

10.1 Multiple-Choice and Bimodal Questions

1) A gas at a pressure of 10.0 Pa exerts a force of _____ N on an area of 5.5 m².

- A) 55
- B) 0.55
- C) 5.5
- D) 1.8
- E) 18

Answer: A

Diff: 2

Page Ref: Sec. 10.2

2) A gas at a pressure of 325 torr exerts a force of _____ N on an area of 5.5 m².

- A) 1.8×10^3
- B) 59
- C) 2.4×10^5
- D) 0.018
- E) 2.4

Answer: C

Diff: 2

Page Ref: Sec. 10.2

3) A pressure of 1.00 atm is the same as a pressure of _____ of mm Hg.

- A) 193
- B) 101
- C) 760.
- D) 29.9
- E) 33.0

Answer: C

Diff: 2

Page Ref: Sec. 10.2

4) The National Weather Service routinely supplies atmospheric pressure data to help pilots set their altimeters. The units the NWS uses for atmospheric pressure are inches of mercury. A barometric pressure of 30.51 inches of mercury corresponds to _____ kPa.

- A) 77.50
- B) 775.0
- C) 1.020
- D) 103.3
- E) 16.01

Answer: D

Diff: 2

Page Ref: Sec. 10.2

5) A closed-end manometer was attached to a vessel containing argon. The difference in the mercury levels in the two arms of the manometer was 12.2 cm. Atmospheric pressure was 783 mm Hg. The pressure of the argon in the container was _____ mm Hg.

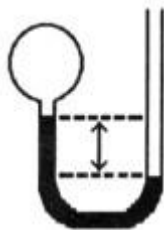
- A) 122
- B) 661
- C) 771
- D) 795
- E) 882

Answer: A

Diff: 2

Page Ref: Sec. 10.2

6) A gas vessel is attached to an open-end manometer containing a nonvolatile liquid of density 0.791 g/mL as shown below.



The difference in heights of the liquid in the two sides of the manometer is 43.4 cm when the atmospheric pressure is 755 mm Hg. Given that the density of mercury is 13.6 g/mL, the pressure of the enclosed gas is _____ atm.

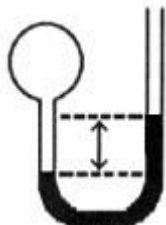
- A) 1.03
- B) 0.960
- C) 0.993
- D) 0.990
- E) 0.987

Answer: B

Diff: 3

Page Ref: Sec. 10.2

7) A gas vessel is attached to an open-end manometer filled with a nonvolatile liquid of density 0.993 g/mL as shown below.



The difference in heights of the liquid in the two sides of the manometer is 32.3 cm when the atmospheric pressure is 765 mm Hg. Given that the density of mercury is 13.6 g/mL, the pressure of the enclosed gas is _____ atm.

- A) 1.04
- B) 1.01
- C) 0.976
- D) 0.993
- E) 1.08

Answer: A

Diff: 3

Page Ref: Sec. 10.2

8) In a Torricelli barometer, a pressure of one atmosphere supports a 760 mm column of mercury. If the original tube containing the mercury is replaced with a tube having twice the diameter of the original, the height of the mercury column at one atmosphere pressure is _____ mm.

- A) 380
- B) 760
- C) 1.52×10^3
- D) 4.78×10^3
- E) 121

Answer: B

Diff: 3

Page Ref: Sec. 10.2

9) A sample of gas (24.2 g) initially at 4.00 atm was compressed from 8.00 L to 2.00 L at constant temperature. After the compression, the gas pressure was _____ atm.

- A) 4.00
- B) 2.00
- C) 1.00
- D) 8.00
- E) 16.0

Answer: E

Diff: 2

Page Ref: Sec. 10.3

10) A sample of a gas (5.0 mol) at 1.0 atm is expanded at constant temperature from 10 L to 15 L. The final pressure is _____ atm.

- A) 1.5
- B) 7.5
- C) 0.67
- D) 3.3
- E) 15

Answer: C

Diff: 2

Page Ref: Sec. 10.3

11) A balloon originally had a volume of 4.39 L at 44 °C and a pressure of 729 torr. The balloon must be cooled to _____ °C to reduce its volume to 3.78 L (at constant pressure).

- A) 38
- B) 0
- C) 72.9
- D) 273
- E) 546

Answer: B

Diff: 2

Page Ref: Sec. 10.3

12) If 3.21 mol of a gas occupies 56.2 L at 44 °C and 793 torr, 5.29 mol of this gas occupies _____ L under these conditions.

- A) 14.7
- B) 61.7
- C) 30.9
- D) 92.6
- E) 478

Answer: D

Diff: 2

Page Ref: Sec. 10.3

13) A gas originally at 27 °C and 1.00 atm pressure in a 3.9 L flask is cooled at constant pressure until the temperature is 11 °C. The new volume of the gas is _____ L.

- A) 0.27
- B) 3.7
- C) 3.9
- D) 4.1
- E) 0.24

Answer: B

Diff: 2

Page Ref: Sec. 10.3

14) If 50.75 g of a gas occupies 10.0 L at STP, 129.3 g of the gas will occupy _____ L at STP.

- A) 3.92
- B) 50.8
- C) 12.9
- D) 25.5
- E) 5.08

Answer: D

Diff: 2

Page Ref: Sec. 10.3

15) A sample of He gas (2.35 mol) occupies 57.9 L at 300.0 K and 1.00 atm. The volume of this sample is _____ L at 423 K and 1.00 atm.

- A) 0.709
- B) 41.1
- C) 81.6
- D) 1.41
- E) 57.9

Answer: C

Diff: 2

Page Ref: Sec. 10.3

16) A sample of H₂ gas (12.28 g) occupies 100.0 L at 400.0 K and 2.00 atm. A sample weighing 9.49 g occupies _____ L at 353 K and 2.00 atm.

- A) 109
- B) 68.2
- C) 54.7
- D) 147
- E) 77.3

Answer: B

Diff: 2

Page Ref: Sec. 10.3

17) A sample of an ideal gas (3.00 L) in a closed container at 25.0 °C and 76.0 torr is heated to 300 °C. The pressure of the gas at this temperature is _____ torr.

- A) 912
- B) 146
- C) 76.5
- D) 39.5
- E) 2.53×10^{-2}

Answer: B

Diff: 3

Page Ref: Sec. 10.3

18) A sample of a gas (1.50 mol) is contained in a 15.0 L cylinder. The temperature is increased from 100 °C to 150 °C. The ratio of final pressure to initial pressure $\left[\frac{P_2}{P_1}\right]$ is _____.

- A) 1.50
- B) 0.667
- C) 0.882
- D) 1.13
- E) 1.00

Answer: D

Diff: 3

Page Ref: Sec. 10.3

19) A sample of a gas originally at 25 °C and 1.00 atm pressure in a 2.5 L container is allowed to expand until the pressure is 0.85 atm and the temperature is 15 °C. The final volume of the gas is _____ L.

