

Chemistry 8th edition Silberberg Test Bank

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Chapter 2 Test Bank

The Components of Matter

1. Kaolinite, a clay mineral with the formula $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$, is used as a filler in slick-paper for magazines and as a raw material for ceramics. Analysis shows that 14.35 g of kaolinite contains 8.009 g of oxygen. Calculate the mass percent of oxygen in kaolinite.

- A. 1.792 mass %
- B. 24.80 mass %
- C. 30.81 mass %
- D. 34.12 mass %
- E. 55.81 mass %**

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Theories

Topic: Components of Matter

2. Compound 1 has a composition of 46.7 mass % of element A and 53.3 mass % of element B. A and B also form a second binary compound (compound 2). If the compositions of the two compounds are consistent with the law of multiple proportions, which of the following compositions could be that of compound 2?

- A. 23.4 mass % A 76.6 mass % B
- B. 30.4 mass % A 69.6 mass % B**
- C. 33.3 mass % A 66.7 mass % B
- D. 53.3 mass % A 46.7 mass % B
- E. 73.3 mass % A 26.7 mass % B

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Atomic Theories

Topic: Components of Matter

3. What are the approximate carbon:hydrogen mass ratios in methane (CH_4) and ethyne (C_2H_2)?

- A. 1:4 and 1:1
- B. 3:2 and 6:1
- C. 3:1 and 12:1**
- D. 3:2 and 12:1
- E. 3:1 and 6:1

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Atomic Theories

Topic: Components of Matter

4. J. J. Thomson studied cathode ray particles (electrons) and was able to measure the mass/charge ratio. His results showed that

- A. the mass/charge ratio varied with as the cathode material was changed.
- B. the charge was always a whole-number multiple of some minimum charge.
- C. matter included particles much smaller than the atom.**
- D. atoms contained dense areas of positive charge.
- E. atoms are largely empty space.

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Structure of the Atom

Topic: Components of Matter

5. Who is credited with measuring the mass/charge ratio of the electron?

- A. Dalton
- B. Gay-Lussac
- C. Thomson**
- D. Millikan
- E. Rutherford

Accessibility: Keyboard Navigation

Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Structure of the Atom
Topic: Components of Matter

6. Who is credited with first measuring the charge of the electron?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Millikan**
- E. Rutherford

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Structure of the Atom
Topic: Components of Matter

7. Millikan's oil-drop experiment

- A. established the charge on an electron.**
- B. showed that all oil drops carried the same charge.
- C. provided support for the nuclear model of the atom.
- D. suggested that some oil drops carried fractional numbers of electrons.
- E. suggested the presence of a neutral particle in the atom.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Structure of the Atom
Topic: Components of Matter

8. In a Millikan oil-drop experiment, the charges on several different oil drops were as follows: -5.92 ; -4.44 ; -2.96 ; -8.88 . The units are arbitrary. What is the likely value of the electronic charge in these arbitrary units?

- A. -1.11
- B. -1.48**
- C. -2.22
- D. -2.96
- E. -5.55

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Structure of the Atom
Topic: Components of Matter

9. Who is credited with discovering the atomic nucleus?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Millikan
- E. Rutherford**

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Structure of the Atom
Topic: Components of Matter

10. Rutherford bombarded gold foil with alpha (α) particles and found that a small percentage of the particles were deflected. Which of the following was *not* accounted for by the model he proposed for the structure of atoms?

- A. the small size of the nucleus
- B. the charge on the nucleus
- C. the total mass of the atom**
- D. the existence of protons
- E. the presence of electrons outside the nucleus

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Structure of the Atom

Topic: Components of Matter

11. Which one of the following statements about atoms and subatomic particles is correct?

- A. Rutherford discovered the atomic nucleus by bombarding gold foil with electrons.
- B. The proton and the neutron have identical masses.
- C. The neutron's mass is equal to that of a proton plus an electron.
- D. A neutral atom contains equal numbers of protons and electrons.**
- E. An atomic nucleus contains equal numbers of protons and neutrons.

