_3$
- Calculate the molecular mass for each of the following covalent compounds to one decimal place:
(a) NO_2 (b) P_4O_6 (c) IF_7
- Calculate the molar mass for each of the following compounds to one decimal place:
(a) SnI_4 (b) PF_5 (c) $(\text{NH}_4)_2\text{SO}_4$
- Calculate the molar mass for each of the following compounds to one decimal place:
(a) SF_6 (b) $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ (c) $\text{Mg}_3(\text{PO}_4)_2$
- Calculate the number of moles of compound in:
(a) 17.5 g of PbCl_2 (b) 0.678 g of SiO_2
- Calculate the number of moles of compound in:
(a) 2.66 kg of MgSO_4 (b) 1.54 mg of Ag_2S
- Calculate the mass of compound in:
(a) 0.546 mol of BaBr_2 (b) 1.6×10^{-2} mol of Cu_2O
- Calculate the mass of compound in:
(a) 1.87 mol of PbCrO_4 (b) 2.5×10^{-2} mol of NCl_3
- Calculate the number of atoms of oxygen in 4.20 mol of dinitrogen trioxide.
- Calculate the number of oxide ions in 0.865 mol of iron(III) oxide.
- Calculate the number of fluorine atoms in 2.49 g of sulfur tetrafluoride.
- Calculate the number of fluoride ions in 0.865 g of lead(IV) fluoride.
- Calculate the percentage of chlorine in phosphorus trichloride.
- Calculate the percentage of oxygen in calcium carbonate.

15. Determine the empirical formula of a compound which consists of 48.0% zinc and 52.0% chlorine by mass.
16. Determine the empirical formula of a compound which consists of 19.0% tin and 81.0% iodine by mass.
17. Determine the empirical formula of a compound which consists of 62.6% lead, 8.5% nitrogen, and the remainder being oxygen, by mass.
18. Determine the empirical formula of a compound which consists of 36.5% sodium, 25.4% sulfur, and the remainder being oxygen, by mass.
19. A compound consists of 38.7% carbon, 9.8% hydrogen, and 51.5% oxygen by mass. If the molar mass of the compound is $62.1 \text{ g}\cdot\text{mol}^{-1}$, what is the molecular formula of the compound?
20. A compound consists of 48.6% carbon, 8.2% hydrogen, and 43.2% oxygen by mass. What is the empirical formula of the compound? If the molar mass of the compound is $74.1 \text{ g}\cdot\text{mol}^{-1}$, what is the molecular formula of the compound?
21. After a 4.626 g sample of a compound of silver and oxygen is heated strongly, on cooling, 4.306 g of silver metal remains. What is the empirical formula of the compound?
22. When 3.76 g of manganese metal is heated, 7.59 g of an oxide of manganese is formed. What is the empirical formula of the compound?
23. When 7.52 g of hydrated iron(III) phosphate is heated, 5.54 g of anhydrous iron(III) phosphate remain. What is the empirical formula of the hydrate.
24. When 3.62 g of anhydrous calcium chloride is left open to the moist air, 3.52 g of water is absorbed. What is the empirical formula of the hydrate.