

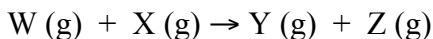
AP MULTIPLE CHOICE QUESTIONS
CH. 10, SET 3

1999



23. A hot-air balloon, shown above, rises. Which of the following is the best explanation for this phenomenon?
- (A) The pressure on the walls of the balloon increases with increasing temperature.
- (B) The difference in temperature between the air inside and outside the balloon produces convection currents.
- (C) The cooler air outside the balloon pushes in on the walls of the balloon.
- (D) The rate of diffusion of cooler air is less than that of warmer air.
- (E) The air density inside the balloon is less than that of the surrounding air.

53. Gases W and X react in a closed, rigid vessel to form gases Y and Z according to the equation below. The initial pressure of W (g) is 1.20 atm and that of X (g) is 1.60 atm. No Y (g) or Z (g) is initially present. The experiment is carried out at constant temperature. What is the partial pressure of Z (g) when the partial pressure of W (g) has decreased to 1.0 atm?



- (A) 0.20 atm (D) 1.2 atm
(B) 0.40 atm (E) 1.4 atm
(C) 1.0 atm



60. A 0.03 mol sample of $NH_4NO_3(s)$ is placed in a 1 L evacuated flask, which is then sealed and heated. The $NH_4NO_3(s)$ decomposes completely according to the balanced equation above. The total pressure in the flask measured at 400K is closest to which of the following? (The value of the gas constant, R, is $0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$)
- (A) 3 atm (D) 0.1 atm
(B) 1 atm (E) 0.03 atm
(C) 0.5 atm

64. Equal numbers of moles of He (g), Ar (g), and Ne (g) are placed in a glass vessel at room temperature. If the vessel has a pin-hole sized leak, which of the following will be true regarding the relative values of the partial pressures of the gases remaining in the vessel after some of the gas mixture has effused?
- (A) $P_{He} < P_{Ne} < P_{Ar}$
(B) $P_{He} < P_{Ar} < P_{Ne}$
(C) $P_{Ne} < P_{Ar} < P_{He}$
(D) $P_{Ar} < P_{He} < P_{Ne}$
(E) $P_{He} = P_{Ar} = P_{Ne}$
74. Which of the following gases deviates the most from ideal behavior?
- (A) SO_2 (D) N_2
(B) Ne (E) H_2
(C) CH_4