Chapter 1—The Atomic Nature of Matter: Selected Questions for Practice Exam.

6. Substances that cannot be decomposed into two or more simpler substances by chemical means are called
   a. pure substances.
   b. compounds.
   c. molecules.
   d. elements.
   e. none of these

7. A pure solid decomposes on heating, yielding a solid and a gas, each of which is a pure substance. From this we can conclude with certainty that
   a. the original solid is not an element.
   b. at least one of the products is an element.
   c. both products are elements.
   d. both (a) and (b)
   e. none of these

8. The gases H_2, O_2, and N_2 are considered to be
   a. elements.
   b. compounds.
   c. atoms.
   d. mixtures.
   e. none of these

9. Potassium carbonate, calcium chloride, and iron(III) oxide are all considered to be
   a. elements.
   b. compounds.
   c. atoms.
   d. mixtures.
   e. none of these

12. A sample contains copper(I) chloride at a purity of 95.2%. If 2.00×10^2 g of the compound is present, the total mass of the sample must be
   a. 96.0 g
   b. 190 g
   c. 210 g
   d. 417 g
   e. none of these

13. A pure sample of an iron oxide weighing 14.8 g is heated in a stream of $H_2(g)$ until it is completely converted to iron. If the iron produced has a mass of 10.36 g, the percentage of oxygen in the original oxide must have been
    a. 14.3%
    b. 30.0%
    c. 70.0%
    d. 85.7%
    e. none of these

14. "In every chemical operation an equal quantity of matter exists before and after the operation" is a statement of the law of
    a. conservation of mass.
    b. multiple proportions.
    c. definite proportions.
    d. combining volumes.
    e. none of these

15. Analysis of a sample of magnesium oxide shows that it contains 2.28 g of magnesium and 1.50 g of oxygen. If a second sample of the same oxide contains 13.91 g of magnesium, how much oxygen does it contain?
    a. 0.109 g
    b. 1.00 g
    c. 9.15 g
    d. 21.1 g
    e. none of these

16. In a given chemical compound, the proportions by mass of the elements that compose it are
    a. variable but in ratios of small integers.
    b. dependent on the origin of the compound.
    c. dependent on the mode of preparation of the compound.
    d. All of the above are correct.
    e. None of the above is correct.

17. If two samples labeled "NaCl" are analyzed and found to contain different percentages of chlorine, which of the following is probably true?
    a. There must be at least two different compounds with the formula NaCl.
    b. The two samples must have been from different origins.
    c. The ratio of the two different chlorine percentages must result in a small integer value.
    d. At least one of the samples must not be pure.
    e. None of these.

18. An unknown mass of element A reacts completely with 1.811 g of element B and 3.613 g of element C to produce 7.124 g of a compound containing A, B, and C. What additional information is required in order to calculate the unknown mass of A?
    a. a balanced equation for the reaction
    b. the molar masses of A, B and C
    c. the formula of the reaction product
    d. All of the above are required.
    e. None of the above is required.

19. The ratio of the number of bismuth atoms to the number of oxygen atoms in $Bi_2(SO_4)_3$ is
    a. 1:6
    b. 2:7
    c. 2:3
    d. 2:1
    e. none of these

20. The ratio of the number of oxygen atoms to the number of silicon atoms in $Si_2O_2(OH)_2$ is
    a. 1:1
    b. 2:1
    c. 3:1
    d. 4:1
    e. none of these

21. A ternary compound contains one atom of scandium and three atoms of nitrogen for every nine atoms of oxygen. A possible formula for the compound is
    a. $Sc(NO_3)_3$
    b. $Sc_2(N_2O_3)_3$
    c. $Sc(NO_2)_4$
    d. $Sc(NO_4)_3$
    e. none of these

22. A binary compound of phosphorus and oxygen in which oxygen atoms are 1 1/2 times as numerous as phosphorus atoms might be
    a. P_2O_4
    b. P_2O_5
    c. P_3O_2
    d. PO_3
    e. none of these

