Honors Chemistry

Answers to Chapter 2 Study Questions

1. a) law of multiple proportions b) law of conservation of mass
   c) law of definite proportion

2. Rutherford's experiment supported the ideas that atoms contain a small dense center (nucleus) and are mostly empty space.

3.

Nuclear Symbol	Atomic Number	Mass Number	Number of Protons	Number of Electrons	Number of Neutrons	Charge
$^{40}_{18}Ar$	18	40	18	18	22	0
$^{39}_{19}K^{+}$	19	39	19	18	20	+1
$^{36}_{16}S^{2-}$	16	36	16	18	20	-2

4. $^{20}_{10}Ne$ and $^{22}_{10}Ne$

5. a) MG, Group 2, metal, Period 5 b) MG, Group 17, nonmetal, Period 4
   c) TM, Period 5 d) MG, Group 15, nonmetal, Period 3
   e) MG, Group 13, metalloid, Period 2 f) ITM, Period 7
   g) MG, Group 14, metal, Period 5 h) TM, Period 6

6. Group 1 = alkali metals; Group 2 = alkaline earth metals; Group 17 = halogens; Group 18 = noble gases.

7. Elements: O_2, N_2, Cl_2, or any other diatomic element. Compounds: CO_2, H_2O, NH_3, or any other covalent compound.

8. a) positive, +1 b) positive, +2 c) negative, –1 d) negative, –2 e) positive, +1

9. a) covalent, dinitrogen oxide or dinitrogen monoxide b) ionic, potassium oxide
   c) covalent, phosphorus trichloride d) ionic, aluminum phosphate
   e) covalent, hydrochloric acid f) ionic, ammonium fluoride
   g) ionic, lead(II) nitrite h) covalent, sulfurous acid

10. a) calcium carbonate b) zinc sulfide c) copper(I) hydroxide
    d) magnesium perchlorate

11. a) K_3PO_4 b) $(NH_4)_2SO_4$ c) $Co(OH)_2$ d) FeN

12. a) PI_3 b) N_2O_5 c) $HClO_3$