

**Test Bank for Chemistry in Focus A Molecular View of Our World 6th Edition by Nivaldo J Tro ISBN 1305084470 9781305084476**

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Solution Manual

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**Chapter 02 - The Chemist's Toolbox**

1. When adding and subtracting, the number of significant figures in the answer is determined by\_\_\_\_\_.
- the most precise number
  - the least precise number
  - the number with the most significant figures in the calculation
  - the number with the fewest significant figures in the calculation

*ANSWER:* b

*POINTS:* 1

2. When multiplying and dividing, the number of significant figures in the answer is determined by\_\_\_\_\_.
- the most precise number
  - the least precise number
  - the number with the most significant figures in the calculation
  - the number with the fewest significant figures in the calculation

*ANSWER:* d

*POINTS:* 1

3. How many significant figures are there in the number 10.00?
- 1
  - 2
  - 3
  - 4

*ANSWER:* d

*POINTS:* 1

4. How many significant figures are there in the number 10,100?
- 1
  - 3
  - 4
  - 5

*ANSWER:* b

*POINTS:* 1

5. Calculate the density with the correct number of significant figures of a 50.0 g sample of mercury with a volume of 3.66 mL.
- 13.66 g/mL
  - 13.7 mL

c. 183 g/mL

d. 0.0732 g/mL

e. 0.073 g/mL

ANSWER: b

POINTS: 1

6. Calculate the density to the correct number of significant figures of a 100.0 g sample of mercury which occupies a volume of 7.36 cm<sup>3</sup>.

a. 13.58 g/cm<sup>3</sup>

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- b.  $13.66 \text{ g/cm}^3$
- c.  $183 \text{ g/cm}^3$
- d.  $0.0732 \text{ g/cm}^3$
- e.  $0.073 \text{ g/cm}^3$

ANSWER: a

POINTS: 1

7. Determine the mass in grams of a gold sample which occupies a volume of 16.39 mL? Gold has a density of 19.3 g/mL.

- a. 0.118 g
- b. 0.316 g
- c. 0.849 g
- d. 1.18 g
- e. 316 g

ANSWER: e

POINTS: 1

8. Determine the volume occupied by 1.5 g of ethyl alcohol. The density of ethyl alcohol is 0.789 g/mL.

- a. 1.9 mL
- b. 1.3 mL
- c. 0.53 mL
- d. 0.526 mL
- e. 1.331 mL

ANSWER: a

POINTS: 1

9. Chloroform is a commonly used anesthetic with a density of 1.483 g/mL. Determine the volume of chloroform needed to deliver a 9.37 g sample of the anesthetic.

- a. 0.158 g
- b. 6.32 g
- c. 13.9 g
- d. 13.89 g
- e. 0.0632 g

ANSWER: b

POINTS: 1

10. If 15.0 mL of a metal has a mass of 103.0 g, what is the density of the metal?

- a. 6.87 g/mL
- b. 1550 g/mL
- c. 0.146 g/mL
- d. 1.46 g/mL
- e. None of these.

ANSWER: a

POINTS: 1

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11. The density of gold is 19.3 g/mL. If the current price of gold is \$56.75 per gram, what is the volume of a nugget of gold worth \$150.00?