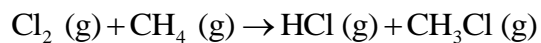
- A) 3.0
- B) 2.8
- C) 2.6
- D) 2.1
- E) 0.38

Answer: B

Diff: 3

Page Ref: Sec. 10.3

20) The reaction of 50 mL of Cl_2 gas with 50 mL of CH_4 gas via the equation:



will produce a total of _____ mL of products if pressure and temperature are kept constant.

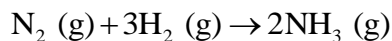
- A) 100
- B) 50
- C) 200
- D) 150
- E) 250

Answer: A

Diff: 3

Page Ref: Sec. 10.3

21) The reaction of 50 mL of N_2 gas with 150 mL of H_2 gas to form ammonia via the equation:



will produce _____ mL of ammonia if pressure and temperature are kept constant.

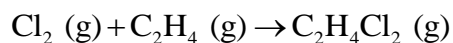
- A) 250
- B) 50
- C) 200
- D) 150
- E) 100

Answer: E

Diff: 3

Page Ref: Sec. 10.3

22) The reaction of 50 mL of Cl_2 gas with 50 mL of CH_4 gas via the equation:



will produce a total of _____ mL of products if pressure and temperature are kept constant.

- A) 100
- B) 50
- C) 25
- D) 125
- E) 150

Answer: B

Diff: 4

Page Ref: Sec. 10.3

23) The amount of gas that occupies 60.82 L at 31°C and 367 mm Hg is _____ mol.

- A) 1.18
- B) 0.850
- C) 894
- D) 11.6
- E) 0.120

Answer: A

Diff: 2

Page Ref: Sec. 10.4

24) The pressure of a sample of CH_4 gas (6.022 g) in a 30.0 L vessel at 402 K is _____ atm.

- A) 2.42
- B) 6.62
- C) 0.413
- D) 12.4
- E) 22.4

Answer: C

Diff: 3

Page Ref: Sec. 10.4

Chemistry, 11e (Brown/LeMay/Brusten/Murphy)
Chapter 10: Gases

25) At a temperature of _____ °C, 0.444 mol of CO gas occupies 11.8 L at 889 torr.

- A) 379
- B) 73
- C) 14
- D) 32
- E) 106

Answer: E

Diff: 3

Page Ref: Sec. 10.4

26) The volume of 0.25 mol of a gas at 72.7 kPa and 15 °C is _____ m³.

- A) 8.1×10^{-5}
- B) 1.2×10^{-4}
- C) 4.3×10^{-4}
- D) 8.2×10^{-3}
- E) 2.2×10^{-1}

Answer: D

Diff: 3

Page Ref: Sec. 10.4

27) The pressure exerted by 1.3 mol of gas in a 13 L flask at 22 °C is _____ kPa.

- A) 560
- B) 250
- C) 18
- D) 2.4
- E) 1.0

Answer: B

Diff: 3

Page Ref: Sec. 10.4

28) A 0.325 L flask filled with gas at 0.914 atm and 19 °C contains _____ mol of gas.

- A) 1.24×10^{-2}
- B) 1.48×10^{-2}
- C) 9.42
- D) 12.4
- E) 80.7

Answer: A

Diff: 2

Page Ref: Sec. 10.4

29) A gas in a 325 mL container has a pressure of 695 torr at 19 °C. There are _____ mol of gas in the flask.

- A) 1.24×10^{-2}
- B) 1.48×10^{-2}
- C) 9.42
- D) 12.4
- E) 80.6

Answer: A

Diff: 2

Page Ref: Sec. 10.4

30) A sample of gas (1.9 mol) is in a flask at 21 °C and 697 mm Hg. The flask is opened and more gas is added to the flask. The new pressure is 795 mm Hg and the temperature is now 26 °C. There are now _____ mol of gas in the flask.

- A) 1.6
- B) 2.1
- C) 2.9
- D) 3.5
- E) 0.28

Answer: B

Diff: 5

Page Ref: Sec. 10.4

31) A sample of gas (1.3 mol) occupies _____ L at 22 °C and 2.5 atm.

- A) 0.079
- B) 0.94
- C) 13
- D) 31
- E) 3.2×10^{-2}

Answer: C

Diff: 2

Page Ref: Sec. 10.4

32) The volume of 0.65 mol of an ideal gas at 365 torr and 97 °C is _____ L.

- A) 0.054
- B) 9.5
- C) 11
- D) 41
- E) 2.4×10^{-2}

Answer: D

Diff: 2

Page Ref: Sec. 10.4

33) The volume occupied by 1.5 mol of gas at 35 °C and 2.0 atm pressure is _____ L.

- A) 38
- B) 19
- C) 2.2
- D) 0.053
- E) 0.026

Answer: B

Diff: 2

Page Ref: Sec. 10.4

34) The mass of nitrogen dioxide contained in a 4.32 L vessel at 48 °C and 141600 Pa is _____ g.

- A) 5.35×10^4
- B) 53.5
- C) 10.5
- D) 70.5
- E) 9.46×10^{-2}

Answer: C

Diff: 3

Page Ref: Sec. 10.4

35) The density of ammonia gas in a 4.32 L container at 837 torr and 45.0 °C is _____ g/L.

- A) 3.86
- B) 0.719
- C) 0.432
- D) 0.194
- E) 4.22×10^{-2}

Answer: B

Diff: 3

Page Ref: Sec. 10.5

36) The density of N_2O at 1.53 atm and 45.2 °C is _____ g/L.

- A) 18.2
- B) 1.76
- C) 0.388
- D) 9.99
- E) 2.58

Answer: E

Diff: 3

Page Ref: Sec. 10.5

37) The molecular weight of a gas is _____ g/mol if 3.5 g of the gas occupies 2.1 L at STP.

- A) 41
- B) 5.5×10^3
- C) 37
- D) 4.6×10^2
- E) 2.7×10^{-2}

Answer: C

Diff: 3

Page Ref: Sec. 10.5

38) The molecular weight of a gas that has a density of 6.70 g/L at STP is _____ g/mol.

- A) 4.96×10^2
- B) 1.50×10^2
- C) 7.30×10^1
- D) 3.35
- E) 2.98×10^{-1}

Answer: B

Diff: 3

Page Ref: Sec. 10.5

39) The molecular weight of a gas that has a density of 7.10 g/L at 25.0 °C and 1.00 atm pressure is _____ g/mol.

- A) 174
- B) 14.6
- C) 28.0
- D) 5.75×10^{-3}
- E) 6.85×10^{-2}

Answer: A

Diff: 3

Page Ref: Sec. 10.5

40) The molecular weight of a gas that has a density of 5.75 g/L at STP is _____ g/mol.

