

## Chapter 2 Compounds and Chemical Reactions

### Multiple Choice

- Which one of the following elements exists as a diatomic molecule when it is in the free state?
  - H
  - He
  - Li
  - Be
  - B
  
- The number of atoms in one formula unit of the substance,  $\text{CO}(\text{NH}_2)_2$ , is
  - 4
  - 5
  - 6
  - 7
  - 8
  
- How many atoms are there in one formula unit of  $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ ?
  - 9
  - 14
  - 27
  - 28
  - 33
  
- Which one of the following compounds is correctly described as a hydrate?
  - $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$
  - $\text{HC}_2\text{H}_3\text{O}_2$
  - NaOH
  - $\text{CaH}_2$
  - $\text{C}_6\text{H}_{12}\text{O}_6$
  
- Which one of the following compounds is correctly described as a hydrate?
  - $\text{CaH}_2$
  - $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
  - $\text{H}_2\text{O}$
  - HCl
  - NaOH
  
- Which one of the following is correctly classified as a hydrocarbon?
  - $\text{C}_6\text{H}_{12}\text{O}_6$
  - $\text{C}_8\text{H}_{16}$
  - $\text{HC}_2\text{H}_3\text{O}_2$

- d. NaHCl
- e. C<sub>2</sub>H<sub>5</sub>OH

25. The common name for the compound, CH<sub>4</sub>, is

- a. carbon(IV) hydride
- b. carbon tetrahydride
- c. hydrocarbonate
- d. methane
- e. carbonic acid

27. What is the correct name for the compound IBr<sub>3</sub>?

- a. bromic iodide
- b. iodine bromate
- c. iodine tribromide
- d. iodine tribromine
- e. monoiodine tribromite

28. What is the correct name for the compound S<sub>2</sub>Cl<sub>2</sub>?

- a. disulfur chlorate
- b. disulfur dichloride
- c. disulfur dichlorine
- d. sulfur(I) chloride
- e. sulfur(II) chlorine(II)

29. What is the correct name for the compound HI(g)?

- a. hydriodic acid
- b. hydrogen monoiodide
- c. hydrogen iodide
- d. iodic acid
- e. monohydrogen monoiodide

30. What is the correct name for the compound HCN(g)?

- a. hydrocarbonitride
- b. hydrocyanic acid
- c. hydrogen carbonitride
- d. hydrogen cyanate
- e. hydrogen cyanide

31. A typographical error on an exam produced the formula, P<sub>4</sub>Se<sub>7</sub>, in one of the questions. How would you name this compound?

- a. tetraphosphorus hexaselenide
- b. tetraphosphorus heptaselenide
- c. phosphorus heptaselenite
- d. phosphorus(IV) selenide

e. phosphorus(VII) selenide

32. When barium metal reacts with chlorine gas it forms an ionic compound,  $\text{BaCl}_2$ . In the course of the reaction, each Ba atom
- loses two protons
  - loses two electrons
  - gains two protons
  - gains two electrons
  - loses two neutrons
33. When barium metal reacts with chlorine gas it forms an ionic compound,  $\text{BaCl}_2$ . In the course of the reaction, each Cl atom
- loses one proton
  - loses one electron
  - gains one proton
  - gains one electron
  - loses one neutron
34. An alkaline earth element, which we will represent by the symbol X, unites with a halogen, which we will represent by the symbol Q. What would be the correct formula of the resulting compound?
- XQ
  - $\text{XQ}_2$
  - $\text{XQ}_4$
  - $\text{X}_2\text{Q}$
  - $\text{X}_4\text{Q}$
35. Aluminum unites with a second element, which we will represent by the symbol E, to form a definite compound whose formula is  $\text{AlE}_3$ . Element E is most probably
- an actinide element
  - an alkali metal
  - a chalcogen
  - a halogen
  - a transition element
36. The correct formula for the compound formed between arsenic (As) and hydrogen is
- AsH
  - $\text{As}_2\text{H}$
  - $\text{AsH}_2$
  - $\text{As}_3\text{H}$
  - $\text{AsH}_3$
37. The correct formula for the compound formed between antimony(Sb) and hydrogen is
- SbH
  - $\text{SbH}_2$