36. In X_2O_3, 60.00 % of the mass is due to X. If the relative atomic mass of X is 50.00, what is the relative atomic mass of oxygen?
    a. 11.11
    b. 22.22
    c. 33.33
    d. 66.66
    e. none of these

37. A compound containing only element Z and oxygen has the formula ZO_3. The decomposition of 100.0 g of the compound yields 79.30 g of Z. If the relative atomic mass of oxygen is 16.000, the relative atomic mass of Z must be
    a. 61.29
    b. 79.30
    c. 122.6
    d. 183.9
    e. none of these

39. The current atomic mass scale is based on the adoption of
    a. exactly 16 as the average relative atomic mass of naturally occurring oxygen.
    b. exactly 12 as the average relative atomic mass of naturally occurring carbon.
    c. exactly 16 as the relative atomic mass of the ^{16}O isotope of oxygen.
    d. exactly 12 as the relative atomic mass of the ^{12}C isotope of carbon.
    e. none of these

49. How many hydrogen atoms are present in 3.41 g of NH_3?
    a. 2.89×10^{22}
    b. 3.62×10^{22}
    c. 1.21×10^{23}
    d. 2.41×10^{23}
    e. none of these

50. 5.80 g of dioxane ($C_4H_8O_2$) is how many moles of dioxane?
    a. 0.0658 mol
    b. 0.0707 mol
    c. 0.0725 mol
    d. 0.0804 mol
    e. none of these

51. How many molecules of tetrahydrofuran (C_4H_8O) are present in 2.00×10^{-9} mol of tetrahydrofuran?
    a. 1.67×10^{13}
    b. 3.01×10^{14}
    c. 1.20×10^{15}
    d. 2.17×10^{16}
    e. none of these

52. 8.55×10^{-3} mol of an unknown compound has a mass of 0.137 g. The compound could be
    a. CH_4
    b. C_2H_6
    c. C_3H_8
    d. C_4H_{10}
    e. none of these

62. Which of the following pairs of compounds share the same empirical formula?
    a. C_3H_3N and C_9H_9N
    b. $C_4H_2N_4O_2$ and $C_6H_4N_4O_2$
    c. $C_4H_4N_2O_2$ and $C_8H_8N_6O_6$
    d. C_8H_9NO and $C_{16}H_{18}N_2O$
    e. none of these

63. A sample of nickel(II) phosphate heptahydrate [$Ni_3(PO_4)_2 \cdot 7H_2O$] contains 0.125 mol of phosphorus. How much water does it contain?
    a. 0.0357 mol
    b. 0.438 mol
    c. 0.875 mol
    d. 1.75 mol
    e. none of these

65. In order to calculate the percentage composition by mass of a compound, it is necessary to know
    a. the relative numbers of each kind of atom making up the compound.
    b. the empirical formula of the compound.
    c. the molecular formula of the compound.
    d. any one of the above.
    e. none of these.

66. What is the atomic percentage of sulfur in a compound with the empirical formula SF_6?
    a. 21.95%
    b. 25.23%
    c. 29.67%
    d. 36.00%
    e. none of these

67. Compute the percentage by mass of carbon in a compound with the empirical formula C_2H_2O.
    a. 28.57%
    b. 40.00%
    c. 57.14%
    d. 80.00%
    e. none of these

68. In any sample of ammonia gas (NH_3), the atomic percentage of H is about
    a. 18%
    b. 25%
    c. 75%
    d. 82%
    e. none of these

70. A natural product isolated from corn was found to contain 40.00% carbon, 6.71% hydrogen and the rest oxygen. Determine the empirical formula for this compound.
    a. CH_2O
    b. CHO
    c. C_2H_2O
    d. C_2H_4O
    e. none of these