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Structure of the Atom

Topic: Components of Matter

12. The chemical symbol for potassium is

- A. P.
- B. Po.
- C. Pt.
- D. Pm.
- E. K.**

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes

Topic: Components of Matter

13. Which of the following symbols does not represent an element?

- A. O₂
- B. Co
- C. HF**
- D. Cs
- E. Xe

Accessibility: Keyboard Navigation

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes

Topic: Components of Matter

14. When an atom is represented by the symbol ${}^A_Z\text{X}$, the value of A is the

- A. number of neutrons in the atom.
- B. number of protons in the atom.
- C. atomic mass of the element.
- D. total number of electrons and neutrons in the atom.
- E. total number of protons and neutrons in the atom.**

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes

Topic: Components of Matter

15. An isotope of which of the following elements is chosen as a standard in measuring atomic mass?

- A. carbon**
- B. oxygen
- C. hydrogen
- D. neon
- E. helium

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

16. One amu is defined as

- A. the mass of a proton.
- B. 1/12 the mass of an atom of ${}^{12}\text{C}$.**

- C. the mass of an atom of ^1H .
- D. 1/20 the mass of an atom of ^{20}Ne .
- E. 1/16 the mass of an atom of ^{16}O .

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

17. Bromine is the only nonmetal that is a liquid at room temperature. Consider the isotope bromine-81, $^{81}_{35}\text{Br}$. Select the combination which lists the correct atomic number, neutron number, and mass number, respectively.

- A.** 35, 46, 81
- B. 35, 81, 46
- C. 81, 46, 35
- D. 46, 81, 35
- E. 35, 81, 116

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

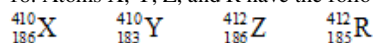
Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes

Topic: Components of Matter

18. Atoms X, Y, Z, and R have the following nuclear compositions:



Which two are isotopes?

- A. X & Y
- B. X & R
- C. Y & R
- D. Z & R
- E.** X & Z

Bloom's: 2. Understand

Difficulty: Easy

Gradable: automatic

Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes

Topic: Components of Matter

19. Lithium forms compounds which are used in dry cells and storage batteries and in high-temperature lubricants. It has two naturally occurring isotopes, ^6Li (isotopic mass = 6.015121 amu) and ^7Li (isotopic mass = 7.016003 amu). Lithium has an atomic mass of 6.9409 amu. What is the percent abundance of lithium-6?

- A. 92.50%
- B. 86.66%
- C. 46.16%
- D.** 7.503%
- E. 6.080%

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Hard

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

20. Silicon, which makes up about 25% of Earth's crust by mass, is used widely in the modern electronics industry. It has three naturally occurring isotopes, ^{28}Si , ^{29}Si , and ^{30}Si . Calculate the atomic mass of silicon.

Isotope	Isotopic Mass (amu)	Abundance %
^{28}Si	27.976927	92.23
^{29}Si	28.976495	4.67
^{30}Si	29.973770	3.10

- A. 29.2252 amu
- B. 28.9757 amu
- C. 28.7260 amu
- D.** 28.0855 amu
- E. 27.9801 amu

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

21. Bromine has two naturally-occurring isotopes. ^{79}Br has a mass of 78.9 amu and accounts for 50.3% of bromine atoms. If the atomic mass of bromine is 79.9 amu, what is the mass of an atom of the second bromine isotope?

- A. 77.9 amu
- B. 80.0 amu
- C. 80.1 amu
- D. 80.9 amu**
- E. 88.9 amu

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

22. In the modern periodic table, the order in which the elements are placed is based on

- A. atomic mass.
- B. mass number.
- C. atomic number.**
- D. atomic size.
- E. chemical reactivity.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

23. Which of the following elements are the least reactive?

- A. alkali metals
- B. noble gases**
- C. halogens
- D. alkaline earth metals
- E. metalloids

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

24. Which of the following is a nonmetal?

- A. lithium, Li, $Z = 3$
- B. bromine, Br, $Z = 35$**
- C. mercury, Hg, $Z = 80$
- D. bismuth, Bi, $Z = 83$
- E. sodium, Na, $Z = 11$