- a. 1.15 mL
- b. 0.868 mL
- c. 1.72 mL
- d. 1.27 mL
- e. 0.137 mL

ANSWER: e

POINTS: 1

12. Which is the standard SI unit for mass?

- a. Gram
- b. Pound
- c. Ounce
- d. Kilogram
- e. Ton

ANSWER: d

POINTS: 1

13. Which is the standard SI unit for length?

- a. Meter
- b. Feet
- c. Mile
- d. Kilometer
- e. Centimeter

ANSWER: a

POINTS: 1

14. Which is the correct SI unit for time?

- a. Meter
- b. Hour
- c. Second
- d. Minute
- e. Gram

ANSWER: c

POINTS: 1

15. Which of these represents the SI prefix for micro ( $\mu$ )?

- a.  $10^{-6}$
- b.  $10^{-3}$
- c.  $10^{-9}$
- d.  $10^{-2}$
- e.  $10^6$

ANSWER: a

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POINTS: 1

16. Which of these represents the SI prefix for centi (c)?

- a.  $10^{-6}$
- b.  $10^{-3}$
- c.  $10^{-2}$
- d.  $10^{-1}$
- e.  $10^6$

ANSWER: d

POINTS: 1

17. Which of these represents the SI prefix for mega (M)?

- a.  $10^9$
- b.  $10^6$
- c.  $10^3$
- d.  $10^{-2}$
- e.  $10^{-6}$

ANSWER: b

POINTS: 1

18. The diameter of the nucleus of an atom is approximately  $1 \times 10^{-13}$  meters. If 1 nm is equal to 10 Angstroms, what is the diameter of the nucleus in Angstroms? (1 nm =  $1 \times 10^{-9}$  meter)

- a.  $1 \times 10^{-21}$  A
- b.  $1 \times 10^{-6}$  A
- c.  $1 \times 10^{-5}$  A
- d.  $1 \times 10^{-4}$  A
- e.  $1 \times 10^{-3}$  A

ANSWER: e

POINTS: 1

19. Convert 89.5 meters to millimeters.

- a.  $8.95 \times 10^4$  mm
- b.  $8.95 \times 10^{-4}$  mm
- c.  $8.95 \times 10^2$  mm
- d.  $8.95 \times 10^{-2}$  mm
- e. None of these.

ANSWER: a

POINTS: 1

20. Which of the following is not true?

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- a. 1 cm = .01 m
- b. 100 cm = 1 m
- c. 1 cm = 100m
- d. .01 cm = .0001m
- e. 10000 cm = 100 m

ANSWER: c

POINTS: 1

21. Given that 1 in = 2.54 cm, which of the following is true?

- a.  $1 \text{ in}^2 = 2.54 \text{ cm}^2$
- b.  $1 \text{ in}^2 = 5.08 \text{ cm}^2$
- c.  $1 \text{ in}^2 = 6.45 \text{ cm}^2$
- d.  $1 \text{ in}^2 = 1.27 \text{ cm}^2$
- e. None of these.

ANSWER: c

POINTS: 1

22. One  $\text{m}^3$  equals \_\_\_\_\_.

- a. 1000 mm
- b. 1,000,000  $\text{mm}^3$
- c. 1,000,000,000  $\text{mm}^3$
- d. 1,000,000,000,000  $\text{mm}^3$

ANSWER: c

POINTS: 1

23. One milliliter is equal to \_\_\_\_\_.

- a. 2.54 cubic inches
- b. 1000 liters
- c. 1 cubic centimeter
- d. 16.39 cubic inches

ANSWER: c

POINTS: 1

24.  $1.00 \text{ in}^3$  equals \_\_\_\_\_.

- a. 2.54 cm
- b.  $7.62 \text{ cm}^3$
- c.  $16.38 \text{ cm}^3$
- d.  $.394 \text{ cm}^3$

ANSWER: c

POINTS: 1

25. The long jump record is 8.90 m. What is the length in inches? (1 m = 39.37 inches)

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- a. 9.73 inches
- b. 293 inches
- c. 350 inches
- d. 4204 inches
- e. 5000 inches

ANSWER: c

POINTS: 1

26. The long jump record is 8.90 m. What is the length in yards? (1 yd = 0.9144 m)

- a. 9.73 yards
- b. 293 yards
- c. 350 yards
- d. 4204 yards
- e. 5000 yards

ANSWER: a

POINTS: 1

27. A football field is 100.0 yards long. What is its length in meters? (1 yd = 0.9144 m)

- a. 0.09144 m
- b. 91.44 m
- c. 274.32 m
- d. 334 m
- e. 0

$3$   
~~9144~~ × 100 m

ANSWER: b

POINTS: 1

28. A football field is 100 yards long. What is its length in centimeters? (1 yd = 0.9144 m)

- a. 0.09144 cm
- b. 91.44 cm
- c. 274.32 cm
- d. 334 cm
- e.  $0.9144 \times 10^3$  cm