71. A 50.00-g sample of a compound is analyzed and found to contain 21.85 g of phosphorus and 28.15 g of oxygen. The empirical formula for this compound is
    a. PO_3
    b. P_2O
    c. P_2O_5
    d. P_3O_2
    e. none of these

73. An oxide of iron is heated in a stream of hydrogen gas until it is completely converted to metallic iron. Treatment of 6.752 g of the oxide yields 4.726 g of pure iron. The empirical formula for the oxide must be
    a. FeO
    b. FeO_2
    c. Fe_2O
    d. Fe_2O_3
    e. none of these

74. A 1.56 g sample of a hydrocarbon compound is burned completely in oxygen to give 5.14 g of CO_2 and 1.40 g of H_2O as the only products. What is the empirical formula for this hydrocarbon?
    a. CH_2
    b. C_2H_3
    c. C_3H_4
    d. C_4H_5
    e. none of these

75. If a compound has an empirical formula of CH_4N_2S, which of the following could <u>not</u> be the molar mass of the compound?
    a. 76.13 g mol^{-1}
    b. 152.3 g mol^{-1}
    c. 266.4 g mol^{-1}
    d. 609.0 g mol^{-1}
    e. Any of these could be the molar mass.

76. The empirical formula for a hydrocarbon is found to be CH_2. In a separate experiment, the molar mass is determined to be approximately 112 g mol^{-1}. The number of hydrogens in the molecular formula of the hydrocarbon is therefore
    a. 8
    b. 12
    c. 16
    d. 20
    e. none of these

77. Under certain conditions of temperature and pressure, 1.00 mole of any gas occupies a volume of 22.4 L. Thus, under these same conditions, 0.04465 mol of any gas will occupy a volume of
    a. 1.00 L
    b. 10.0 L
    c. 22.4 L
    d. 32.0 L
    e. none of these

12. How many molecules are present in 36.5 g of CO_2 (molar mass = 44.01 g/mol)?
    (a) 8.29×10^{-1} molecules
    (b) 5.00 molecules
    (c) 5.00×10^{23} molecules
    (d) 7.84×10^{23} molecules
    (e) None of the above

13. Nitrogen exists as molecules of formula N_2. All of the following statements are true but one. Which is *not* true?
    (a) 28 g of nitrogen contains 6.02×10^{23} molecules.
    (b) 14 g of nitrogen is a mole of nitrogen atoms.
    (c) One mole of nitrogen molecules weighs 14 g.
    (d) 6.02×10^{23} nitrogen atoms weigh 14 G.
    (e) None of the above

Chapter 2—Stoichiometry

1. Consider the unbalanced chemical equation, $F_2 + H_2O \rightarrow OF_2 + HF$. When the reaction is balanced with smallest integer coefficients, the coefficient for H_2O is
   a. 1
   b. 2
   c. 3
   d. 4
   e. none of these

2. Consider the unbalanced chemical equation, $Al(OH)_3 + H_2CO_3 \rightarrow Al_2(CO_3)_3 + H_2O$. When the reaction is balanced with smallest integer coefficients, the coefficient for H_2CO_3 is
   a. 1
   b. 2
   c. 3
   d. 5
   e. none of these

3. Consider the unbalanced chemical equation, $CaCO_3 + H_3PO_4 \rightarrow Ca_3(PO_4)_2 + CO_2 + H_2O$. When the reaction is balanced with smallest integer coefficients, the coefficient for CO_2 is
   a. 1
   b. 3
   c. 5
   d. 7
   e. none of these

4. Consider the unbalanced chemical equation for the complete combustion of butanoic acid ($C_4H_8O_2$): $C_4H_8O_2 + O_2 \rightarrow CO_2 + H_2O$. When the reaction is balanced using smallest integer coefficients, the coefficient for O_2 is
   a. 3
   b. 4
   c. 5
   d. 6
   e. none of these