- c.  $\text{SbH}_3$
- d.  $\text{SbH}_4$
- e.  $\text{SbH}_5$

38. Which one of the following formulas is incorrect because it does not represent a known ionic compound?

- a.  $\text{BaCl}_2$
- b.  $\text{Al}_2\text{F}_3$
- c.  $\text{NaO}_2$
- d.  $\text{RbBr}$
- e.  $\text{CaO}$

39. What is the correct name for the compound  $\text{V}_2\text{O}_5$ ? (Remember, for transition metals . . .)

- a. divanadium pentoxide
- b. vanadic oxide
- c. vanadium(V) oxide
- d. vanadium(V) pentoxide
- e. vanadous oxide

40. What is the correct name for the compound  $\text{NaCl}_3$ ?

- a. sodium chlorate
- b. sodium chlorite
- c. sodium perchloride
- d. sodium trichloride
- e. there is no such compound

41. What is the correct name for the compound  $\text{CuBr}_2$ ? (Remember, for transition metals . . .)

- a. copper(I) bromide(II)
- b. copper(II) bromide
- c. copper(II) bromite
- d. copper dibromide
- e. cuprous bromide

42. What is the correct name for the compound  $\text{Na}_2\text{O}$ ?

- a. disodium oxide
- b. sodium oxide
- c. sodium(I) oxide
- d. sodium peroxide
- e. sodium superoxide

43. Which one of the following is a correct name for the compound  $\text{FeBr}_3$ ?

- a. ferrous bromide
- b. iron(III) bromide
- c. iron bromite

- d. iron tribromide
- e. iron tribromine

44. Which one of the following is the correct formula for the compound ferrous sulfate?

- a.  $\text{FeSO}_4$
- b.  $\text{Fe}(\text{SO}_4)_2$
- c.  $\text{Fe}_2\text{SO}_4$
- d.  $\text{Fe}_2(\text{SO}_4)_3$
- e.  $\text{Fe}_3(\text{SO}_4)_2$

45. Which one of the following is a correct name for the compound  $\text{Hg}_2\text{Cl}_2$ ?

- a. dimercury dichloride
- b. mercuric chloride
- c. mercury(I) chloride
- d. mercury(II) dichloride
- e. there is no correct name, the formula should be  $\text{HgCl}$

46. Which one of the following is a correct formula for mercury(I) phosphate?

- a.  $\text{HgPO}_3$
- b.  $\text{HgPO}_4$
- c.  $\text{Hg}_3\text{PO}_4$
- d.  $\text{Hg}_2\text{PO}_3$
- e.  $(\text{Hg}_2)_3(\text{PO}_4)_2$

47. Which one of the following is a correct name for the compound  $\text{CoF}_3$ ?

- a. cobalt fluoride
- b. cobalt trifluoride
- c. cobaltic fluoride
- d. cobaltic trifluoride
- e. cobaltous fluoride

48. A correct name for the compound,  $\text{SnF}_4$ , would be

- a. stannic tetrafluoride
- b. stannous fluoride
- c. stannous(IV) fluoride
- d. tin(IV) fluoride
- e. tin tetrafluoride

49. A correct formula for stannous nitrate would be

- a.  $\text{Sn}(\text{NO}_2)_2$
- b.  $\text{Sn}(\text{NO}_3)_2$
- c.  $\text{Sn}(\text{NO}_3)_3$
- d.  $\text{Sn}(\text{NO}_3)_4$
- e.  $\text{Sn}_2\text{NO}_3$