- A) 3.90
- B) 129
- C) 141
- D) 578
- E) 1.73×10^{-3}

Answer: B

Diff: 3

Page Ref: Sec. 10.5

41) The density of chlorine (Cl_2) gas at 25 °C and 60. kPa is _____ g/L.

- A) 20
- B) 4.9
- C) 1.7
- D) 0.86
- E) 0.58

Answer: C

Diff: 4

Page Ref: Sec. 10.5

42) The volume of hydrogen gas at 38.0 °C and 763 torr that can be produced by the reaction of 4.33 g of zinc with excess sulfuric acid is _____ L.

- A) 1.68
- B) 2.71×10^{-4}
- C) 3.69×10^4
- D) 2.84
- E) 0.592

Answer: A

Diff: 4

Page Ref: Sec. 10.5

43) The volume of HCL gas required to react with excess magnesium metal to produce 6.82 L of hydrogen gas at 2.19 atm and 35.0 °C is _____ L.

- A) 6.82
- B) 2.19
- C) 13.6
- D) 4.38
- E) 3.41

Answer: C

Diff: 3

Page Ref: Sec. 10.5

44) The volume of fluorine gas required to react with 2.67 g of calcium bromide to form calcium fluoride and bromine at 41.0 °C and 4.31 atm is _____ mL.

- A) 10.4
- B) 210
- C) 420
- D) 79.9
- E) 104

Answer: D

Diff: 4

Page Ref: Sec. 10.5

45) What volume (mL) of sulfur dioxide can be produced by the complete reaction of 3.82 g of calcium sulfite with excess HCL(aq), when the final SO₂ pressure is 827 torr at 44.0 °C?

- A) 7.60×10^2
- B) 1.39×10^{-4}
- C) 1.00×10^{-3}
- D) 0.106
- E) 5.78×10^2

Answer: A

Diff: 4

Page Ref: Sec. 10.5

46) Automobile air bags use the decomposition of sodium azide as their source of gas for rapid inflation:



What mass (g) of NaN_3 is required to provide 40.0 L of N_2 at 25.0 °C and 763 torr?

- A) 1.64
- B) 1.09
- C) 160
- D) 71.1
- E) 107

Answer: D

Diff: 4

Page Ref: Sec. 10.5

47) The Mond process produces pure nickel metal via the thermal decomposition of nickel tetracarbonyl:



What volume (L) of CO is formed from the complete decomposition of 444 g of $\text{Ni}(\text{CO})_4$ at 752 torr and 22.0 °C?

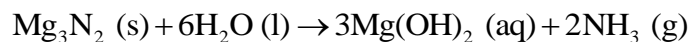
- A) 0.356
- B) 63.7
- C) 255
- D) 20.2
- E) 11.0

Answer: C

Diff: 4

Page Ref: Sec. 10.5

48) What volume (L) of NH_3 gas at STP is produced by the complete reaction of 7.5 g of H_2O according to the following reaction?



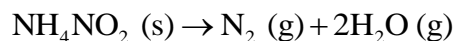
- A) 3.1
- B) 9.3
- C) 19
- D) 28
- E) 0.32

Answer: A

Diff: 4

Page Ref: Sec. 10.5

49) Ammonium nitrite undergoes thermal decomposition to produce only gases:



What volume (L) of gas is produced by the decomposition of 35.0 g of NH_4NO_2 (s) at 525 °C and 1.5 atm?

- A) 47
- B) 160
- C) 15
- D) 72
- E) 24

Answer: D

Diff: 4

Page Ref: Sec. 10.5

50) The thermal decomposition of potassium chlorate can be used to produce oxygen in the laboratory.



What volume (L) of O_2 gas at 25°C and 1.00 atm pressure is produced by the decomposition of 7.5 g of KClO_3 (s)?

- A) 4.5
- B) 7.5
- C) 2.2
- D) 3.7
- E) 11

Answer: C

Diff: 4

Page Ref: Sec. 10.5

51) Since air is a mixture, it does not have a "molar mass." However, for calculation purposes, it is possible to speak of its "effective molar mass." (An effective molar mass is a weighted average of the molar masses of a mixture's components.) If air at STP has a density of 1.285 g/L, its effective molar mass is _____ g/mol.

- A) 26.94
- B) 31.49
- C) 30.00
- D) 34.42
- E) 28.80

Answer: E

Diff: 4

Page Ref: Sec. 10.5

52) A vessel contained N_2 , Ar, He, and Ne. The total pressure in the vessel was 987 torr. The partial pressures of nitrogen, argon, and helium were 44.0, 486, and 218 torr, respectively. The partial pressure of neon in the vessel was _____ torr.

- A) 42.4
- B) 521
- C) 19.4
- D) 239
- E) 760

Answer: D

Diff: 2

Page Ref: Sec. 10.6

53) The pressure in a 12.2 L vessel that contains 2.34 g of carbon dioxide, 1.73 g of sulfur dioxide, and 3.33 g of argon, all at 42 °C is _____ mm Hg.

- A) 263
- B) 134
- C) 395
- D) 116
- E) 0.347

Answer: A

Diff: 3

Page Ref: Sec. 10.6

54) A sample of He gas (3.0 L) at 5.6 atm and 25 °C was combined with 4.5 L of Ne gas at 3.6 atm and 25 °C at constant temperature in a 9.0 L flask. The total pressure in the flask was _____ atm. Assume the initial pressure in the flask was 0.00 atm and the temperature upon mixing was 25 °C.

- A) 2.6
- B) 9.2
- C) 1.0
- D) 3.7
- E) 24

Answer: D

Diff: 3

Page Ref: Sec. 10.6

55) A sample of H_2 gas (2.0 L) at 3.5 atm was combined with 1.5 L of N_2 gas at 2.6 atm pressure at a constant temperature of 25°C into a 7.0 L flask. The total pressure in the flask is _____ atm. Assume the initial pressure in the flask was 0.00 atm and the temperature upon mixing was 25°C .

- A) 0.56
- B) 2.8
- C) 1.0
- D) 1.6
- E) 24

Answer: D

Diff: 3

Page Ref: Sec. 10.6

56) In a gas mixture of He, Ne, and Ar with a total pressure of 8.40 atm, the mole fraction of Ar is _____ if the partial pressures of He and Ne are 1.50 and 2.00 atm, respectively.

- A) 0.179
- B) 0.238
- C) 0.357
- D) 0.583
- E) 0.417

Answer: D

Diff: 3

Page Ref: Sec. 10.6

57) A gas mixture of Ne and Ar has a total pressure of 4.00 atm and contains 16.0 mol of gas. If the partial pressure of Ne is 2.75 atm, how many moles of Ar are in the mixture?