5. Ammonia (NH_3) reacts with oxygen to produce nitrogen oxide (NO) and water. If this reaction is described with a balanced chemical equation using smallest integer coefficients, the coefficient for nitrogen oxide is
   a. 1
   b. 2
   c. 3
   d. 4
   e. none of these

6. Propene gas (C_3H_6) burns completely in oxygen to produce carbon dioxide and water as the only products. If this reaction is described with a balanced chemical equation using smallest integer coefficients, the coefficient for water is
   a. 1
   b. 3
   c. 6
   d. 9
   e. none of these

9. If the reaction, $K_2O_2(s) + H_2O(l) \rightarrow KOH(aq) + O_2(g)$, is balanced using smallest integer coefficients, and these coefficients are interpreted as moles, what is the total mass of the reactants?
   a. 128 g
   b. 146 g
   c. 238 g
   d. 256 g
   e. none of these

10. The complete combustion of gaseous ethane (C_2H_6) in oxygen yields just carbon dioxide and water. When this reaction is balanced using smallest integer coefficients, and these coefficients are interpreted as moles, what is the total mass of the reactants?
   a. 62 g
   b. 126 g
   c. 142 g
   d. 284 g
   e. none of these

13. In the balanced chemical reaction, $XeF_4(g) + 2\ H_2O(g) \rightarrow Xe(g) + 4\ HF(g) + O_2(g)$, what mass of water is required to react completely with 10.0 g of XeF_4?
   a. 0.87 g
   b. 1.20 g
   c. 1.74 g
   d. 2.40 g
   e. none of these

21. Consider the production of ammonia gas through the reaction of nitrogen with hydrogen as described by the balanced equation,

$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$

How much N_2 would be required to react completely with 1.50 mol of H_2?
a. 14.0 g
b. 28.0 g
c. 42.0 g
d. 126 g
e. none of these

22. Consider the production of ammonia gas through the reaction of nitrogen with hydrogen as described by the balanced equation,

$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$

How much NH_3 would be produced by the complete reaction of 8.91 g of H_2 with excess N_2?
a. 25.1 g
b. 50.2 g
c. 75.3 g
d. 100 g
e. none of these

23. Consider the production of ammonia gas through the reaction of nitrogen with hydrogen as described by the balanced equation,

$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$

If all gas volumes are measured under the same conditions of pressure and temperature, what volume of ammonia gas would be produced by the complete reaction of 40.0 L of nitrogen?
a. 20.0 L
b. 26.7 L
c. 40.0 L
d. 80.0 L
e. none of these

24. Consider the reaction between hydrogen sulfide gas (H_2S) and oxygen to produce sulfur dioxide gas (SO_2) and water according to the balanced equation,

$2\ H_2S(g) + 3\ O_2(g) \rightarrow 2\ SO_2(g) + 2\ H_2O(l)$.

All gas volumes are assumed to be measured under the same fixed conditions of temperature and pressure.

How much H_2S will be required to react completely with 6.11 g of O_2?

a. 2.71 g
b. 4.34 g
c. 6.51 g
d. 8.68 g
e. none of these

25. Consider the reaction between hydrogen sulfide gas (H_2S) and oxygen to produce sulfur dioxide gas (SO_2) and water according to the balanced equation,

$2\ H_2S(g) + 3\ O_2(g) \rightarrow 2\ SO_2(g) + 2\ H_2O(l)$.

All gas volumes are assumed to be measured under the same fixed conditions of temperature and pressure.

What volume of SO_2 can be produced from the complete reaction of 8.9 L of O_2?

a. 2.00 L
b. 3.00 L
c. 8.9 L
d. 13.4 L
e. none of these

26. Consider the reaction between hydrogen sulfide gas (H_2S) and oxygen to produce sulfur dioxide gas (SO_2) and water according to the balanced equation,

$2\ H_2S(g) + 3\ O_2(g) \rightarrow 2\ SO_2(g) + 2\ H_2O(l)$.

