Chemistry – Level 1 Self-Assessment Test

Thank you for your interest in the Chemistry 1 on-line class. As a pre-requisite for this class, you should be familiar with some of the concepts used in the problems below. Ideally, see if you can solve more than 50% of the problems below to be sure you have some foundation to build upon in this class.

1. How many oxygen atoms are in 225g O_2?
   (A) 4.23×10^{24}
   (B) 6.84×10^{24}
   (C) 8.47×10^{24}
   (D) 1.69×10^{25}

2. Which of these elements has the greatest electronegativity?
   (A) Br
   (B) N
   (C) O
   (D) S

3. Which element has an outer electron configuration of $s^2\ p^4$?
   (A) Ca
   (B) Cr
   (C) Ge
   (D) Se

4. An element is a solid at room temperature but soft enough to be cut with an ordinary knife. When placed in water this element reacts violently. Which element is it?
   (A) Na
   (B) Mg
   (C) Cu
   (D) Hg

5. The value of which property decreases with an increase in the strength of intermolecular forces?
   (A) viscosity
   (B) boiling point
   (C) surface tension
   (D) vapor pressure

6. Under which conditions will gas behave most ideally?
   (A) low P and high T
   (B) low P and low T
   (C) high P and low T
   (D) high P and high T

7. What is the conjugate base of HSO_4^-?
   (A) H^+
   (B) H_2SO_4
   (C) OH^-
   (D) SO_4^{2-}

8. Which statement is correct about a system at equilibrium?
   (A) The forward and reverse reactions occur at identical rates
   (B) The concentrations of reactants must equal the concentrations of the products
   (C) The concentrations of reactants and products can be changed by adding a catalyst
   (D) The concentrations of reactants and products are not affected by a change in temperature

9. Which statement is always true for an exothermic reaction?
   (A) The enthalpy change is negative
   (B) The entropy change is negative
   (C) The reaction absorbs heat from the surroundings
   (D) The reaction is spontaneous

10. Which equation represents the first ionization of calcium?
   (A) $Ca_{(s)} \rightarrow Ca^+_{(g)} + e^-$
   (B) $Ca_{(g)} \rightarrow Ca^+_{(g)} + e^-$
   (C) $Ca^+_{(g)} \rightarrow Ca^{2+}_{(g)} + e^-$
   (D) $Ca^{2+}_{(g)} \rightarrow e^- + Ca^+_{(g)}$

Answers:

1. C
2. C
3. D
4. A
5. D
6. A
7. D
8. A
9. A
10. B