- A) 11.0
- B) 5.00
- C) 6.75
- D) 9.25
- E) 12.0

Answer: B

Diff: 2

Page Ref: Sec. 10.6

58) A mixture of He and Ne at a total pressure of 0.95 atm is found to contain 0.32 mol of He and 0.56 mol of Ne. The partial pressure of Ne is _____ atm.

- A) 1.7
- B) 1.5
- C) 0.60
- D) 0.35
- E) 1.0

Answer: C

Diff: 2

Page Ref: Sec. 10.6

59) A flask contains a mixture of He and Ne at a total pressure of 2.6 atm. There are 2.0 mol of He and 5.0 mol of Ne in the flask. The partial pressure of He is _____ atm.

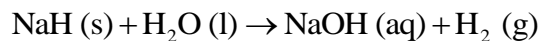
- A) 9.1
- B) 6.5
- C) 1.04
- D) 0.74
- E) 1.86

Answer: D

Diff: 2

Page Ref: Sec. 10.6

60) Sodium hydride reacts with excess water to produce aqueous sodium hydroxide and hydrogen gas:



A sample of NaH weighing _____ g will produce 982 mL of gas at 28.0 °C and 765 torr, when the hydrogen is collected over water. The vapor pressure of water at this temperature is 28 torr.

- A) 2.93
- B) 0.960
- C) 0.925
- D) 0.0388
- E) 925

Answer: C

Diff: 4

Page Ref: Sec. 10.6

61) SO₂ (5.00 g) and CO₂ (5.00 g) were placed in a 750.0 mL container at 50.0 °C. The total pressure in the container was _____ atm.

- A) 0.192
- B) 4.02
- C) 2.76
- D) 6.78
- E) 1.60

Answer: D

Diff: 3

Page Ref: Sec. 10.6

62) SO_2 (5.00 g) and CO_2 (5.00 g) are placed in a 750.0 mL container at 50.0 °C. The partial pressure of SO_2 in the container was _____ atm.

- A) 2.76
- B) 4.02
- C) 6.78
- D) 0.192
- E) 1.60

Answer: A

Diff: 3

Page Ref: Sec. 10.6

63) SO_2 (5.00 g) and CO_2 (5.00 g) were placed in a 750.0 mL container at 50.0 °C. The partial pressure of CO_2 in the container was _____ atm.

- A) 6.78
- B) 2.76
- C) 1.60
- D) 0.192
- E) 4.02

Answer: E

Diff: 3

Page Ref: Sec. 10.6

64) CO (5.00 g) and CO_2 (5.00 g) were placed in a 750.0 mL container at 50.0 °C. The total pressure in the container was _____ atm.

- A) 10.3
- B) 4.02
- C) 6.31
- D) 0.292
- E) 1.60

Answer: A

Diff: 3

Page Ref: Sec. 10.6

65) CO (5.00 g) and CO₂ (5.00 g) were placed in a 750.0 mL container at 50.0 °C. The partial pressure of CO in the container was _____ atm.

- A) 6.31
- B) 4.02
- C) 10.3
- D) 0.292
- E) 1.60

Answer: A

Diff: 3

Page Ref: Sec. 10.6

66) CO (5.00 g) and CO₂ (5.00 g) were placed in a 750.0 mL container at 50.0 °C. The partial pressure of CO₂ in the container was _____ atm.

- A) 4.02
- B) 10.3
- C) 1.60
- D) 0.292
- E) 6.31

Answer: A

Diff: 3

Page Ref: Sec. 10.6

67) The root-mean-square speed of CO at 113 °C is _____ m/s.

- A) 317
- B) 58.3
- C) 586
- D) 993
- E) 31.5

Answer: C

Diff: 3

Page Ref: Sec. 10.8

68) A sample of N_2 gas (2.0 mmol) effused through a pinhole in 5.5 s. It will take _____ s for the same amount of CH_4 to effuse under the same conditions.

- A) 7.3
- B) 5.5
- C) 3.1
- D) 4.2
- E) 9.6

Answer: D

Diff: 4

Page Ref: Sec. 10.8

69) A sample of O_2 gas (2.0 mmol) effused through a pinhole in 5.0 s. It will take _____ s for the same amount of CO_2 to effuse under the same conditions.

- A) 4.3
- B) 0.23
- C) 3.6
- D) 5.9
- E) 6.9

Answer: D

Diff: 4

Page Ref: Sec. 10.8

70) A sample of He gas (2.0 mmol) effused through a pinhole in 53 s. The same amount of an unknown gas, under the same conditions, effused through the pinhole in 248 s. The molecular mass of the unknown gas is _____ g/mol.

- A) 0.19
- B) 5.5
- C) 88
- D) 19
- E) 350

Answer: C

Diff: 4

Page Ref: Sec. 10.8

Chemistry, 11e (Brown/LeMay/Brusten/Murphy)
Chapter 10: Gases

71) Using the van der Waals equation, the pressure in a 22.4 L vessel containing 1.00 mol of neon gas at 100 °C is _____ atm. ($a = 0.211 \text{ L}^2 - \text{atm/mol}^2$, $b = 0.0171 \text{ L/mol}$)

- A) 0.730
- B) 1.00
- C) 1.21
- D) 1.37
- E) 0.367

Answer: D

Diff: 5

Page Ref: Sec. 10.9

72) Using the van der Waals equation, the pressure in a 22.4 L vessel containing 1.50 mol of chlorine gas at 0.00 °C is _____ atm.
($a = 6.49 \text{ L}^2 - \text{atm/mol}^2$, $b = 0.0562 \text{ L/mol}$)

- A) 0.993
- B) 1.50
- C) 0.676
- D) 1.91
- E) 1.48

Answer: E

Diff: 5

Page Ref: Sec. 10.9

10.2 Multiple Choice Questions

1) Which of the following statements about gases is false?

- A) Gases are highly compressible.
- B) Distances between molecules of gas are very large compared to bond distances within molecules.
- C) Non-reacting gas mixtures are homogeneous.
- D) Gases expand spontaneously to fill the container they are placed in.
- E) All gases are colorless and odorless at room temperature.

Answer: E

Diff: 1

Page Ref: Sec. 10.1

2) Of the following, _____ has a slight odor of bitter almonds and is toxic.

- A) NH_3
- B) N_2O
- C) CO
- D) CH_4
- E) HCN

Answer: E

Diff: 2

Page Ref: Sec. 10.1

3) Of the following, _____ has the odor of rotting eggs.

- A) NH_3
- B) H_2S
- C) CO
- D) NO_2
- E) HCN

Answer: B

Diff: 2

Page Ref: Sec. 10.1

4) One significant difference between gases and liquids is that _____.

