

**AP MULTIPLE CHOICE QUESTIONS**  
**CH. 10, SET 2**

**1994**

59. When a 1.25 g sample of limestone was dissolved in acid, 0.44 g of  $\text{CO}_2$  was generated. If the rock contained no carbonate other than  $\text{CaCO}_3$ , what was the percent of  $\text{CaCO}_3$  by mass in the limestone?
- (A) 35% (D) 80%  
(B) 44% (E) 100%  
(C) 67%

64. At  $25^\circ\text{C}$ , a sample of  $\text{NH}_3$  (molar mass 17 g) effuses at the rate of 0.050 mole per minute. Under the same conditions, which of the following gases effuses at approximately one-half that rate?
- (A)  $\text{O}_2$  (molar mass 32 g)  
(B) He (molar mass 4.0 g)  
(C)  $\text{CO}_2$  (molar mass 44 g)  
(D)  $\text{Cl}_2$  (molar mass 71 g)  
(E)  $\text{CH}_4$  (molar mass 16 g)

**1989**

16. A gaseous mixture containing 7.0 moles of nitrogen, 2.5 moles of oxygen, and 0.50 moles of helium exerts a total pressure of 0.90 atmospheres. What is the partial pressure of the nitrogen?
- (A) 0.13 atm (D) 0.90 atm  
(B) 0.27 atm (E) 6.3 atm  
(C) 0.63 atm

30. Hydrogen gas is collected over water at  $24^\circ\text{C}$ . The total pressure of the sample is 755 millimeters of mercury. At  $24^\circ\text{C}$ , the vapor pressure of water is 22 millimeters of mercury. What is the partial pressure of the hydrogen gas?
- (A) 22 mm Hg (D) 760 mm Hg  
(B) 733 mm Hg (E) 777 mm Hg  
(C) 755 mm Hg

32. A 2.00-liter sample of nitrogen gas at  $27^\circ\text{C}$  and 600. millimeters of mercury is heated until it occupies a volume of 5.00 liters. If the pressure remains unchanged, the final temperature of the gas is
- (A)  $68^\circ\text{C}$  (D)  $677^\circ\text{C}$   
(B)  $120^\circ\text{C}$  (E)  $950^\circ\text{C}$   
(C)  $477^\circ\text{C}$

33. Which of the following conclusions can be drawn from J.J. Thomson's cathode-ray experiments?
- (A) Atoms contain electrons  
(B) Practically all the mass of an atom is contained in its nucleus.  
(C) Atoms contain protons, neutrons and electrons.  
(D) Atoms have a positively charged nucleus surrounded by an electron cloud.  
(E) No two electrons in one atom can have the same 4 quantum numbers.

42. The  $\text{SbCl}_5$  molecule has trigonal bipyramid structure. Therefore, the hybridization of Sb orbitals should be
- (A)  $sp^2$  (D)  $dsp^3$   
(B)  $sp^3$  (E)  $d^2sp^3$   
(C)  $dsp^2$

**1999**

44. A rigid metal tank contains oxygen gas. Which of the following applies to the gas in the tank when additional oxygen is added at constant temperature?
- (A) The volume of the gas increases.  
(B) The pressure of the gas decreases.  
(C) The average speed of the gas molecules remains the same.  
(D) The total number of gas molecules remains the same.  
(E) The average distance between the gas molecules increases.