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

25. Which of the following is a metal?

- A. nitrogen, N, $Z = 7$
- B. phosphorus, P, $Z = 15$
- C. arsenic, $Z = 33$
- D. thallium, Tl, $Z = 81$**
- E. silicon, Si, $Z = 14$

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Elements and the Periodic Table

Topic: Components of Matter

26. Which of the following is a metalloid?

- A. carbon, C, $Z = 6$
- B. sulfur, S, $Z = 16$
- C. germanium, Ge, $Z = 32$**
- D. iridium, $Z = 77$
- E. bromine, Br, $Z = 35$

Accessibility: Keyboard Navigation

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

27. Which one of the following groups does not contain any metals?

- A. C, S, As, H**
- B. Cu, P, Se, Kr
- C. N, Ne, Nd, Np
- D. Xe, Hg, Ge, O
- E. Cl, Al, Si, Ar

Accessibility: Keyboard Navigation

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

28. A column of the periodic table is called a

- A. group.**
- B. period.
- C. isotopic mixture.
- D. pillar.
- E. shell.

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

29. A row of the periodic table is called a

- A. group.
- B. period.**
- C. isotopic mixture.
- D. family.
- E. subshell.

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Easy

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

30. What is the chemical symbol for the group 6A (16) element that lies in period 4?

- A. Cr
- B. Hf
- C. W
- D. Ti
- E. Se**

Accessibility: Keyboard Navigation

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Elements and the Periodic Table

Topic: Components of Matter

31. Which of the following compounds is ionic?

- A. PF_3
- B. CS_2**

- C. HCl
D. SO₂
E. MgCl₂

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

32. After an atom has lost an electron it becomes a/an _____ and has a _____ charge.
A. anion, positive
B. isotope, negative
C. anion, negative
D. cation, positive
E. nucleus, positive

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

33. Which of the following ions occurs commonly?
A. N³⁺
B. S⁶⁺
C. O²⁻
D. Ca⁺
E. Cl⁺

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

34. Which of the following ions occurs commonly?
A. P³⁺
B. Br⁷⁺
C. O⁶⁺
D. Ca²⁺
E. K⁻

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

35. Which of the following compounds is covalent?
A. CaCl₂
B. MgO
C. Al₂O₃
D. Cs₂S
E. PCl₃

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

36. Select the incorrect statement about elements and compounds.
A. All ionic compounds are neutral.
B. Some elements exist as molecules.
C. The bonding in compounds may be covalent or ionic.
D. The molecular formula of a compound provides more information than the structural formula.
E. Among the elements, there are more metals than nonmetals.

Accessibility: Keyboard Navigation

Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

37. Which, if any, of the following elements do not occur in the major classes of organic compounds?

- A. H
- B. C
- C. N
- D. O
- E. All of these choices are correct.**

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

38. Which of the following is the empirical formula for hexane, C_6H_{14} ?

- A. $C_{12}H_{28}$
- B. C_6H_{14}
- C. C_3H_7**
- D. $CH_{2.3}$
- E. $C_{0.43}H$

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

39. Sodium oxide combines violently with water. Which of the following gives the formula and the bonding for sodium oxide?

- A. NaO, ionic compound
- B. NaO, covalent compound
- C. Na_2O , ionic compound**
- D. Na_2O , covalent compound
- E. Na_2O_2 , ionic compound

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

40. Barium fluoride is used in embalming and in glass manufacturing. Which of the following gives the formula and bonding for barium fluoride?

- A. BaF_2 , ionic compound**
- B. BaF_2 , covalent compound
- C. BaF, ionic compound
- D. BaF, covalent compound
- E. Ba_2F , ionic compound

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

41. The colorless substance, MgF_2 , is used in the ceramics and glass industry. What is its name?

- A. magnesium difluoride
- B. magnesium fluoride**
- C. magnesium(II) fluoride
- D. monomagnesium difluoride
- E. None of these choices are correct

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature

Topic: Components of Matter

42. The compound, BaO, absorbs water and carbon dioxide readily and is used to dry gases and organic solvents. What is its name?

