Appendix A

Answers to Numerical Chapter and Unit Review Questions

Chapter 1

5. (a) ; 10.0 mL;
(b)

6. (a) **(b)**
(c) **(d)**

7. (a) 1 **(b)** 4 **(c)** 1 **(d)** 2
(e) 5 **(f)** 4 **(g)** 5

8. (b) **(c)**

9. (a) 8.73 mL **(b)**
(c) **(d)** 0.7
(e) **(f)**

10. (a) **(b)**
(c) **(d)**

11.

12. (a)
(b) the tenths digit, to the right of the decimal

Chapter 2

6. (a) 7 **(b)** 7 **(c)** 10 **(d)**
(e) **(f)** **(g)** Cr **(h)** 24
(i) 28 **(j)** 21 **(k)** **(l)** 19
(m) 9 **(n)** 9 **(o)** 9 **(p)** 0

7. 32 neutrons; 27 electrons

8. (a) **(b)**

Chapter 3

2. (a) 1.79 **(b)** 1.35 **(c)** 1.28 **(d)** 0.40

14. (a) 1.55; 1.49; 2.43
(b) 2.41; 1.59; 1.39
(c) 1.62; 1.33; 1.26; 1.23; 1.30

16. (a) Ag, 1; Cl, 1 **(b)** Mn, 2; P, 3
(c) P, 5; Cl, 1 **(d)** C, 4; H, 1
(e) Ti, 4; O, 2 **(f)** Hg, 2; F, 1
(g) Ca, 2; O, 2 **(h)** Fe, 2; S, 2

Unit 1

42. (a) 21.5 **(b)**
(c) **(d)** 17.5 g
(e)

44. 7, 7, 10, , 16, , 2, 4, 2, , 18

Chapter 5

9. 40

10. 69.8 u

11. 72.71 u

12. K-39, 95.0%; K-40, 5.0%

13. (a) **(b)**
(c) **(d)** 4.38 mol
(e) 0.126 mol

14. (a) **(b)** 1.23 mol
(c) **(d)**
(e) 2.69 mol **(f)**

15. : 17.0, , 1.46, 5.84; : 18.0, 1.58, , ; : 158, , , ; : 246, , , ; : 152, , , ; : 78.0, , ,

16. (a) 355 **(b)** 74.1
(c) 142 **(d)** 252
(e) 310 **(f)** 183

17. (a) **(b)**
(c) **(d)** 1.45
(e) **(f)**

18.

19.

20. (a) 131 **(b)** 131
(c) **(d)**
(e)

21.

22.

23.

24. 192 g

25. Br-79, 55.0%; Br-81, 45.0%

26. (a) 1.00 **(b)** 84.9

27. (a) 14 **(b)** 16
(c)

32. (a) **(b)**

33. 101 mg

Chapter 6

5. 2.64 g

6. (a) 9.9% C; 58.6% Cl; 31.4% F
(b) 80.1% Pb; 16.5% O; 0.3% H; 3.1% C

7. (a) 6.86 g **(b)** 1.74 g

8. (a) 63.5% **(b)** 127 kg

9. 26.9 g

10. 168 g

11.

12.

13. (b)

14.

15.

16.

17. (a) **(b)**

18. (a) **(b)**

19. V

20.

21. 7

22. (a) 37.5% C; 4.2% H; 58.3% O
(b) **(c)**

23. , 1.37 g; , 1.13 g

28. (a) 0.87 g **(b)** 0.56 g

29. (b) 60.3% **(c)**

30. (b)

Chapter 7

6. 9.60 g

7.

8. 292 g

9. (b) 8.94 g **(c)** 0.407 g S

10. 36.1 g

11. 2.04 g

12. 22.6 g

13. 1.65 g

14. 2.58 g

15. (a) 7.32 g **(b)** 34.2%
(c) 7.23 g

16. 53.7%

17. (a) 15.1 g **(b)** 0.414 g
(c) 14.2 g **(d)** 94.3%

19. (a) 3.24 g **(b)** 270 g

23.