50. What is the correct formula for the compound, magnesian chlorate?
- $\text{MgClO}_3$
  - $\text{Mg}(\text{ClO}_3)_2$
  - $\text{Mg}_2\text{ClO}_3$
  - $\text{MgO}(\text{ClO}_3)_2$
  - there is no such compound
51. What is the correct name for the compound  $\text{BaSeO}_3$ ?
- barium selenate
  - barium selenide
  - barium selenite
  - barium selenium trioxide
  - barium selenoxate
52. What is the correct name for the compound  $\text{Na}_2\text{Cr}_2\text{O}_7$ ?
- sodium chromium(VII)-ate
  - sodium dichromate
  - sodium dichromium heptaoxide
  - sodium heptaoxochromate
  - sodium perchromate
53. The compound  $\text{Na}_2\text{S}_2\text{O}_3$  is used extensively in photographic film processing. What is its chemical name?
- sodium bisulfite
  - sodium disulfur trioxide
  - sodium oxosulfate(IV)
  - sodium thiosulfate
  - sodium trioxosulfite
54. What is the correct name for the compound  $\text{Na}_2\text{Cr}_2\text{O}_7$ ?
- sodium chromate
  - disodium chromate
  - disodium bichromate
  - sodium dichromate
  - disodium dichromium heptaoxide
55. If the  $\text{NtO}_4^{2-}$  ion is called nortonate, what is the correct name for the compound  $\text{K}_2\text{NtO}_4$ ?
- dipotassium nortonium tetraoxide
  - dipotassium nortonate
  - potassium nortonate
  - potassium(I) nortonate
  - potassium(II) nortonate

56. What is the correct name for the compound  $\text{Cu}_2\text{SO}_3$ ?
- copper(I) sulfite
  - copper(II) sulfite
  - copper thiosulfate
  - cuprous sulfate
  - dicopper sulfur trioxide
66. The correct formula for the compound formed from strontium ion and chromate ion is
- $\text{SrCrO}_3$
  - $\text{SrCrO}_4$
  - $\text{Sr}_2\text{CrO}_4$
  - $\text{Sr}(\text{CrO}_4)_2$
  - $\text{Sr}_2(\text{CrO}_4)_3$
67. The correct formula for the phosphate ion is
- $\text{PO}_4^{2-}$
  - $\text{PO}_4^{3-}$
  - $\text{PO}_4^-$
  - $\text{P}_2\text{O}_4^-$
  - $\text{P}_2\text{O}_4^{2-}$
68. The correct formula for the carbonate ion is
- $\text{C}_2\text{H}_3\text{O}_2^-$
  - $\text{C}_2\text{O}_4^{2-}$
  - $\text{CO}_2^-$
  - $\text{CO}_3^-$
  - $\text{CO}_3^{2-}$
70. The correct formula for the compound formed from the magnesium ion and the chromate ion is
- $\text{MgCrO}_3$
  - $\text{MgCrO}_4$
  - $\text{Mg}_2\text{CrO}_4$
  - $\text{Mg}(\text{CrO}_4)_2$
  - $\text{Mg}_2(\text{CrO}_4)_3$
71. Which one of the following compounds is correctly described as a hydrate?
- $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$
  - $\text{HC}_2\text{H}_3\text{O}_2$
  - $\text{NaOH}$
  - $\text{CaH}_2$
  - $\text{C}_6\text{H}_{12}\text{O}_6$
75. The correct name for the compound  $\text{Al}(\text{SO}_4)_3$  is:

- a. there is no compound with that formula--it must be incorrectly written
- b. aluminum sulfate
- c. aluminum trisulfate
- d. aluminum(III) sulfate
- e. aluminum sulfite

76. Which one of the following is the correct name for the compound,  $V(NO_3)_3$ ?

- a. vanadium trinitrate
- b. vanadium nitrite
- c. vanadium(III) nitrite
- d. vanadium nitrate
- e. vanadium(III) nitrate

77. Which one of the following is the correct name for the compound,  $Ba(NO_3)_2$ ?

- a. barium dinitrate
- b. barium dinitrite
- c. barium nitrate
- d. barium(II) nitrite
- e. barium(II) nitrate