- A. barium oxide
- B. barium(II) oxide
- C. barium monoxide
- D. baric oxide
- E. barium peroxide

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

43. What is the name of Na₂O?

- A. disodium monoxide
- B. sodium monoxide
- C. sodium dioxide
- D. sodium(I) oxide
- E. sodium oxide

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

44. The substance, CaSe, is used in materials which are electron emitters. What is its name?

- A. calcium monoselenide
- B. calcium(II) selenide
- C. calcium selenide
- D. calcium(I) selenide
- E. calcium(II) selenium

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

45. The substance, CoCl₂, is useful as a humidity indicator because it changes from pale blue to pink as it gains water from moist air. What is its name?

- A. cobalt dichloride
- B. cobalt(II) chloride
- C. cobalt chloride
- D. cobaltic chloride
- E. copper(II) chloride

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

46. In the ionic compound with the general formula M₂X₃, the likely charge on X is

- A. +1.
- B. +3.
- C. -1.
- D. -2.
- E. -3.

Accessibility: Keyboard Navigation

Bloom's: 2. Understand

Difficulty: Medium

Gradable: automatic

Subtopic: Chemical Formulas

Topic: Components of Matter

47. Which one of the following combinations of names and formulas of ions is incorrect?

- A. O_2^- oxide
- B. Al^{3+} aluminum
- C. NO_3^- nitrate
- D. PO_4^{3-} phosphate
- E. CrO_4^{2-} chromate

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Molecules and Ions

Topic: Components of Matter

48. Which one of the following is a polyatomic cation?

- A. nitrate
- B. chromate
- C. permanganate
- D. hydronium
- E. potassium

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Molecules and Ions

Topic: Components of Matter

49. Which one of the following combinations of names and formulas of ions is incorrect?

- A. O^{2-} oxide
- B. Cd^{2+} cadmium
- C. ClO_3^- chlorate
- D. HCO_3^- hydrogen carbonate
- E. NO_2^- nitrate

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Molecules and Ions

Topic: Components of Matter

50. Which one of the following combinations of names and formulas of ions is incorrect?

- A. Ba^{2+} barium
- B. S^{2-} sulfate
- C. CN^- cyanide
- D. ClO_4^- perchlorate
- E. HCO_3^- bicarbonate

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Molecules and Ions

Topic: Components of Matter

51. Which one of the following combinations of names and formulas of ions is incorrect?

- A. NH_4^+ ammonium
- B. S^{2-} sulfide
- C. CN^- cyanide
- D. $\text{S}_2\text{O}_3^{2-}$ thiosulfate
- E. ClO_3^- perchlorate

Accessibility: Keyboard Navigation

Bloom's: 1. Remember

Difficulty: Medium

Gradable: automatic

Subtopic: Molecules and Ions

Topic: Components of Matter

52. A red glaze on porcelain can be produced by using MnSO_4 . What is its name?

- A. manganese disulfate
- B. manganese(II) sulfate
- C. manganese(IV) sulfate
- D. manganese sulfate
- E. manganese(I) sulfate

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

53. The compound, $(\text{NH}_4)_2\text{S}$, can be used in analysis for trace amounts of metals present in a sample. What is its name?

- A. ammonium sulfide
- B. diammonium sulfide
- C. ammonium sulfite
- D. ammonia(I) sulfite
- E. ammonium(I) sulfide

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

54. The substance, KClO_3 , is a strong oxidizer used in explosives, fireworks, and matches. What is its name?

- A. potassium chlorite
- B. potassium chloride
- C. potassium(I) chlorite
- D. potassium(I) chlorate
- E. potassium chlorate

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

55. The compound, NaH_2PO_4 , is present in many baking powders. What is its name?

- A. sodium biphosphate
- B. sodium hydrogen phosphate
- C. sodium dihydrogen phosphate
- D. sodium hydrophosphate
- E. sodium dihydride phosphate