- A) a gas is made up of molecules
- B) a gas assumes the volume of its container
- C) a gas may consist of both elements and compounds
- D) gases are always mixtures
- E) All of the above answers are correct.

Answer: B

Diff: 1

Page Ref: Sec. 10.1

5) Molecular compounds of low molecular weight tend to be gases at room temperature. Which of the following is most likely not a gas at room temperature?

- A) Cl_2
- B) HCl
- C) LiCl
- D) H_2
- E) CH_4

Answer: C

Diff: 1

Page Ref: Sec. 10.1

6) Gaseous mixtures _____.

- A) can only contain molecules
- B) are all heterogeneous
- C) can only contain isolated atoms
- D) are all homogeneous
- E) must contain both isolated atoms and molecules

Answer: D

Diff: 1

Page Ref: Sec. 10.1

7 Which of the following equations shows an incorrect relationship between pressures given in terms of different units?

- A) $1.20 \text{ atm} = 122 \text{ kPa}$
- B) $152 \text{ mm Hg} = 2.03 \times 10^4 \text{ Pa}$
- C) $0.760 \text{ atm} = 578 \text{ mm Hg}$
- D) $1.0 \text{ torr} = 2.00 \text{ mm Hg}$
- E) $1.00 \text{ atm} = 760 \text{ torr}$

Answer: D

Diff: 2

Page Ref: Sec. 10.2

8) The pressure exerted by a column of liquid is equal to the product of the height of the column times the gravitational constant times the density of the liquid, $P = gh\delta$. How high a column of water ($\delta = 1.0 \text{ g/mL}$) would be supported by a pressure that supports a 713 mm column of mercury ($\delta = 13.6 \text{ g/mL}$)?

- A) 14 mm
- B) 52 mm
- C) 713 mm
- D) $1.2 \times 10^4 \text{ mm}$
- E) $9.7 \times 10^3 \text{ mm}$

Answer: E

Diff: 3

Page Ref: Sec. 10.2

9) The pressure exerted by a column of liquid is equal to the product of the height of the column times the gravitational constant times the density of the liquid, $P = gh\rho$. How high a column of methanol ($d = 0.79 \text{ g/mL}$) would be supported by a pressure that supports a 713 mm column of mercury ($d = 13.6 \text{ g/mL}$)?

- A) 713 mm
- B) 41 mm
- C) 1.2×10^4 mm
- D) 9.7×10^3 mm
- E) 17 mm

Answer: C

Diff: 3

Page Ref: Sec. 10.2

10) If one was told that their blood pressure was 130/80, their systolic pressure was _____.

- A) 130 Pa
- B) 130 mm Hg
- C) 80 Pa
- D) 80 mm Hg
- E) 80 psi

Answer: B

Diff: 1

Page Ref: Sec. 10.2

11) Which statement about atmospheric pressure is false?

- A) As air becomes thinner, its density decreases.
- B) Air actually has weight.
- C) With an increase in altitude, atmospheric pressure increases as well.
- D) The warmer the air, the lower the atmospheric pressure.
- E) Atmospheric pressure prevents water in lakes, rivers, and oceans from boiling away.

Answer: C

Diff: 1

Page Ref: Sec. 10.2, 10.3

Chemistry, 11e (Brown/LeMay/Brusten/Murphy)

Chapter 10: Gases

12) In ideal gas equation calculations, expressing pressure in Pascals (Pa), necessitates the use of the gas constant, R, equal to _____.

A) 0.08206 atm L mol⁻¹K⁻¹

B) 8.314 J mol⁻¹K⁻¹

C) 62.36 L torr mol⁻¹K⁻¹

D) 1.987 cal mol⁻¹K⁻¹

E) none of the above

Answer: B

Diff: 2

Page Ref: Sec. 10.2, 10.3

13) The first person to investigate the relationship between the pressure of a gas and its volume was _____.

A) Amadeo Avogadro

B) Lord Kelvin

C) Jacques Charles

D) Robert Boyle

E) Joseph Louis Gay-Lussac

Answer: D

Diff: 1

Page Ref: Sec. 10.3

14) Of the following, _____ is a correct statement of Boyle's law.

A) $PV = \text{constant}$

B) $\frac{P}{V} = \text{constant}$

C) $\frac{V}{P} = \text{constant}$

D) $\frac{V}{T} = \text{constant}$

E) $\frac{n}{P} = \text{constant}$

Answer: A

Diff: 2

Page Ref: Sec. 10.3

15) "Isothermal" means _____.

A) at constant pressure

B) at constant temperature

C) at variable temperature and pressure conditions

D) at ideal temperature and pressure conditions

E) that $\Delta H_{\text{rxn}} = 0$

Answer: B

Diff: 1

Page Ref: Sec. 10.3

16) Of the following, _____ is a valid statement of Charles' law.

A) $\frac{P}{T} = \text{constant}$

B) $\frac{V}{T} = \text{constant}$

C) $PV = \text{constant}$

D) $V = \text{constant} \times n$

E) $V = \text{constant} \times P$

Answer: B

Diff: 2

Page Ref: Sec. 10.3

17) Which one of the following is a valid statement of Avogadro's law?

A) $\frac{P}{T} = \text{constant}$

B) $\frac{V}{T} = \text{constant}$

C) $PV = \text{constant}$

D) $V = \text{constant} \times n$

E) $V = \text{constant} \times P$

Answer: D

Diff: 2

Page Ref: Sec. 10.3

18) The volume of an ideal gas is zero at _____.

A) $0\text{ }^{\circ}\text{C}$

B) $-45\text{ }^{\circ}\text{F}$

C) -273 K

D) -363 K

E) $-273\text{ }^{\circ}\text{C}$

Answer: E

Diff: 1

Page Ref: Sec. 10.3

19) Of the following, only _____ is impossible for an ideal gas.

A) $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

B) $V_1 T_1 = V_2 T_2$

C) $\frac{V_1}{V_2} = \frac{T_1}{T_2}$

D) $V_2 = \frac{T_2}{T_1} V_1$

E) $\frac{V_1}{V_2} = \frac{T_1}{T_2} = 0$

Answer: B

Diff: 2

Page Ref: Sec. 10.3

20) The molar volume of a gas at STP is _____ L.

A) 0.08206

B) 62.36

C) 1.00

D) 22.4

E) 14.7

Answer: D

Diff: 1

Page Ref: Sec. 10.4

21) How many moles of gas are there in a 45.0 L container at 25.0 °C and 500.0 mm Hg?

A) 0.630

B) 6.11

C) 18.4

D) 1.21

E) 207

Answer: D

Diff: 3

Page Ref: Sec. 10.4

22) Standard temperature and pressure (STP), in the context of gases, refers to _____.

