

Ch 2 Practice Problems

- According to the law of definite proportions,
 - if the same two elements form two different compounds, they do so in the same ratio.
 - it is not possible for the same two elements to form more than one compound.
 - the ratio of the masses of the elements in a compound is always the same.
 - the total mass after a chemical change is the same as before the change.
- Which of the following pairs of compounds can be used to illustrate the law of multiple proportions?
 - NH_3 and NCl_3
 - ZnO and ZnCl_2
 - H_2O and HI
 - NO and NO_2
 - CH_4 and CO_2
- Which one of the following statements about atomic structure is false?
 - The electrons occupy a very large volume compared to the nucleus.
 - Almost all of the mass of the atom is concentrated in the nucleus.
 - The protons and neutrons in the nucleus are very tightly packed.
 - The number of protons and the number of neutrons are always the same in the neutral atom.
- Which of the following atomic symbols is incorrect?
 - ${}^{20}_{10}\text{Ne}$
 - ${}^{32}_{16}\text{S}$
 - ${}^{28}_{14}\text{Si}$
 - ${}^{40}_{20}\text{Ca}$
 - ${}^{12}_8\text{C}$
- The element rhenium (Re) exists as two stable isotopes and 18 unstable isotopes. Rhenium-185 has in its nucleus
 - 75 protons, 75 neutrons.
 - 75 protons, 130 neutrons.
 - 130 protons, 75 neutrons.
 - 75 protons, 110 neutrons.
 - not enough information is given.
- Which among the following represent a set of isotopes? Atomic nuclei containing
 - 20 protons and 20 neutrons.
 - 21 protons and 19 neutrons.
 - 22 neutrons and 18 protons.
 - 20 protons and 22 neutrons.
 - 21 protons and 20 neutrons.
 - I, II, III
 - III, IV
 - I, V
 - I, IV and II, V
 - No isotopes are indicated.

7. An ion is formed

- I. by either adding protons to or subtracting protons from the atom.
- II. by either adding electrons to or subtracting electrons from the atom.
- III. by either adding neutrons to or subtracting neutrons from the atom.

- A) Only I is true.
- B) Only II is true.
- C) Only III is true.
- D) All of the statements are true.
- E) Two of the statements are true.

8. Which of the following represents a pair of isotopes?

- A) $^{14}_6\text{C}$, $^{14}_7\text{N}$
- B) ^1_1H , ^2_1H
- C) $^{14}_7\text{N}$, $^{15}_8\text{O}$
- D) C, C_{60}
- E) $^{31}_{15}\text{P}$, $^{31}_{15}\text{P}^{3-}$

9. The ion ^{127}I has

- A) 53 protons, 74 neutrons, 54 electrons
- B) 53 protons, 74 neutrons, 53 electrons
- C) 53 protons, 74 neutrons, 52 electrons
- D) 53 protons, 127 neutrons, 54 electrons
- E) 53 protons, 53 neutrons, 53 electrons

10. An element's most stable ion forms an ionic compound with chlorine having the formula XCl_2 . If the mass number of the ion is 40 and it has 18 electrons, what is the element and how many neutrons does it have?

- A) Ar, 22 neutrons
- B) Ar, 24 neutrons
- C) S, 24 neutrons
- D) Ca, 20 neutrons
- E) K, 19 neutrons

11. Which are alkaline earth halides?

- A) NaI, KBr, LiF
- B) CaF_2 , MgBr_2 , SrI_2
- C) PbI_2 , PbBr_2 , CdF_2
- D) MgO , MgS , CaO
- E) Al_2O_3 , In_2O_3 , Ga_2S_3

12. Select the group of symbols that would correctly complete the following statements, respectively.

___ is the heaviest noble gas.

___ is the transition metal that has 24 electrons as a 3+ ion.

___ is the halogen in the third period.

___ is the alkaline earth metal that has 18 electrons as a stable ion.

- A) Rn, Cr, Br, Ca
- B) Ra, Co, Cl, K
- C) Rn, Co, Cl, Ca
- D) Ra, Sc, Br, K

13. _____ form ions with a 2+ charge when they react with nonmetals.
- A) Alkali metals
 - B) Alkaline earth metals
 - C) Halogens
 - D) Noble gases
 - E) None of these choices
14. Which of the following formulas is *not* correct?
- A) MgSO_3
 - B) $\text{Ba}(\text{NO}_3)_2$
 - C) NaS
 - D) KCl
 - E) NH_4I
15. Which of the following is *not* the correct chemical formula for the compound named?
- A)
 NaOH sodium hydroxide

 - B)
 Fe_3SO_4 iron(III) sulfate

 - C)
 HCl hydrogen chloride

 - D)
 CaBr_2 calcium bromide

 - E)
 Mg_3N_2 magnesium nitride
16. Which of the following is *not* the correct name for the formula given?
- A)
 Fe_2O_3 iron(III) oxide

 - B)
 PBr_5 phosphorus pentabromide

 - C)
 CoO cobalt(II) oxide

 - D)
 CaSO_4 calcium sulfite

 - E)
 HClO hypochlorous acid

17. What is the correct formula for aluminum carbonate?

- A) AlCO_3
- B) $\text{Al}_2(\text{CO}_3)_3$
- C) $\text{Al}_3(\text{CO}_3)_2$
- D) Al_2CO_3
- E) Al_3CO_3

18. What is the correct formula for chromium(VI) oxide?

- A) CrO_6
- B) Cr_6O
- C) CrO_3
- D) Cr_2O_3
- E) CrO_2

19. What is the correct name for H_3PO_3 ?

- A) hydrogen phosphate
- B) trihydrogen phosphate
- C) phosphoric acid
- D) phosphorous acid
- E) hydrogen phosphorous acid

20. What is the correct formula for hydrocyanic acid?

- A) HCl
- B) HCN
- C) CN^-
- D) H_2CN
- E) HCN_2

Answers:

1. C 2. D 3. D 4. E 5. D 6. D 7. B 8. B 9. A 10. D 11. B 12. C
13. B 14. C 15. B 16. D 17. B 18. C 19. D 20. B