

Unit 4: The Mole and the Chemical CompositionChapter 7: The Mole and Chemical Composition7.1: Avogadro's Number and Molar Conversion

(Practice on pg. 228)

1. 1.13×10^{23} ions Na^+
2. 8.73×10^6 atoms As
3. 2.544×10^{24} molecules $\text{C}_2\text{H}_4\text{O}_2$
4. 3.6×10^{24} formula units NaOH

(Practice on pg. 229)

1. 0.940 mol Xe
2. 4.796×10^{-9} mol AgNO_3
3. 4.5×10^{-7} mol termites
4. 94.0 mol Li^+
5. (a) 1.050×10^{-2} mol O
(b) 5.249×10^{-3} mol C
(d) 8.841×10^{-8} mol K^+
(e) 3.321×10^{-10} mol Cl^-
(g) 6.641×10^2 mol O
(c) 3.690 mol O
(f) 6.642×10^{-10} mol N

(Practice on pg. 231)

1. 223 g Cu
2. 29.2 g NaCl
3. 1063 g CH_4
4. 237 g Ti

(Practice on pg. 232)

1. 2.25×10^{24} atoms Cu
2. 3.00×10^{23} ions Ca^{2+}
3. 9.33×10^{25} atoms As

(Section Review on pg. 229)

6. (a) 1.20×10^{24} ions Fe^{3+}
(b) 2.7×10^{24} molecules BCl_3
(c) 1.5×10^{23} ions K^+
(d) 3.626×10^{24} molecules O_2
7. (a) 3.61×10^{24} ions Na^+ ions
(b) 7.23×10^{24} Na^+ ions
8. (a) 0.500 mol H_2O
(b) 0.1661 mol C
9. (a) 2.86×10^{-7} g He
(b) 15.22 g CH_4
10. (a) 4.745×10^{21} ions I^-
(b) 3.3×10^{22} ions Cu^{2+}
11. 206.3 g ibuprofen
12. (a) 26.7 g Ca
(b) 50. g boron-11
13. (a) 1.204×10^{24} molecules H_2
(b) 1.21×10^{23} molecules HF
(c) 3.08×10^{24} Na^+ ions
(c) 0.09316 mol Na^+
(c) 200.5 g Ca^{2+}
(c) 3.97×10^{22} molecules SO_2
(c) 7.032×10^{-4} g Na^+
(c) 2.7×10^{24} molecules $\text{C}_6\text{H}_{12}\text{O}_6$

7.2: Relative Atomic Mass and Chemical Formulas

(Practice on pg. 236)

1. 69.73 amu
2. 15.99 amu

(Practice on pg. 239–240)

1. (a) 259.80 g/mol
(b) 136.06 g/mol
(d) 253.80 g/mol
(e) 60.06 g/mol
2. (a) NaHCO_3 , 84.01 g/mol
(b) CeB_6 , 204.98 g/mol
(d) $\text{Al}_2(\text{SO}_4)_3$, 342.17 g/mol
(e) Fe(OH)_3 , 106.88 g/mol
(g) P_4O_{10} , 283.88 g/mol
(h) ICl , 162.35 g/mol
3. (a) 92.15 g/mol
(b) 0.0815 g/mol $\text{C}_6\text{H}_5\text{CH}_3$
4. (a) 300.06 g/mol
(b) 2.050 g $\text{PtCl}_2(\text{NH}_3)_2$
(c) 342.34 g/mol
(f) 262.84 g/mol
(c) $\text{Mg}(\text{ClO}_4)_2$, 223.20 g/mol
(f) SnCl_2 , 189.61 g/mol

(Section Review on pg. 240)

8. 51.99 amu
9. 10.80 amu, boron
10. (a) 168.35 g/mol
(b) 122.55 g/mol
(d) 132.08 g/mol
(e) 75.08 g/mol
11. (a) SrS , 119.69 g/mol, 1.76×10^{-2} mol SrS
(b) PF_3 , 87.97 g/mol, 2.40×10^{-2} mol PF_3
(c) $\text{Zn}(\text{CH}_3\text{COO})_2$, 183.49 g/mol, 1.15×10^{-2} mol $\text{Zn}(\text{CH}_3\text{COO})_2$
(d) $\text{Hg}(\text{BrO}_3)_2$, 456.39 g/mol, 4.62×10^{-3} mol $\text{Hg}(\text{BrO}_3)_2$
(e) $\text{Ca}(\text{NO}_3)_2$, 164.10 g/mol, 1.29×10^{-2} mol $\text{Ca}(\text{NO}_3)_2$
16. (a) 8 H atoms
(b) 4.818×10^{24} H atoms
(c) 180.18 g/mol