All gas volumes are assumed to be measured under the same fixed conditions of temperature and pressure.
If 2.50 L of H_2S and 3.00 L of O_2 are allowed to react completely, how much SO_2 will be produced?

a. 2.00 L
b. 2.50 L
c. 2.75 L
d. 3.00 L
e. none of these

27. Consider the reaction in which carbon disulfide (CS_2) is burned in oxygen to produce carbon dioxide and sulfur dioxide (SO_2) according to the balanced equation,

$CS_2(l) + 3\ O_2(g) \rightarrow CO_2(g) + 2\ SO_2(g)$

What is the least amount of CS_2 needed to produce 10.00 g of SO_2?

a. 2.971 g
b. 5.943 g
c. 11.89 g
d. 23.77 g
e. none of these

28. Consider the reaction in which carbon disulfide (CS_2) is burned in oxygen to produce carbon dioxide and sulfur dioxide (SO_2) according to the balanced equation,

$CS_2(l) + 3\ O_2(g) \rightarrow CO_2(g) + 2\ SO_2(g)$

How much CO_2 will be produced along with 10.00 g of SO_2?

a. 3.435 g
b. 6.870 g
c. 13.74 g
d. 27.48 g
e. none of these

29. Consider the reaction in which carbon disulfide (CS_2) is burned in oxygen to produce carbon dioxide and sulfur dioxide (SO_2) according to the balanced equation,

$CS_2(l) + 3\ O_2(g) \rightarrow CO_2(g) + 2\ SO_2(g)$

If 10.00 g of CS_2 reacts as far as possible with 15.00 g of O_2, how much SO_2 will be produced?

a. 8.414 g
b. 16.83 g
c. 20.02 g
d. 30.03 g
e. none of these

30. In the presence of gaseous hydrogen sulfide (H_2S) and oxygen, metallic silver is converted to silver sulfide (Ag_2S) according to the balanced equation,

    $4\ Ag(s) + 2\ H_2S(g) + O_2(g) \rightarrow 2\ Ag_2S(s) + 2\ H_2O(l)$.

    If 38.2 g of Ag is allowed to react with 5.60 g of H_2S and 3.00 g of O_2, which reactant will be the limiting reagent?
    a. Ag
    b. H_2S
    c. O_2
    d. all of these
    e. none of these

31. The gaseous elements H_2 and O_2 react explosively to form water (H_2O). 3.00 L of H_2 is mixed with 2.00 L of O_2 and the mixture is ignited in a strong steel vessel. If the gas volumes are all measured at the same temperature and pressure, which gas remains unreacted, and what is its volume?
    a. O_2, 0.50 L
    b. O_2, 1.00 L
    c. H_2, 1.00 L
    d. H_2, 2.00 L
    e. none of these

32. After a chemical reaction was completed, the product was carefully weighed and the mass recorded. In order to calculate the percentage yield for the reaction, what additional information is required?
    a. the theoretical yield of the product
    b. the actual yield of the product
    c. the molar mass of the product
    d. all of these
    e. none of these

33. A series of four sequential reactions is carried out during the synthesis of an organic compound. The percentage yields for the individual reactions are listed below.

Reaction Number	Percentage Yield
1	50%
2	19%
3	14%
4	16%

The overall yield for the synthesis is
a. 2.1×10^5%
b. 16 %
c. 0.21 %
d. 0.0021%
e. none of these

34. Consider the production of acetylene gas (C_2H_2) by the reaction of calcium carbide (CaC_2) with water as described in the balanced equation,

$$CaC_2(s) + 2\ H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$$

This reaction can be assumed to go as far toward completion as possible. Also, all gas volumes refer to conditions of temperature and pressure where one mole of gas occupies 22.4 L.