ANSWER: e

POINTS: 1

29. How many kilograms of calcium are there in a 173 pounds of calcium? (1 pound = 454 grams)

- a. 1.1 kg
- b. 78.54 kg
- c.  $1.1 \times 10^2$  kg
- d.  $3.8 \times 10^4$  kg
- e.  $7.85 \times 10^4$  kg

ANSWER: b



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*POINTS:* 1

## Chapter 02 - The Chemist's Toolbox

30. Most races are now measured in kilometers. What is the distance in miles a runner must complete in a 10 kilometer run. (1 km = 0.62137 mile)

- a. 3.1 miles
- b. 6.2 miles
- c. 16.1 miles
- d. 32.2 miles
- e. 62.137

ANSWER: b

POINTS: 1

31. Convert  $2.50 \times 10^4$  meters to miles ( 1 mile = 5280 feet).

- a. 76.2 miles
- b. 6.35 miles
- c. 15.5 miles
- d. 155 miles
- e. 186 miles

ANSWER: c

POINTS: 1

32. Convert 10.5 mm/s to ft/hr.

- a. 124 ft/hr
- b.  $9.57 \times 10^{-6}$  ft/hr
- c. .0344 ft/hr
- d. 37800 ft/hr
- e. None of these.

ANSWER: a

POINTS: 1

33. Which of these numbers has the most significant figures?

- a. 0.5071
- b. 0.201
- c.  $6.02 \times 10^{23}$
- d. 51
- e. 103

ANSWER: a

POINTS: 1

34. Solve the problem.

$$3.728 + 6.272$$

- a. 10
- b. 10.0
- c. 10.00
- d. 10.000

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e. 10.0000

ANSWER: d

POINTS: 1

35. Solve the problem.

$$3.72 \times 10^8 \times 9.26 \times 10^{-3}$$

a.  $3.44 \times 10^6$

b.  $4.02 \times 10^{10}$

c.  $3.45 \times 10^5$

d.  $3.44 \times 10^{-4}$

e.  $4.02 \times 10^{-10}$

ANSWER: a

POINTS: 1

36. Solve the problem.

$$1.5 \times 10^3 + 3.14 \times 10^4 - 1.21 \times 10^2 = ?$$

a.  $3.28 \times 10^4$

b.  $3.30 \times 10^3$

c.  $3.3 \times 10^{-4}$

d.  $3.30 \times 10^5$

e.  $3.43 \times 10^9$

ANSWER: a

POINTS: 1

37. Solve the problem.

$$7^6 \left( (5.46 \times 10^5) + 3.13 \times 10^6 \right) \times (7.65 \times 10^3)$$

a.  $65.7 \times 10^{18}$

b.  $130.7 \times 10^{18}$

c.  $4.42 \times 10^{13}$

d.  $2.39 \times 10^{12}$

e.  $65.7 \times 10^8$

ANSWER: c

POINTS: 1

38. Solve the problem.

$$(3.21 \times 10^{10} - 3.13 \times 10^{12}) \div (7.65 \times 10^5)$$

a.  $6 \times 10^4$

b.  $4.13 \times 10^4$

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b.  $2.37 \times 10^{18}$

c.  $65.7 \times 10^{18}$

d.  $-23.7 \times 10^{17}$

e.  $-4.04 \times 10^6$

ANSWER: e

POINTS: 1

39. Solve the problem.

$(12.67 \times 4.23) \div 23.42$

a. 2.3587

b. 2.6334

c. 2.2289

d. 2.8800

e. 2.2884

ANSWER: e

POINTS: 1

40. 0.01% is equivalent to which of the following?

a. 100 ppm

b. 100 ppb

c. 0.000001 ppm

d. 0.000001 ppb

e. None of these.