7.3: Formulas and Percentage Composition

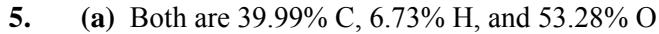
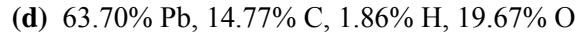
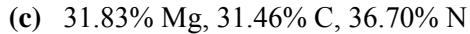
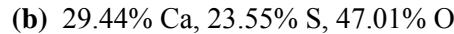
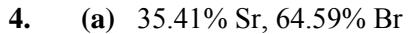
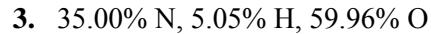
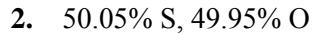
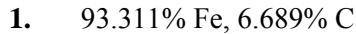
(Practice on pg. 243)



(Practice on pg. 245)

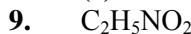
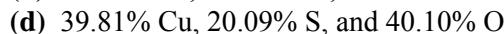
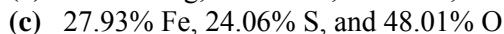
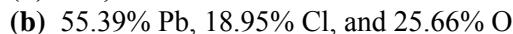
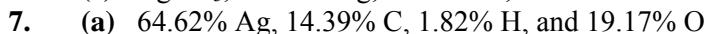
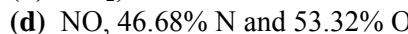
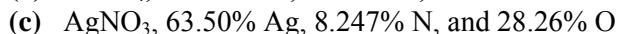
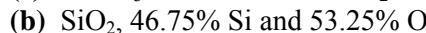
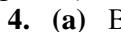


(Practice on pg. 248)

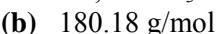
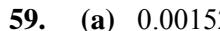
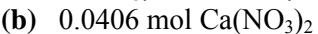
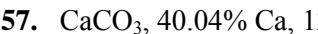
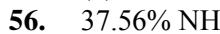
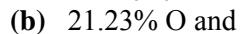
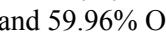
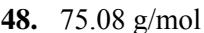
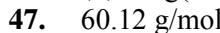
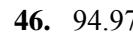
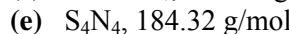
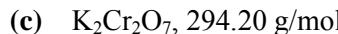
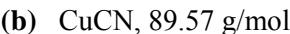
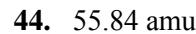
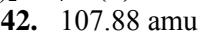
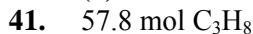
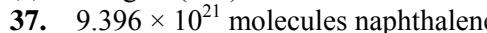
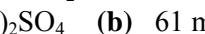
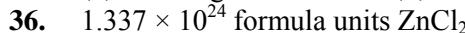
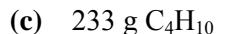
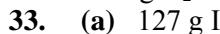
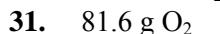
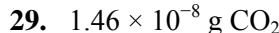
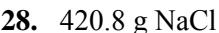
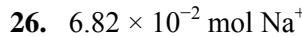
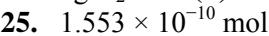
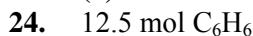
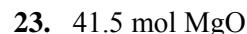
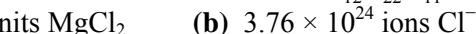
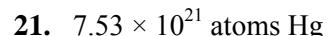


(b) The percentage composition of the empirical formula is the same as that of the molecular formulas.

(Section Review on pg. 248)

10. No. The given experimental mass is not a whole number multiple of the molar mass of CH_2O – 30.03 g/mol

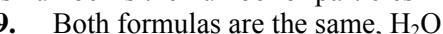
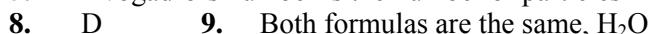
(Chapter Review on pg. 251 to 254)

66. AlPO_4 is 22.12 % Al, while AlCl_3 is 20.23% Al, so aluminium phosphate has more aluminium per gram.

(Standardize Test Prep on pg. 256 & 257)



5. Avogadro's number is the number of particles in a mole.



11. Although there are twice as many oxygen atoms in carbon dioxide, the percentage composition is based on the same mass, not the number of atoms.