What volume of C_2H_2 will be produced by the complete reaction of 4.00 mol of CaC_2?
a. 5.60 L
b. 22.4 L
c. 44.8 L
d. 89.6 L
e. none of these

35. Consider the production of acetylene gas (C_2H_2) by the reaction of calcium carbide (CaC_2) with water as described in the balanced equation,

$$CaC_2(s) + 2\ H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$$

This reaction can be assumed to go as far toward completion as possible. Also, all gas volumes refer to conditions of temperature and pressure where one mole of gas occupies 22.4 L.

What mass of C_2H_2 will be produced by the complete reaction of 150.0 g of CaC_2?
a. 2.34 g
b. 11.23 g
c. 30.42 g
d. 60.93 g
e. none of these

36. Consider the production of acetylene gas (C_2H_2) by the reaction of calcium carbide (CaC_2) with water as described in the balanced equation,

$CaC_2(s) + 2\ H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$

This reaction can be assumed to go as far toward completion as possible. Also, all gas volumes refer to conditions of temperature and pressure where one mole of gas occupies 22.4 L.

What volume of C_2H_2 will be produced by the complete reaction of 28.5 g of CaC_2 with 10.00 g of water?

a. 0.445 L
b. 0.555 L
c. 6.22 L
d. 9.97 L
e. none of these

37. Consider the production of acetylene gas (C_2H_2) by the reaction of calcium carbide (CaC_2) with water as described in the balanced equation,

$CaC_2(s) + 2\ H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$

This reaction can be assumed to go as far toward completion as possible. Also, all gas volumes refer to conditions of temperature and pressure where one mole of gas occupies 22.4 L.

If 18.0 g of CaC_2 reacts to produce 0.200 mol of C_2H_2, the percentage yield of the reaction is

a. 36%
b. 58%
c. 80%
d. 90%
e. none of these

38. Consider the production of acetylene gas (C_2H_2) by the reaction of calcium carbide (CaC_2) with water as described in the balanced equation,

$CaC_2(s) + 2\ H_2O(l) \rightarrow Ca(OH)_2(s) + C_2H_2(g)$

This reaction can be assumed to go as far toward completion as possible. Also, all gas volumes refer to conditions of temperature and pressure where one mole of gas occupies 22.4 L.

If the percentage yield of C_2H_2 is <u>known</u> to be 80.0%, what volume of C_2H_2 is expected to be produced from 64.1 g of CaC_2?

a. 14.3 L
b. 17.9 L
c. 22.4 L
d. 28.0 L
e. none of these

42. What mass of potassium nitrate (KNO_3) is required to prepare 0.150 L of a 0.675 molar solution?
    a. 4.50 g
    b. 6.98 g
    c. 10.2 g
    d. 68.2 g
    e. none of these

43. The mass of barium nitrate $Ba(NO_3)_2$ needed to make 100 mL of a 0.10 m solution is about
    a. 2.0 g
    b. 2.6 g
    c. 20 g
    d. 26 g
    e. none of these

2. All but *on*e of the following statements about the burning of sulfur to form sulfur dioxide ("fire & brimstone") are *directly* indicated by the balanced equation:

   $S(s) + O_2(g) \rightarrow SO_2(g)$.

   Pick the *incorrect* statement:
   (a) One mole of sulfur combines with one mole of oxygen molecules.
   (b) One atom of sulfur reacts with two atoms of oxygen.
   (c) One gram of sulfur reacts with one gram of oxygen.
   (d) One mole of molecular oxygen reacts to form one mole of SO_2.
   (e) One liter of $O_2(g)$ will produce one liter of $SO_2(g)$ (at the same T, P).

3. Gaseous ammonia (NH_3) burns with oxygen gas (O_2) to form gaseous NO plus water vapor. The volume of oxygen required per volume of ammonia (at the same T and P) is:
   (a) 5
   (b) 4
   (c) 1.25
   (d) 1
   (e) 0.8

7. What is the molarity of a solution that contains 0.2922 grams of NaCl (molar mass = 58.44 g/mole) in 500.0 mL of solution?
   (a) 0.500 M
   (b) 0.200 M
   (c) 0.100 M
   (d) 0.0500 M
   (e) None of the above is correct.