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

56. Zinc acetate is used in preserving wood and in manufacturing glazes for porcelain. What is its formula?

- A. ZnAc_2
- B. ZnCH_3COO
- C. $\text{Zn}(\text{CH}_3\text{COO})_2$
- D. $\text{Zn}_2\text{CH}_3\text{COO}$
- E. $\text{ZnCH}_3\text{COCH}_3$

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

57. Silver chloride is used in photographic emulsions. What is its formula?

- A. Ag_2Cl_3
- B. Ag_2Cl
- C. AgCl_3
- D. AgCl_2
- E. AgCl

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature

Topic: Components of Matter

58. Barium sulfate is used in manufacturing photographic paper. What is its formula?

- A. BaSO₄
- B. Ba(SO₄)₂
- C. Ba₂SO₄
- D. Ba₂(SO₄)₃
- E. BaSO₃

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

59. Sodium peroxide is an oxidizer used to bleach animal and vegetable fibers. What is its formula?

- A. NaO
- B. NaO₂
- C. Na₂O₂
- D. Na₂O
- E. NaH₂O₂

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

60. What is the formula for magnesium sulfide?

- A. MgS
- B. MgS₂
- C. Mg₂S
- D. Mg₂S₃
- E. MgSO₄

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

61. Ferric oxide is used as a pigment in metal polishing. Which of the following is its formula?

- A. FeO
- B. Fe₂O
- C. FeO₃
- D. Fe₂O₅
- E. Fe₂O₃

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

62. What is the formula for lead (II) oxide?

- A. PbO
- B. PbO₂
- C. Pb₂O
- D. PbO₄
- E. Pb₂O₃

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

63. Potassium permanganate is a strong oxidizer that reacts explosively with easily oxidized materials. What is its formula?

- A. KMnO_3
- B. KMnO_4**
- C. K_2MnO_4
- D. $\text{K}(\text{MnO}_4)_2$
- E. $\text{K}_2\text{Mn}_2\text{O}_7$

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

64. Calcium hydroxide is used in mortar, plaster, and cement. What is its formula?

- A. CaOH
- B. CaOH_2
- C. Ca_2OH
- D. $\text{Ca}(\text{OH})_2$**
- E. CaHO_2

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

65. What is the formula for lithium nitrite?

- A. LiNO_2**
- B. Li_2NO_2
- C. LiNO_3
- D. Li_2NO_3
- E. LiNO_4

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

66. Iron (III) chloride hexahydrate is used as a coagulant for sewage and industrial wastes. What is its formula?

- A. $\text{Fe}(\text{Cl} \cdot 6\text{H}_2\text{O})_3$
- B. $\text{Fe}_3\text{Cl} \cdot 6\text{H}_2\text{O}$
- C. $\text{FeCl}_3(\text{H}_2\text{O})_6$
- D. $\text{Fe}_3\text{Cl}(\text{H}_2\text{O})_6$
- E. $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$**

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

67. Which one of the following formulas of ionic compounds is the least likely to be correct?

- A. NH_4Cl
- B. $\text{Ba}(\text{OH})_2$
- C. Na_2SO_4
- D. Ca_2NO_3**
- E. $\text{Cu}(\text{CN})_2$

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

68. Which one of the following formulas of ionic compounds is the least likely to be correct?

- A. CaCl_2
- B. NaSO_4**
- C. MgCO_3
- D. KF
- E. $\text{Cu}(\text{NO}_3)_2$

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

69. What is the name of the acid formed when H_2S gas is dissolved in water?

- A. sulfuric acid
- B. sulfurous acid
- C. hydrosulfuric acid**
- D. hydrosulfurous acid
- E. sulfidic acid

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

70. What is the name of the acid formed when HBr gas is dissolved in water?

- A. bromic acid
- B. bromous acid
- C. hydrobromic acid**
- D. hydrobromous acid
- E. hydrobromidic acid

