

## Periodic Table Midterm Review

- The elements on the Periodic Table are arranged in order of increasing
  - atomic mass
  - atomic number
  - molar mass
  - oxidation number
- Which list includes elements with the most similar chemical properties?
  - Br, Ga, Hg
  - Cr, Pb, Xe
  - O, S, Se
  - N, O, F
- Which list of elements contains a metal, a metalloid, a nonmetal, and a noble gas?
  - Be, Si, Cl, Kr
  - C, N, Ne, Ar
  - K, Fe, B, F
  - Na, Zn, As, Sb
- Which statement identifies the element arsenic?
  - Arsenic has an atomic number of 33.
  - Arsenic has a melting point of 84 K.
  - An atom of arsenic in the ground state has eight valence electrons.
  - An atom of arsenic in the ground state has a radius of 146 pm.
- Which elements are malleable and good conductors of electricity?
  - iodine and silver
  - iodine and xenon
  - tin and silver
  - tin and xenon
- Which element has the highest melting point?
  - tantalum
  - rhenium
  - osmium
  - hafnium
- An element that has a low first ionization energy and good conductivity of heat and electricity is classified as a
  - metal
  - metalloid
  - nonmetal
  - noble gas
- Which two characteristics are associated with metals?
  - low first ionization energy and low electronegativity
  - low first ionization energy and high electronegativity
  - high first ionization energy and low electronegativity
  - high first ionization energy and high electronegativity
- Which substance can not be decomposed by ordinary chemical means?
  - methane
  - mercury
  - ethanol
  - ammonia
- Which element has properties of electrical conductivity and luster and exists as a liquid at STP?
  - Hg
  - Br
  - C
  - I
- At STP, which element is brittle and not a conductor of electricity?
  - S
  - K
  - Na
  - Ar
- What are two properties of most nonmetals?
  - high ionization energy and poor electrical conductivity
  - high ionization energy and good electrical conductivity
  - low ionization energy and poor electrical conductivity
  - low ionization energy and good electrical conductivity
- In which area of the Periodic Table are the elements with the strongest nonmetallic properties located?
  - lower left
  - upper left
  - lower right
  - upper right
- An atom of argon in the ground state tends not to bond with an atom of a different element because the argon atom has
  - more protons than neutrons
  - more neutrons than protons
  - a total of two valence electrons
  - a total of eight valence electrons
- An atom in the ground state has a stable valence electron configuration. This atom could be an atom of
  - Al
  - Cl
  - Na
  - Ne
- Which element has both metallic and nonmetallic properties?
  - Rb
  - Rn
  - Si
  - Sr
- Which isotopic notation identifies a metalloid that is matched with the corresponding number of protons in each of its atoms?
  - $^{24}\text{Mg}$  and 12 protons
  - $^{28}\text{Si}$  and 14 protons
  - $^{75}\text{As}$  and 75 protons
  - $^{80}\text{Br}$  and 80 protons
- Which Lewis electron-dot diagram represents a nitrogen atom in the ground state?
  - $\ddot{\text{N}}$
  - $\cdot\ddot{\text{N}}\cdot$
  - $\cdot\ddot{\text{N}}\cdot$
  - $:\ddot{\text{N}}:$

19. The two forms of oxygen,  $O_2(g)$  and  $O_3(g)$ , have

- A) different molecular structures and identical properties
- B) different molecular structures and different properties
- C) identical molecular structures and identical properties
- D) identical molecular structures and different properties

20. At STP, solid carbon can exist as graphite or as diamond. These two forms of carbon have

- A) the same properties and the same crystal structures
- B) the same properties and different crystal structures
- C) different properties and the same crystal structures
- D) different properties and different crystal structures

21. An atom in the ground state contains a total of 5 electrons, 5 protons, and 5 neutrons. Which Lewis electron-dot diagram represents this atom?

- A)  $\cdot\ddot{X}\cdot$     B)  $:\ddot{X}\cdot$     C)  $\ddot{X}\cdot$     D)  $:\ddot{X}:$

22. Which Lewis electron-dot diagram is correct for a  $S^{2-}$  ion?

- A)  $[\cdot\ddot{S}\cdot]^{2-}$     B)  $[\ddot{S}]^{2-}$   
C)  $[\ddot{S}]^{2-}$     D)  $[\ddot{S}]^{2-}$

23. What is the total number of valence electrons in a calcium atom in the ground state?

- A) 8    B) 2    C) 18    D) 20

24. In the formula  $X_2O_5$ , the symbol X could represent an element in Group

- A) 1    B) 2    C) 15    D) 18

25. Magnesium and calcium have similar chemical properties because an atom of each element has the same total number of

- A) electron shells    B) valence electrons
- C) neutrons    D) protons

26. What is the total number of electrons in a  $Mg^{2+}$  ion?

- A) 10    B) 12    C) 14    D) 24

27. Which set of properties is most characteristic of transition elements?

- A) colorless ions in solution, multiple positive oxidation states
- B) colorless ions in solution, multiple negative oxidation states
- C) colored ions in solution, multiple positive oxidation states
- D) colored ions in solution, multiple negative oxidation states

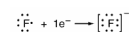
28. When an atom of lithium loses an electron, the atom becomes a

- A) negative ion with a radius smaller than the radius of the atom
- B) negative ion with a radius larger than the radius of the atom
- C) positive ion with a radius smaller than the radius of the atom
- D) positive ion with a radius larger than the radius of the atom

29. An atom of an element has a total of 12 electrons. An ion of the same element has a total of 10 electrons. Which statement describes the charge and radius of the ion?

- A) The ion is positively charged and its radius is smaller than the radius of the atom.
- B) The ion is positively charged and its radius is larger than the radius of the atom.
- C) The ion is negatively charged and its radius is smaller than the radius of the atom.
- D) The ion is negatively charged and its radius is larger than the radius of the atom.

30. Given the equation:



This equation represents the formation of a

- A) fluoride ion, which is smaller in radius than a fluorine atom
- B) fluoride ion, which is larger in radius than a fluorine atom
- C) fluorine atom, which is smaller in radius than a fluoride ion
- D) fluorine atom, which is larger in radius than a fluoride ion