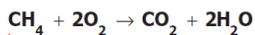


1. If 1.0 mole of methane reacts with oxygen to produce carbon dioxide and water, what mass of water is produced? #39

- A 16 grams  
B 18 grams  
C 36 grams  
D 44 grams



$$1 \text{ mol CH}_4 \mid 2 \text{ mol H}_2\text{O} \mid 18.02 \text{ g H}_2\text{O} = 36.04 \text{ g}$$

2. The number of molecules in 48.0 grams of oxygen gas is —

- F  $6.02 \times 10^{23}$   
G  $9.03 \times 10^{23}$   
H  $1.20 \times 10^{24}$   
J  $1.81 \times 10^{24}$

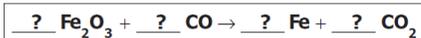
$$48 \text{ g O}_2 \mid 1 \text{ mol O}_2 \mid 6.02 \times 10^{23} \text{ molec O}_2$$

$$32 \text{ g} \mid 1 \text{ mol O}_2 = 9.03 \times 10^{23}$$

3. What are the coefficients of the correctly balanced equation?

- A 1, 3, 2, 3  
B 0, 2, 2, 3  
C 1, 2, 2, 2  
D 2, 6, 4, 3

#5



4. A chemist is examining an unidentified element sample with oxidation states of +2, +3, and +6. The element has a shielding effect similar to that of potassium (K).

Which statement about the unidentified element is most likely true?

- F It has the same number of neutrons as potassium.  
G It is a transition metal from the same period as potassium. #17  
H It is one of the heaviest elements in potassium's group.  
J It is a mix of three unstable isotopes of potassium.

5. One example of an ionic compound is —

- A)  $\text{F}_2$   
B)  $\text{CO}_2$   
C)  $\text{HBr}$   
D)  $\text{MgCl}_2$

Metal + Nonmetal  
#29

6. Hydrogen chloride is a covalent compound. Which is a correct Lewis dot structure for HCl? #33



7. Le Chatelier's principle describes what happens to a system in equilibrium when a stress occurs. All of the following could shift an equilibrium EXCEPT —

- A changing the pressure on the system #31  
B changing the temperature of the system  
C changing the identity of the catalyst  
D changing the concentration of one of the components

8. A mixture of gases with a pressure of 800 mm Hg contains 10% oxygen and 90% nitrogen by volume. What is the partial pressure of the oxygen gas in the mixture?

- F 10 mm Hg  
G 80 mm Hg #27  $(800)(.10) = 80$   
H 700 mm Hg  
J 800 mm Hg

9. The specific heat of aluminum is  $0.900 \text{ J/g} \cdot ^\circ\text{C}$ . How much heat is required to raise the temperature of a 30.0 g block of aluminum from  $25.0^\circ\text{C}$  to  $75.0^\circ\text{C}$ . #36

- A 0.540 J  
B 1.50 J  
C 1350 J  
D 1670 J

$$q = mc\Delta T$$

$$q = (30)(0.9)(75-25) = 1350 \text{ J}$$

10. What is the volume of the water in this graduated cylinder?

- F 4.39 mL #12  
G 4.41 mL  
H 4.55 mL  
J 5.61 mL