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

71. What is the name of the acid formed when HClO_4 liquid is dissolved in water?

- A. hydrochloric acid
- B. perchloric acid**
- C. chloric acid
- D. chlorous acid
- E. hydrochlorate acid

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

72. What is the name of the acid formed when HCN gas is dissolved in water?

- A. cyanic acid
- B. hydrocyanic acid**
- C. cyanous acid
- D. hydrocyanous acid
- E. hydrogen cyanide

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

73. The name for $\text{HF}(\text{g})$ is

- A. hydrofluoric acid.
- B. hydrogen(I) fluoride.
- C. hydrogen fluoride.**
- D. hydrogen fluorine.
- E. fluoric acid.

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature

Topic: Components of Matter

74. Which one of the following combinations of names and formulas is incorrect?

- A. H_3PO_4 phosphoric acid
- B. HNO_3 nitric acid
- C. NaHCO_3 sodium carbonate
- D. H_2CO_3 carbonic acid
- E. KOH potassium hydroxide

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

75. What is the name of PCl_3 ?

- A. phosphorus chloride
- B. phosphoric chloride
- C. phosphorus trichlorate
- D. trichlorophosphide
- E. phosphorus trichloride

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Easy

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

76. The compound, P_4S_{10} , is used in the manufacture of safety matches. What is its name?

- A. phosphorus sulfide
- B. phosphoric sulfide
- C. phosphorus decasulfide
- D. tetraphosphorus decasulfide
- E. phosphorus pentasulfide

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

77. What is the name of BBr_3 ?

- A. boron bromide
- B. boric bromide
- C. boron tribromide
- D. tribromoboride
- E. bromine triboride

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

78. What is the name of IF_7 ?

- A. iodine fluoride
- B. iodic fluoride
- C. iodine heptafluoride
- D. heptafluoroiodide
- E. heptafluorine iodide

Accessibility: Keyboard Navigation

Bloom's: 3. Apply

Difficulty: Medium

Gradable: automatic

Subtopic: Nomenclature

Topic: Components of Matter

79. What is the name of P_4Se_3 ?

- A. phosphorus selenide
- B. phosphorus triselenide

- C. tetraphosphorus selenide
- D. phosphoric selenide
- E. tetraphosphorus triselenide**

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

80. Diiodine pentaoxide is used as an oxidizing agent that converts carbon monoxide to carbon dioxide. What is its chemical formula?

- A. I_2O_5**
- B. IO_5
- C. 2IO_5
- D. I_5O_2
- E. $(\text{IO}_5)_2$

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

81. Tetrasulfur dinitride decomposes explosively when heated. What is its formula?

- A. S_2N_4
- B. S_4N_2**
- C. 4SN_2
- D. S_4N
- E. S_2N

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

82. Chlorine dioxide is a strong oxidizer that is used for bleaching flour and textiles and for purification of water. What is its formula?

- A. $(\text{ClO})_2$
- B. Cl_2O
- C. Cl_2O_2
- D. Cl_2O_4
- E. ClO_2**

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

83. The formula of heptane is

- A. C_6H_{12} .
- B. C_6H_{14} .
- C. C_7H_{14} .
- D. C_7H_{16} .**
- E. C_8H_{16} .

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Nomenclature
Topic: Components of Matter

84. Ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, is a fertilizer widely used as a source of nitrogen. Calculate its molecular mass.

- A. 63.07 amu
- B. 114.10 amu
- C. 118.13 amu
- D. 128.11 amu
- E. 132.13 amu**

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

85. Sodium chromate is used to protect iron from corrosion and rusting. Determine its molecular mass.

- A. 261.97 amu
- B. 238.98 amu
- C. 161.97 amu**
- D. 138.98 amu
- E. 74.99 amu

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

86. Iodine pentafluoride reacts slowly with glass and violently with water. Determine its molecular mass.

- A. 653.52 amu
- B. 259.89 amu
- C. 221.90 amu**
- D. 202.90 amu
- E. 145.90 amu

