

From textbook: (1, 11, 35, 37, 39, 41, 43, 45, 45, 47, 67, 69, 75, 77, 79, 83, 85, 87, 89, 91, 97, 103, 107, 109, 115, 119, 121, 127, 129 and 131)

- Which one of the following is most likely to be an ionic compound?
A. KF B. CCl₄ C. CS₂ D. CO₂ E. ICl
- Which one of the following is most likely to be an ionic compound?
A. GaAs B. SrBr₂ C. NO₂ D. CBr₄ E. H₂O
- Which one of the following is most likely to be an ionic compound?
A. NCl₃ B. BaCl₂ C. CO D. SO₂ E. SF₄
- Which one of the following is most likely to be a covalent compound?
A. Rb₂S B. SrCl₂ C. CS₂ D. CaO E. MgI₂
- Which one of the following is most likely to be a covalent compound?
A. KF B. CaCl₂ C. SF₄ D. Al₂O₃ E. CaSO₄
- A polar covalent bond would form in which one of the following pairs of atoms?
A. Cl — Cl B. Si — Si C. Ca — Cl D. Cr — Br E. P — Cl
- What type of chemical bond holds the atoms together within a water molecule?
A. Ionic bond B. Nonpolar covalent bond C. Polar covalent bond
- A *nonpolar* covalent bond (i.e., pure covalent) would form in which one of the following pairs of atoms?
A. Na — Cl B. H — Cl C. Li — Br D. Se — Br E. Br — Br
- Which of the bonds below would have the *greatest* polarity (i.e., highest percent ionic character)?
A. Si — P B. Si — S C. Si — Se D. Si — Cl E. Si — I
- Classify the O — H bond in CH₃OH as ionic, polar covalent, or nonpolar covalent.
A. ionic B. polar covalent C. nonpolar covalent
- Classify the C — Cl bond in CCl₄ as ionic, polar covalent, or nonpolar covalent.
A. ionic B. polar covalent C. nonpolar covalent
- Classify the Ca — Cl bond in CaCl₂ as ionic, polar covalent, or nonpolar covalent.
A. ionic B. polar covalent C. nonpolar covalent
- What is the molar mass of ammonium nitrate?
- How many oxygen atoms are present in 1.00×10^{-3} mole of ozone, O₃?

15. How many oxygen atoms are in 1.00 mol SO_3 ?
16. What is the mass percent oxygen in copper(II) sulfate pentahydrate?
17. Calculate the percent composition by mass of all the elements in Na_2CO_3 .
18. The molar mass of hydrazine is 32 g/mol and its empirical formula is NH_2 . What is its molecular formula?
19. Ketoprofen is an anti-inflammatory drug which is 75.59% C, 5.51% H, and 18.90% O. If the molecular mass of ketoprofen is 254 g/mol, what is its molecular formula?
20. What is the empirical formula of a compound of uranium and fluorine that is composed of 67.6% uranium and 32.4% fluorine?
21. The percent composition by mass of a compound is 76.0% C, 12.8% H, and 11.2% O. The molar mass of this compound is 284.5 g/mol. What is the molecular formula of the compound?
22. A 0.600 g sample of a compound of arsenic and oxygen was found to contain 0.454 g of arsenic. What is the empirical formula of the compound?
23. 2.386 g of a compound containing only Carbon, Hydrogen and Oxygen undergoes combustion analysis to produce 5.77 g CO_2 and 2.14 g H_2O . What is the empirical formula of this compound?
24. Vitamin C is essential for the prevention of scurvy. Combustion of a 2.00 gram sample of this Carbon, Hydrogen and Oxygen containing compound yields 2.998 g CO_2 and 0.819 g H_2O . What is the empirical formula and percent composition of Vitamin C?
25. An 0.1888-g sample of a hydrocarbon produces 0.6270 g of CO_2 and 0.1602 g H_2O in combustion analysis. Its molar mass is found to be 106 g/mol. For this hydrocarbon, determine A) Its percent composition; B) Its empirical formula and C) its molecular formula
26. Para-cresol is used as a disinfectant and in the manufacture of herbicides and artificial food flavors. A 0.4039-g sample of this carbon-hydrogen-oxygen containing compound yields 1.1518 g CO_2 and 0.2694 g H_2O . What is the empirical formula of para-cresol?

Answers

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|--------------------------------------------|-----------------------------------|--------------------------------------------|--------------------------------------|-------------------------------|-----------------|------|
| 1. A | 2. B | 3. B | 4. C | 5. C | 6. E | 7. C |
| 8. E | 9. D | 10. B | 11. B | 12. A | 13. 80.05 g/mol | |
| 14. 1.81×10^{21} O atoms | 15. 1.81×10^{24} O atoms | 16. 57.7% Oxygen | | | | |
| 17. 43.4% Na, 11.3% C, 45.3% O | 18. N_2H_4 | 19. $\text{C}_{16}\text{H}_{14}\text{O}_3$ | 20. UF_6 | | | |
| 21. $\text{C}_{18}\text{H}_{36}\text{O}_2$ | 22. As_2O_3 | 23. $\text{C}_{11}\text{H}_{20}\text{O}_3$ | 24. $\text{C}_3\text{H}_4\text{O}_3$ | 40.91% C 4.58% H and 54.51% O | | |
| 25. A) 90.56% C 9.44% H | b) C_4H_5 | C) C_8H_{10} | 26. $\text{C}_7\text{H}_8\text{O}$ | | | |