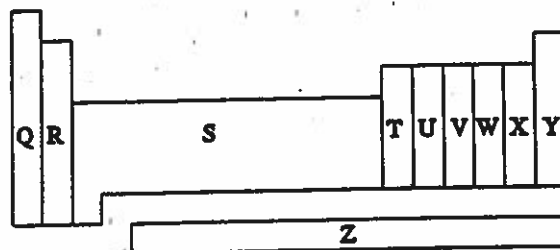


Project Advance Chemistry 106 Sample Questions
on Material in *General Chemistry, Brown, LeMay, and Bursten, 6th ed.*

Chapter 2. Atoms, Molecules, and Ions

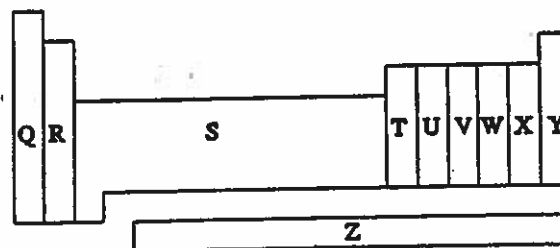
1. The most metallic elements would be found at the bottom of which group of the periodic table?

- (a) Q
- (b) R
- (c) W
- (d) X
- (e) Z



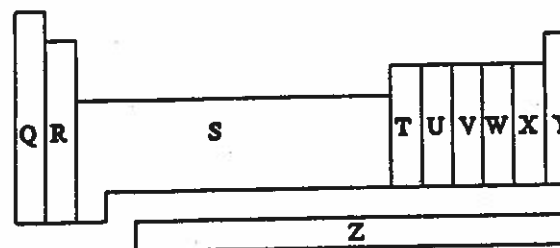
2. Which group of elements is most likely to form ions by gaining two electrons?

- (a) Q
- (b) R
- (c) W
- (d) X
- (e) Y



3. Which group of elements is most likely to form oxides with the general formula XO?

- (a) Q
- (b) R
- (c) W
- (d) X
- (e) Y



4. The basic chemical building block is considered the

- (a) cation
- (b) anion
- (c) atom
- (d) molecule
- (e) neutron

5. Which statement below correctly describes the responses of the three radiation types to an electric field?

- (a) both beta and gamma are bent in the same direction, while alpha shows no response.
- (b) both alpha and gamma are bent in the same direction, while beta shows no response.
- (c) both alpha and beta are bent in the same direction, while gamma shows no response.
- (d) alpha and beta are bent in opposite directions, while gamma shows no response.
- (e) only alpha is bent, while beta and gamma show no response.

6. An atom of the most common isotope of gold, ^{197}Au , has

- (a) 197 protons, 79 neutrons, and 118 electrons
- (b) 118 protons, 79 neutrons, and 39 electrons
- (c) 79 protons, 197 neutrons, and 197 electrons
- (d) 79 protons, 118 neutrons, and 118 electrons
- (e) 79 protons, 118 neutrons, and 79 electrons

7. Which species has 34 electrons?

- (a) $^{80}_{36}\text{Kr}$
- (b) $^{80}_{35}\text{Br}$
- (c) $^{78}_{34}\text{Se}$
- (d) $^{34}_{17}\text{Cl}$
- (e) none of these.

8. The periodic table predicts which pair of elements to be most alike in chemical properties?

- (a) C and O
- (b) B and As
- (c) I and Br
- (d) K and Kr
- (e) Cs and He

9. Which one of the following elements is a metalloid?

- (a) Mg
- (b) N
- (c) Al
- (d) C
- (e) Kr

10. Use the following information to identify the atom or ion.

	Mass Number	Protons	Neutrons	Electrons
(a) S^{2+}	16	8	8	10
(c) O^{2-}				
(e) Ar				

11. Which one of the following species has as many electrons as it has neutrons?

- (a) ^1H
- (b) $^{40}\text{Ca}^{2+}$
- (c) ^{14}C
- (d) $^{19}\text{F}^-$
- (e) $^{235}\text{U}^{3+}$

12. If the Thomson model of the atom had been correct, Rutherford would have observed

- (a) alpha particles going through the foil with little or no deflection.
- (b) alpha particles greatly deflected by the metal foil.
- (c) alpha particles bouncing off the foil.
- (d) positive particles formed in the foil.
- (e) None of the above observations is consistent with the Thomson model of the atom.

13. The correct formula of iron(III) bromide is

- (a) FeBr_2
- (b) FeBr_3
- (c) FeBr
- (d) Fe_3Br_3
- (e) Fe_3Br

14. Which combination of formula and charge is correct for the chromate ion?

- (a) CrO_4^{2-}
- (b) CrO_2^{3-}
- (c) CrO^-
- (d) CrO_3^{2-}
- (e) Cr^{3+}

15. Which one of the following is the correct name for $\text{Mg}(\text{ClO}_3)_2$?

- (a) magnesium chlorate
- (b) manganese chlorate
- (c) magnesium chloroxide
- (d) magnesium perchloride
- (e) none of these.

16. The elements Mg, Cl, and O combine to form a compound called magnesium chlorate, $\text{Mg}(\text{ClO}_3)_2$. What is the formula for the compound formed between Ca, Br, and O?

- (a) CaBrO_2
- (b) $\text{Ca}(\text{BrO}_3)_2$
- (c) $\text{Ca}(\text{BrO}_2)_3$
- (d) Ca_2BrO_3
- (e) none of these.

17. Which one of the following substances is perchloric acid?

- (a) HCl
- (b) HClO
- (c) HClO_3
- (d) HClO_2
- (e) HClO_4

18. What is the charge on the silver ion in Ag_2CO_3 ?

- (a) 3-
- (b) 2+
- (c) 1+
- (d) 3+
- (e) 1.5+

19. Which is the correct formula for the nitrite ion?

- (a) $\text{N}_2\text{O}_3^{2-}$ (b) NO_3^-
(c) NO_2^- (d) NO_3^{2-}
(e) NO_2^{2-}

20. For which of the following does the name *not agree* with the formula?

- (a) Cu_2CO_3 , copper(II) carbonate (b) P_2H_4 , diphosphorus tetrahydride
(c) AlN , aluminum nitride (d) $\text{HBr}(aq)$, hydrobromic acid
(e) HSO_3^- , bisulfite ion

21. Selenic acid is H_2SeO_4 . The formula for calcium selenite is

- (a) $\text{Ca}_2(\text{SeO}_4)_3$ (b) $\text{Ca}(\text{SeO}_3)_2$
(c) CaSeO_5 (d) CaSeO_3
(e) Ca_2SeO_2

22. Which of the following is (are) correct?

- I. sulfide S^{2-}
II. ammonium chloride NH_4Cl
III. acetic acid $\text{HC}_2\text{H}_3\text{O}_2$
IV. barium oxide BaO

- (a) all are correct (b) none is correct
(c) I and II are correct (d) III and IV are correct
(e) I, III, and IV are correct.

23. Which set contains only diatomic elements?

- I. silver, iron, lead, mercury
II. bromine, oxygen, fluorine, nitrogen
III. sodium, potassium, lithium, cesium

- (a) I (b) II
(c) III (d) all
(e) none

24. In which set do all the members have one-letter symbols?

- I. silver, iron, lead, mercury
II. bromine, oxygen, fluorine, nitrogen
III. sodium, potassium, lithium, cesium

- (a) I (b) II
(c) III (d) all
(e) none