24. (d)

Unit 2

29. (a) molecules; atoms
(b) ions **(c)** atoms

33. (a) 0.167 mol **(b)** mol
(c) atoms

34.

35.

37. 68.1% C; 13.7% H; 18.1% O

38. 2.84 g

42. (a) 0.015 mm **(b)** 2.7 nm

Chapter 8

11. 6.25 g

12. (a) 25 g **(b)** 225 g
(c) 2.50 mol/L

13. 96 mL

14. 1.2 ppm

15. 5.67 mol/L

16. 0.427 mol/L

17. (a) 9.89 g **(b)** 83 g

18. (a) 1.7 mol/L **(b)** 1.44 mol/L

19. (a) 0.381 mol/L **(b)** 0.25 mol/L

20. 10.0 g

23. (b) approximately 90 g **(c)** approximately 145 g
(d) approximately

24. approximately 380 g

25.

29. 0.25 ppm; 250 ppb

Chapter 9

13.

14. (a) **(b)**
(c) 0.999 mol/L

15. 0.104 mol/L

16. mol/L; mol/L;

17. iron(III) chloride

18. (a) ;
(b) ;

19.

20. 12.2 g

22. (b) 0.01057 mol **(c)** 120.4 g/mol

24. (b) 0.09600%

Chapter 10

10. (b) half

13. (a) **(b)** 55 mol

14. 0.800 mol/L

15. 0.020 mol/L

16.

18. (a) 2.399 mol/L **(b)** no (because 9.317%)

Unit 3

22.

23.

Chapter 11

16. 752 mm

17. (a) **(b)**
(c) 750

18. ,

19. (a) 87.5 **(b)** −148

24. 0.50 L

25. 37.5 atm

26.

27. 21 L

28. 2.8 L

29. −233

30. (a) 16.2 L **(b)**
(c) 109 mL

31. 2.2 L

32. 50.2 kPa

33.

34. 62.5 kPa

35.

36. 262 kPa

37. 68 days

38.

39. 24 atm

40.

41. 21 mL

Chapter 12

12. (a) 22.4 L **(b)**
(c)

13.

14. 50.4 L

15.

16.

17.

18. (a) 1.69 g/L **(b)** 1.66 g/L

19. (a) 2.40 g **(b)** 1.75 g

20. (a) 20 g/mol

21. (a) 7.46 mol **(b)** 628 kPa
(c) 210 kPa

22.

23. ;

24.

25.

26. (b) 10 L **(c)** 14.3 g

27. 4.35 g

28. 3.00 L

29. 7.33 L

30.

31. 1.70 L

32. (b) 0.0514 g **(c)** 0.735 g

35. (a) 8.314 kPa•L/mol•K
(b) 0.08206 atm•L/mol•K
(c) 62.36 torr•L/mol•K

36. (a) 68 L **(b)** 3.4 L; 3.4 L
(c) 2.5 mL

Unit 4

16.

17. 0.0005 mol

18. 2.0 L

19. 202.6 mL

20. 56.8 atm

21. 368 kPa

22.

23.

24. 1.5

25. 4.6; ; ; −15.8; 15.1; 88

26. 54.7 mL

27. , , ,

28.

29. 78 kPa

30.

31. 16 kg

32. 7.5 L, 5.0 L

33. 0.34 L

34. 29.5 g

35. 0.69 L

36.

37.

38. (a)
(b)
(c)
(d)

39.

Chapter 14

8. (b) 121 kJ

13. 322 kJ

14. Sample 2

15. 4.93 Cal/g

16. 158 kJ

17. 188 kJ

18. (a) 5.0 kJ/g, 1.2 Cal/g **(b)** 3.6 Cal/g

20. 2.51 kJ

21.

22.

24.

25. (a) 56.2 mL **(b)** 34.9 L

Unit 5

15. (c) , 0.42 kJ/g

28. (a) 26 min **(b)** 2.6 km

29. (a) **(b)**