- A) 298.15 K and 1 atm
- B) 273.15 K and 1 atm
- C) 298.15 K and 1 torr
- D) 273.15 K and 1 pascal
- E) 273.15 K and 1 torr

Answer: B

Diff: 1

Page Ref: Sec. 10.4

23) The volume of 1.20 mol of gas at 61.3 kPa and 25.0 °C is _____ L.

- A) 135
- B) 48.5
- C) 52.4
- D) 108
- E) 55.7

Answer: B

Diff: 2

Page Ref: Sec. 10.4

24) Sodium bicarbonate is reacted with concentrated hydrochloric acid at 37.0 °C and 1.00 atm. The reaction of 6.00 kg of bicarbonate with excess hydrochloric acid under these conditions will produce _____ L of CO₂

- A) 1.09×10^2
- B) 2.85×10^4
- C) 1.82×10^4
- D) 8.70×10^2
- E) 1.82×10^3

Answer: E

Diff: 5

Page Ref: Sec. 10.4

Chemistry, 11e (Brown/LeMay/Brusten/Murphy)
Chapter 10: Gases

25) The volume of a sample of gas (2.49 g) was 752 mL at 1.98 atm and 62 °C. The gas is _____.

- A) SO₂
- B) SO₃
- C) NH₃
- D) NO₂
- E) Ne

Answer: D

Diff: 4

Page Ref: Sec. 10.5

26) The density of _____ is 0.900 g/L at STP.

- A) CH₄
- B) Ne
- C) CO
- D) N₂
- E) NO

Answer: B

Diff: 4

Page Ref: Sec. 10.5

27) The density of NO₂ in a 3.50 L tank at 780.0 torr and 37.0 °C is _____ g/L.

- A) 1.64
- B) 9.30
- C) 1.86
- D) 2.92
- E) 3.27

Answer: C

Diff: 4

Page Ref: Sec. 10.5

Chemistry, 11e (Brown/LeMay/Brusten/Murphy)
Chapter 10: Gases

28) The density (in g/L) of CO_2 at 1140 torr and $60.0\text{ }^\circ\text{C}$ is _____.

- A) 2.42
- B) 16.2
- C) 5.70
- D) 44.0
- E) 10.9

Answer: A

Diff: 4

Page Ref: Sec. 10.5

29) Of the following gases, _____ has density of 2.104 g/L at 303 K and 1.31 atm.

- A) He
- B) Ne
- C) Ar
- D) Kr
- E) Xe

Answer: C

Diff: 4

Page Ref: Sec. 10.5

30) A 255 mL round-bottom flask is weighed and found to have a mass of 114.85 g. A few milliliters of an easily vaporized liquid are added to the flask and the flask is immersed in a boiling water bath. All of the liquid vaporizes at the boiling temperature of water, filling the flask with vapor. When all of the liquid has vaporized, the flask is removed from the bath, cooled, dried, and reweighed. The new mass of the flask and the condensed vapor is 115.23 g. Which of the following compounds could the liquid be? (Assume the ambient pressure is 1 atm.)

- A) C_4H_{10}
- B) C_3H_7OH
- C) C_2H_6
- D) C_2H_5OH
- E) C_4H_9OH

Answer: D

Diff: 5

Page Ref: Sec. 10.5

31) A sample of an unknown volatile liquid was injected into a Dumas flask ($m_{\text{flask}} = 27.0928$ g, $V_{\text{flask}} = 0.1040$ L) and heated until no visible traces of the liquid could be found. The flask and its contents were then rapidly cooled and reweighed ($m_{\text{flask} + \text{vapor}} = 27.4593$ g) The atmospheric pressure and temperature during the experiment were 0.976 atm and 18.0 °C, respectively. The unknown volatile liquid was _____.

- A) C_6H_{12}
- B) C_6H_{14}
- C) C_7H_{14}
- D) C_7H_{16}
- E) C_6H_6

Answer: B

Diff: 5

Page Ref: Sec. 10.5

32) The density of air at STP is 1.285 g/L. Which of the following cannot be used to fill a balloon that will float in air at STP?

- A) CH₄
- B) NO
- C) Ne
- D) NH₃
- E) HF

Answer: B

Diff: 4

Page Ref: Sec. 10.5

33) Removal of _____ from the natural gas both purifies the natural gas and serves as an alternative method of production of an industrially important chemical element.

- A) CO₂
- B) H₂S
- C) NH₃
- D) As₂O₃
- E) He

Answer: B

Diff: 2

Page Ref: Sec. 10.6

34) 10.0 grams of argon and 20.0 grams of neon are placed in a 1200.0 ml container at 25.0 °C. The partial pressure of neon is _____ atm.

- A) 20.2
- B) 8.70
- C) 0.700
- D) 3.40
- E) 5.60

Answer: A

Diff: 5

Page Ref: Sec. 10.6

35) A mixture of Xe, Kr, and Ar has a total pressure of 6.70 atm. What is the mole fraction of Kr if the partial pressures of Xe and Ar are 1.60 atm and 2.80 atm, respectively.

- A) 0.174
- B) 0.256
- C) 0.343
- D) 0.481
- E) 0.570

Answer: C

Diff: 2

Page Ref: Sec. 10.6

36) The average kinetic energy of the particles of a gas is directly proportional to _____.

- A) the rms speed
- B) the square of the rms speed
- C) the square root of the rms speed
- D) the square of the particle mass
- E) the particle mass

Answer: B

Diff: 2

Page Ref: Sec. 10.7

37) The kinetic-molecular theory predicts that pressure rises as the temperature of a gas increases because _____.

- A) the average kinetic energy of the gas molecules decreases
- B) the gas molecules collide more frequently with the wall
- C) the gas molecules collide less frequently with the wall
- D) the gas molecules collide more energetically with the wall
- E) both the gas molecules collide more frequently with the wall and the gas molecules collide more energetically with the wall

Answer: E

Diff: 2

Page Ref: Sec. 10.7

38) According to kinetic-molecular theory, in which of the following gases will the root-mean-square speed of the molecules be the highest at 200 °C?

- A) HCl
- B) Cl₂
- C) H₂O
- D) SF₆
- E) None. The molecules of all gases have the same root-mean-square speed at any given temperature.

Answer: C

Diff: 3

Page Ref: Sec. 10.7

39) According to kinetic-molecular theory, if the temperature of a gas is raised from 100 °C to 200 °C, the average kinetic energy of the gas will _____.

- A) double
- B) increase by a factor of 1.27
- C) increase by a factor of 100
- D) decrease by half
- E) decrease by a factor of 100

Answer: B

Diff: 3

Page Ref: Sec. 10.7

40) Which of the following is not part of the kinetic-molecular theory?

- A) Atoms are neither created nor destroyed by ordinary chemical reactions.
- B) Attractive and repulsive forces between gas molecules are negligible.
- C) Gases consist of molecules in continuous, random motion.
- D) Collisions between gas molecules do not result in the loss of energy.
- E) The volume occupied by all of the gas molecules in a container is negligible compared to the volume of the container.