Chapter 3—Lewis Structures

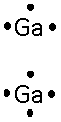
MULTIPLE CHOICE

1. The outermost electrons of an atom determine most of its chemistry, because those electrons are
   a. more negatively charged due to their distance from the center.
   b. more shielded from the effects of approaching atoms.
   c. more strongly affected when other atoms approach.
   d. All of these are correct.
   e. None of these is correct.

15. In which of the following atoms is the number of valence electrons equal to six?
   a. P
   b. Se
   c. Sb
   d. all of these
   e. none of these

16. In which of the following atoms is the number of valence electrons equal to three?
   a. Ge
   b. Sn
   c. Pb
   d. all of these
   e. none of these

17. In which of the following atoms is the number of core electrons equal to 54?
   a. Ba
   b. Ra
   c. Xe
   d. all of these
   e. none of these

19. Which of the following is the correct Lewis dot symbol for the gallium atom?
   a. 
   b. 
   c. 
   d.
   e. none of these

20. Which of the following is the correct Lewis dot symbol for the selenium atom?
   a. 
   b. 
   c. 
   d. 
   e. none of these

23. Which of the following is the correct Lewis dot symbol for the P^{2+} ion?

a. 

b. 

c. 

d. 

e. none of these

24. Which of the following is the correct Lewis dot symbol for the S^- ion?

a. 

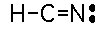
b. 

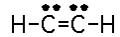
c. 

d. 

e. none of these

31. Which of the following Lewis structures contains an error?

a. 

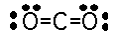
b. 

c. 

d. all of these
e. none of these

ANS: B

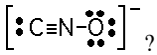
32. Which of the following Lewis structures contains an error?

a. 

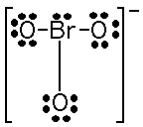
b. 

c. 

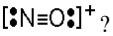
d. all of these
e. none of these

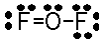
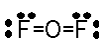
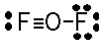
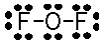
33. What is the formal charge on the nitrogen atom in the Lewis structure,  ?
    a. -2
    b. -1
    c. +1
    d. +2
    e. none of these

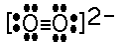
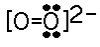
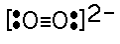
34. What is the formal charge on the bromine atom in the Lewis structure,



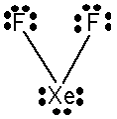
    a. +1
    b. +2
    c. +3
    d. +5
    e. none of these

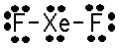
35. What is the formal charge on the nitrogen atom in the Lewis structure,  ?
    a. -1
    b. 0
    c. +1
    d. +2
    e. none of these

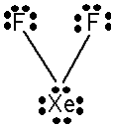
36. Which of the following is a correct Lewis dot structure for OF_2?
    a. 
    b. 
    c. 
    d. 
    e. none of these

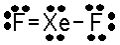
37. Which of the following is a correct Lewis dot structure for O_2^{2-}?
    a. 
    b. 
    c. 
    d. all of these
    e. none of these

38. Which of the following is a correct Lewis dot structure for XeF_2?

a. 

b. 

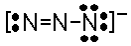
c. 

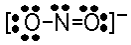
d. 

e. none of these

39. Which of the following Lewis structures can be drawn as two or more resonance forms?

a. 

b. 

c. 

d. all of these

e. none of these

40. Which of the following must have a Lewis dot structure that violates the octet rule?

a. NO_2

b. SO_2

c. CO_2

d. all of these

e. none of these

41. Which of the following will give a Lewis dot structure that violates the octet rule by having an octet-deficient central atom?

a. BeC_2

b. BCl_3

c. BeH_2

d. all of these

e. none of these

42. Which of the following must have a Lewis dot structure that violates the octet rule?

a. CF_4

b. SiF_4

c. SF_4

d. all of these

e. none of these