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

87. Determine the molecular mass of iron (III) bromide hexahydrate, a substance used as a catalyst in organic reactions.

- A. 403.65 amu**
- B. 355.54 amu
- C. 317.61 amu
- D. 313.57 amu
- E. 295.56 amu

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

88. For each of the following elements, indicate whether it is a metal, a nonmetal, or a metalloid:

- a. S
 - **nonmetal**
 - metalloid
 - metal
- b. Ge
 - nonmetal
 - **metalloid**
 - metal
- c. Hg
 - nonmetal
 - metalloid
 - **metal**
- d. H
 - **nonmetal**
 - metalloid
 - metal

e. I

- **nonmetal**
- metalloid
- metal

f. Si

- nonmetal
- **metalloid**
- metal

Accessibility: Keyboard Navigation
 Bloom's: 2. Understand
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Elements and the Periodic Table
 Topic: Components of Matter

89. In nature, some elements exist as molecules, while others do not.

TRUE

Accessibility: Keyboard Navigation
 Bloom's: 1. Remember
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Elements and the Periodic Table
 Topic: Components of Matter

90. Modern studies have shown that the Law of Multiple Proportions is not valid.

FALSE

Accessibility: Keyboard Navigation
 Bloom's: 1. Remember
 Difficulty: Medium
 Gradable: automatic
 Subtopic: Atomic Theories
 Topic: Components of Matter

91. Atoms of one element cannot be converted to another element by any known method.

FALSE

Accessibility: Keyboard Navigation
 Bloom's: 1. Remember
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Atomic Theories
 Topic: Components of Matter

92. The mass of a neutron is equal to the mass of a proton plus the mass of an electron.

FALSE

Accessibility: Keyboard Navigation
 Bloom's: 1. Remember
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Structure of the Atom
 Topic: Components of Matter

93. All neutral atoms of tin have 50 protons and 50 electrons.

TRUE

Accessibility: Keyboard Navigation
 Bloom's: 2. Understand
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Structure of the Atom
 Topic: Components of Matter

94. Copper (Cu) is a transition metal.

TRUE

Accessibility: Keyboard Navigation
 Bloom's: 2. Understand
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Elements and the Periodic Table
 Topic: Components of Matter

95. Lead (Pb) is a main-group element.

TRUE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Elements and the Periodic Table
Topic: Components of Matter

96. Ionic compounds may carry a net positive or negative charge.

FALSE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

97. When an alkali metal combines with a non-metal, a covalent bond is normally formed.

FALSE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Molecules and Ions
Topic: Components of Matter

98. The molecular formula of a compound provides more information than its structural formula.

FALSE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

99. The formula C_9H_{20} is an empirical formula.

TRUE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Chemical Formulas
Topic: Components of Matter

100. Which of the following sets are isoelectronic (i.e., have the same number of electrons)?

- i. Br^- , Kr , Sr^{2+}
- ii. C , N^- , O^{2-}
- iii. Mg^{2+} , Ca^{2+} , Sr^{2+}
- iv. O^{2-} , O , O^{2+}
- v. Ag^+ , Cd^{2+} , Pd

- A. i and ii
- B. i and v**
- C. i, iii and iv
- D. ii, iii and v
- E. i, iii iv and v

Accessibility: Keyboard Navigation
Bloom's: 2. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes
Topic: Components of Matter

101. For the element bromine, the symbol, group number, group name and physical state are, respectively

- A. Bo , 17, noble gas, gas.
- B. B , 13, semimetal, solid.
- C. Br , 17, halogen, liquid.**
- D. Br , 17, halogen, gas.
- E. Br , 15, chalcogenide, gas.

Accessibility: Keyboard Navigation
 Bloom's: 2. Apply
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes
 Topic: Components of Matter

102. Which of the following has the most metallic character?

- A. Ge
- B. In**
- C. O
- D. P
- E. Sb

Accessibility: Keyboard Navigation
 Bloom's: 2. Understand
 Difficulty: Easy
 Gradable: automatic
 Subtopic: Elements and the Periodic Table
 Topic: Components of Matter

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