Answer: A

Diff: 2

Page Ref: Sec. 10.7

41) Of the following gases, _____ will have the greatest rate of effusion at a given temperature.

- A) NH_3
- B) CH_4
- C) Ar
- D) HBr
- E) HCl

Answer: B

Diff: 2

Page Ref: Sec. 10.8

42) The root-mean-square speed of H_2S at 26.0°C is _____ m/sec.

- A) 334
- B) 62.4
- C) 468
- D) 751
- E) 214

Answer: C

Diff: 5

Page Ref: Sec. 10.8

43) A tank containing both HF and HBr gases developed a leak. The ratio of the rate of effusion of HF to the rate of effusion of HBr is _____.

- A) 4.04
- B) 0.247
- C) 2.01
- D) 0.497
- E) 16.3

Answer: C

Diff: 3

Page Ref: Sec. 10.8

44) At 333 K, which of the pairs of gases below would have the most nearly identical rates of effusion?

A) N_2O and NO_2

B) CO and N_2

C) N_2 and O_2

D) CO and CO_2

E) NO_2 and N_2O_4

Answer: B

Diff: 3

Page Ref: Sec. 10.8

45) At STP, the ratio of the root-mean-square speed of CO_2 to that of SO_2 is

_____.

A) 2.001

B) 2.119

C) 1.000

D) 1.207

E) 1.456

Answer: D

Diff: 3

Page Ref: Sec. 10.8

46) Arrange the following gases in order of increasing average molecular speed at 25 °C.

He, O₂, CO₂, N₂

- A) He < N₂ < O₂ < CO₂
- B) He < O₂ < N₂ < CO₂
- C) CO₂ < O₂ < N₂ < He
- D) CO₂ < N₂ < O₂ < He
- E) CO₂ < He < N₂ < O₂

Answer: C

Diff: 3

Page Ref: Sec. 10.8

47) Arrange the following gases in order of increasing average molecular speed at 25 °C.

Cl₂, O₂, F₂, N₂

- A) Cl₂ < F₂ < O₂ < N₂
- B) Cl₂ < O₂ < F₂ < N₂
- C) N₂ < F₂ < Cl₂ < O₂
- D) Cl₂ < F₂ < N₂ < O₂
- E) F₂ < O₂ < N₂ < Cl₂

Answer: A

Diff: 3

Page Ref: Sec. 10.8

48) Which one of the following gases would have the highest average molecular speed at 25 °C?

- A) O₂
- B) N₂
- C) CO₂
- D) CH₄
- E) SF₆

Answer: D

Diff: 2

Page Ref: Sec. 10.8

49) A sample of oxygen gas (O₂) was found to effuse at a rate equal to three times that of an unknown gas. The molecular weight of the unknown gas is _____ g/mol.

- A) 288
- B) 96
- C) 55
- D) 4
- E) 10.7

Answer: A

Diff: 3

Page Ref: Sec. 10.8

50) A sample of oxygen gas was found to effuse at a rate equal to two times that of an unknown gas. The molecular weight of the unknown gas is _____ g/mol.

- A) 64
- B) 128
- C) 8
- D) 16
- E) 8.0

Answer: B

Diff: 3

Page Ref: Sec. 10.8

51) A mixture of two gases was allowed to effuse from a container. One of the gases escaped from the container 1.43 times as fast as the other one. The two gases could have been _____.

- A) CO and SF₆
- B) O₂ and Cl₂
- C) CO and CO₂
- D) Cl₂ and SF₆
- E) O₂ and SF₆

Answer: D

Diff: 3

Page Ref: Sec. 10.8

52) A mixture of carbon dioxide and an unknown gas was allowed to effuse from a container. The carbon dioxide took 1.25 times as long to escape as the unknown gas. Which one could be the unknown gas?

- A) Cl₂
- B) CO
- C) HCl
- D) H₂
- E) SO₂

Answer: B

Diff: 3

Page Ref: Sec. 10.8

53) How much faster does $^{235}\text{UF}_6$ effuse than $^{238}\text{UF}_6$?

- A) 1.013 times as fast
- B) 1.009 times as fast
- C) 1.004 times as fast
- D) 1.006 times as fast
- E) 1.018 times as fast

Answer: C

Diff: 4

Page Ref: Sec. 10.8

54) An ideal gas differs from a real gas in that the molecules of an ideal gas _____.

- A) have no attraction for one another
- B) have appreciable molecular volumes
- C) have a molecular weight of zero
- D) have no kinetic energy
- E) have an average molecular mass

Answer: A

Diff: 2

Page Ref: Sec. 10.9

55) A real gas will behave most like an ideal gas under conditions of _____.

- A) high temperature and high pressure
- B) high temperature and low pressure
- C) low temperature and high pressure
- D) low temperature and low pressure
- E) STP

Answer: B

Diff: 2

Page Ref: Sec. 10.9

56) Which one of the following gases would deviate the least from ideal gas behavior?

- A) Ne
- B) CH₃Cl
- C) Kr
- D) CO₂
- E) F₂

Answer: A

Diff: 2

Page Ref: Sec. 10.9

57) Which noble gas is expected to show the largest deviations from the ideal gas behavior?

- A) helium
- B) neon
- C) argon
- D) krypton
- E) xenon

Answer: E

Diff: 2

Page Ref: Sec. 10.9

58) The van der Waals equation for real gases recognizes that _____.

- A) gas particles have non-zero volumes and interact with each other
- B) molar volumes of gases of different types are different
- C) the non-zero volumes of gas particles effectively decrease the amount of "empty space" between them
- D) the molecular attractions between particles of gas decreases the pressure exerted by the gas
- E) all of the above statements are true

Answer: E

Diff: 3

Page Ref: Sec. 10.9

59) When gases are treated as real, via use of the van der Waals equation, the actual volume occupied by gas molecules _____ the pressure exerted and the attractive forces between gas molecules _____ the pressure exerted, as compared to an ideal gas.

- A) decreases, increases
- B) increases, increases
- C) increases, decreases
- D) does not affect, decreases
- E) does not affect, increases

Answer: C

Diff: 3

Page Ref: Sec. 10.9

10.3 Short Answer Questions

1) Abnormally high blood pressure is called _____.

Answer: hypertension

Diff: 1

Page Ref: Sec. 10.2

2) The temperature and pressure specified by STP are _____ °C and _____ atm.

Answer: 0, 1

Diff: 1

Page Ref: Sec. 10.4

3) How many molecules are there in 4.00 L of oxygen gas at 500 °C and 50.0 torr?

