Quizzes are not graded. The questions on this quiz are intended to illustrate the type of test questions that might be based Chapter 4 and the Nomenclature sheets that deal with acids and compounds of the transition metals.

1. **What is the net ionic equation that shows the result of mixing aqueous solutions of potassium chloride and magnesium nitrate?**

   a. \(2 \text{KCl} + \text{Mn(NO}_3\text{)_2} \rightarrow 2\text{KNO}_3 + \text{MnCl}_2\)  
   b. \(\text{Mg}^{2+} + 2\text{Cl}^- \rightarrow \text{MgCl}_2\)  
   c. \(\text{KCl} + \text{Mg(NO}_3\text{)_2} \rightarrow \text{NR}\)  
   d. \(\text{K}^+ + \text{NO}_2^- \rightarrow \text{KNO}_2\)

   Most chloride are soluble.  
   All nitrate ions are soluble.  
   All Group 2 salts are soluble.

2. **What is the net ionic equation that shows the result of mixing aqueous solutions of potassium hydroxide and hydrofluoric acid?**

   a. \(\text{KOH} + \text{HF} \rightarrow \text{NR}\)  
   b. \(\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}\)  
   c. \(\text{H}^+ + \text{F}^- \rightarrow \text{HF}\)  
   d. \(\text{HF} + \text{OH}^- \rightarrow \text{H}_2\text{O} + \text{F}^-\)

3. **Which equation corresponds to the formation of a gas when zinc is treated with hydrochloric acid?**

   a. \(\text{Zn} + 2\text{HCl} \rightarrow \text{ZnH}_2 + \text{Cl}_2\)  
   b. \(\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\)  
   c. \(\text{ZnO} + \text{H}_2\text{O} \rightarrow \text{Zn(OH)}_2 + \text{H}_2\)  
   d. \(\text{Zn} + 2\text{H}_2\text{O} \rightarrow \text{Zn(OH)}_2 + \text{H}_2\) with water.

4. **Which compounds are weak electrolytes?**

   a. \(\text{HCl}\)  
   b. \(\text{NaF}\)  
   c. \(\text{HF}\)  
   d. \(\text{LiOH}\)  
   e. \(\text{NH}_3\)  
   f. \(\text{CH}_3\text{OH}\)

   a. i., ii., and v. only  
   b. ii., iii., and v. only  
   c. ii., iv., and vi. only  
   d. i. and iv. only
5. Which molecule is not polar?

a. CS₂
b. H₂S

6. What are the formal charge and the oxidation number on the sulfur in the Lewis structure shown?

a. formal charge: 0
   oxidation number: +4
b. formal charge: −1
   oxidation number: +6
c. formal charge: +1
   oxidation number: +2
d. formal charge: +1
   oxidation number: +4

7. When the equation shown below is balanced with the smallest possible integral (whole number) coefficients, what is the coefficient of the iron(III) ion?

\[
\text{Cr}_2\text{O}_7^{2-} + a\text{Fe}^{2+} + b\text{H}^+ \rightarrow c\text{Cr}^{3+} + d\text{Fe}^{3+} + e\text{H}_2\text{O}
\]

\[\frac{4}{9} \frac{2}{9} \frac{6}{9} \frac{c}{9} \frac{d}{9} \frac{e}{9} \]

\[\text{Charge} \quad -2 + 2a + 14 = 6 + 3c\]

\[b = 0, \text{ } c = 6\]

8. Refer to the equation shown in Question 7. Suppose it took 20.00 mL of an iron(II) chloride solution to react completely with 10.00 mL of 0.1000 M potassium dichromate. What is the molarity of the iron(II) chloride solution?

a. 0.05000 M
b. 0.3000 M
c. 0.08333 M
d. 0.1500 M

\[\frac{1.000 \text{ mmol} \text{ Cr}_2\text{O}_7^{2-} \times \frac{6 \text{ mmol} \text{ Fe}^{2+}}{\text{mmol} \text{ Cr}_2\text{O}_7^{2-}} \times \frac{6.020 \text{ mmol} \text{ Fe}^{2+}}{20.00 \text{ mL}}}{10.00 \text{ mmol} \text{ Fe}^{2+}} = 0.3000 \text{ M} \]

9. Which compound contains phosphorus in the +5 oxidation state?

a. H₃PO₄
b. Na₃P
c. H₅PO₃
d. PH₃

\[3(1) + x + (1)(-3) = 0\]

\[x = +5\]