Answer: 2.50×10^{21}

Diff: 3

Page Ref: Sec. 10.4

4) The volume of HCl gas required to react with excess Ca to produce 11.4 L of hydrogen gas at 1.62 atm and 62.0 °C is _____ L.

Answer: 22.8

Diff: 4

Page Ref: Sec. 10.4

5) What is the density (in g/L) of oxygen gas at 77.0 °C and 700.0 torr?

Answer: 1.03

Diff: 4

Page Ref: Sec. 10.5

6) What is the partial pressure (in mm Hg) of neon in a 4.00 L vessel that contains 0.838 mol of methane, 0.184 mol of ethane, and 0.755 mol of neon at a total pressure of 928 mm Hg?

Answer: 394

Diff: 4

Page Ref: Sec. 10.6

7) The rms speed of methane molecules at 45.0 °C is _____ m/sec.

Answer: 703.3

Diff: 4

Page Ref: Sec. 10.8

8) The deviation from ideal behavior of a gas is most evident at _____ and/or low temperature.

Answer: high pressure

Diff: 3

Page Ref: Sec. 10.9

9) The van der Waals equation corrects the ideal gas law for the finite volume and _____ of gas molecules.

Answer: attractive forces

Diff: 4

Page Ref: Sec. 10.9

10.4 True/False Questions

1) The main component of air is oxygen.

Answer: False

Diff: 1

Page Ref: Sec. 10.1

2) If the temperature is lowered from 60 °C to 30 °C, the volume of a fixed amount of gas will be one half the original volume.

Answer: False

Diff: 2

Page Ref: Sec. 10.3

3) A gas is considered "ideal" if one mole of it in a one-liter container exerts a pressure of exactly 1 atm at room temperature.

Answer: False

Diff: 2

Page Ref: Sec. 10.4

4) Kinetic-molecular theory assumes that attractive and repulsive forces between gas particles are stronger than those between gas particles and container walls.

Answer: False

Diff: 2

Page Ref: Sec. 10.7

5) According to the kinetic-molecular theory, molecules of different gases at the same temperature always have the same average kinetic energy.

Answer: True

Diff: 2

Page Ref: Sec. 10.7

6) The effusion rate of a gas is proportional to the square root of its molar mass.

Answer: False

Diff: 3

Page Ref: Sec. 10.8

7) Two deviations of real gases from ideal gases which are treated in the van der Waals equation are finite molecular volume and non-zero molecular attractions.

Answer: True

Diff: 2

Page Ref: Sec. 10.9

10.5 Algorithmic Questions

1) A fixed amount of gas at 25.0 °C occupies a volume of 10.0 L when the pressure is 667 torr. Use Boyle's law to calculate the pressure (torr) when the volume is reduced to 7.88 L at a constant temperature of 25.0 °C.

A) 846

B) 0.118

C) 5.26×10^4

D) 526

E) 1.11

Answer: A

Diff: 2

Page Ref: Sec. 10.3

2) A fixed amount of gas at 25.0 °C occupies a volume of 10.0 L when the pressure is 629 torr. Use Charles's law to calculate the volume (L) the gas will occupy when the temperature is increased to 121°C while maintaining the pressure at 629 torr.

- A) 10.9
- B) 13.2
- C) 2.07
- D) 7.56
- E) 48.4

Answer: B

Diff: 2

Page Ref: Sec. 10.3

3) The density of nitric oxide (NO) gas at 1.21 atm and 54.1 °C is _____ g/L.

- A) 0.0451
- B) 0.740
- C) 1.35
- D) 0.273
- E) 8.2

Answer: C

Diff: 3

Page Ref: Sec. 10.5

4) The density of krypton gas at 1.21 atm and 50.0 °C is _____ g/L.

- A) 0.0456
- B) 0.262
- C) 0.295
- D) 3.82
- E) 7.65

Answer: D

Diff: 3

Page Ref: Sec. 10.5

5) The density of chlorine gas at 1.21 atm and 34.9 °C is _____ g/L.

- A) 0.0479
- B) 0.295
- C) 0.423
- D) 1.70
- E) 3.39

Answer: E

Diff: 3

Page Ref: Sec. 10.5

6) A 1.44-g sample of an unknown pure gas occupies a volume of 0.335 L at a pressure of 1.00 atm and a temperature of 100.0 °C. The unknown gas is _____.

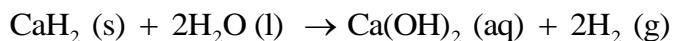
- A) argon
- B) helium
- C) krypton
- D) neon
- E) xenon

Answer: E

Diff: 4

Page Ref: Sec. 10.5

7) Calcium hydride (CaH₂) reacts with water to form hydrogen gas:



How many grams of CaH₂ are needed to generate 48.0 L of H₂ gas at a pressure of 0.888 atm and a temperature of 32 °C?

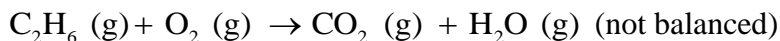
- A) 50.7
- B) 0.851
- C) 143
- D) 35.8
- E) 71.7

Answer: D

Diff: 4

Page Ref: Sec. 10.5

8) Given the equation



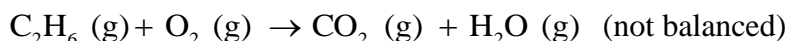
Determine the number of liters of CO_2 formed at STP. when 240.0 grams of C_2H_6 is burned in excess oxygen gas.

Answer: 358

Diff: 4

Page Ref: Sec. 10.5

9) Given the equation



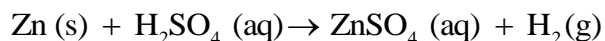
Determine the number of liters of O_2 consumed at STP when 270.0 grams of C_2H_6 is burned.

Answer: 706

Diff: 4

Page Ref: Sec. 10.5

10) Zinc reacts with aqueous sulfuric acid to form hydrogen gas:



In an experiment, 225 mL of wet H_2 is collected over water at 27 °C and a barometric pressure of 748 torr . How many grams of Zn have been consumed? The vapor pressure of water at 27 °C is 26.74 torr

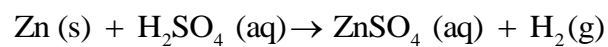
- A) 4.79×10^6
- B) 0.567
- C) 567
- D) 431
- E) 4.31×10^5

Answer: B

Diff: 4

Page Ref: Sec. 10.6

11) Zinc reacts with aqueous sulfuric acid to form hydrogen gas:



In an experiment, 201 mL of wet H_2 is collected over water at 27°C and a barometric pressure of 733 torr. The vapor pressure of water at 27°C is 26.74 torr. The partial pressure of hydrogen in this experiment is _____ atm.

- A) 0.929
- B) 706
- C) 0.964
- D) 760
- E) 1.00

Answer: A

Diff: 2

Page Ref: Sec. 10.6