ANSWER: a

POINTS: 1

41. Which of these is the correct scientific notation for 6,000,220?

a. 5

b.  $6.022 \times 10$

c.  $6.00022 \times 10^5$

d.  $6.00022 \times 10^6$

e.  $6.00022 \times 10^{-5}$

f.  $6.00022 \times 10^{-6}$

ANSWER: c

POINTS: 1

42. Which of the following is correctly written in scientific notation?

a.  $50.0 \times 10^6$

b.  $4.02 \times 10^{216}$

c.  $1 \times 10^{-6.8}$

d.  $1.005 \times 10^{-9.05}$

e.  $10^{-5}$

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ANSWER: b

POINTS: 1

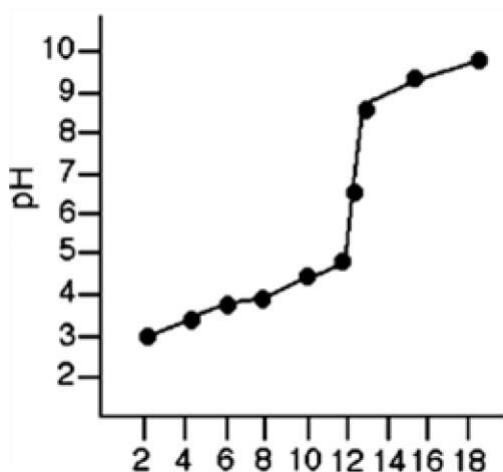
43. Which of these is **incorrectly** matched?

- a. centi c  $10^{-2}$
- b. mega M  $10^6$
- c. milli m  $10^{-3}$
- d. nano n  $10^9$
- e. micro  $\mu$   $10^{-6}$

ANSWER: d

POINTS: 1

Figure 2-1



44. Refer to Figure 2-1. What is the pH of the solution after 8 mL of base have been added.

- a. 3
- b. 4
- c. 6
- d. 7
- e. 8

ANSWER: b

POINTS: 1

45. Refer to Figure 2-1. What affect was there on the pH of the solution when the volume of base added was increased from 8 mL to 13 mL?

- a. The pH dropped by a value of 4.
- b. The pH increased by a value of 4.
- c. The pH remained relatively unchanged.
- d. The pH increased by a value of 10.
- e. The pH increased by a value of 20.

ANSWER: b

POINTS: 1

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46. Refer to Figure 2-1. Which of these statements is **true** based on the data provided by the graph?
- The pH of the solution must be determined algebraically.
  - The pH of the solution is relatively unaffected by the addition of base.
  - The pH of the solution is 7 when approximately 12 mL of base have been added.
  - The pH of the solution is relatively constant with addition of the first 14 mL of base.
  - The pH of the solution rises significantly when the volume is increased from 14 mL to 18 mL.

ANSWER: e

POINTS: 1

47. Which of these numbers has the four significant figures?

- 0.3211
- 0.201
- $6.02 \times 10^{23}$
- 5100
- 0.0103

ANSWER: a

POINTS: 1

48. Solve the problem.

$$131.7 \times 1.05$$

- $1.38 \times 10^3$
- $1.38 \times 10^2$
- $1.3 \times 10^3$
- $1.3 \times 10^3$
- $1.3 \times 10^{-3}$

ANSWER: b

POINTS: 1

49. Solve the problem.

$$33.5 \div 3.011$$

- $1.11 \times 10^1$
- $1.11 \times 10^3$
- $1.113 \times 10^1$
- $1.11 \times 10^2$
- $1.112587 \times$

$10^1$  ANSWER: a

POINTS: 1

50. Which of these is the correct normal decimal notation for  $5.23 \times 10^{-4}$ ?

- 0.0523

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- b. 0.00523
- c. 0.0000523
- d. 0.000523
- e. 52,300

ANSWER: d

POINTS: 1

51. Which of these is the correct normal notation for  $7.77 \times 10^7$  ?
- a. 0.000000777
  - b. 0.0777
  - c. 7,770
  - d. 7,770,000
  - e. 77,700,000

ANSWER: e

POINTS: 1

52. Which of these is the correct normal notation for  $8.14 \times 10^5$  ?
- a. 0.0000814
  - b. 0.000814
  - c. 81.400
  - d. 814,000
  - e. 81,400,000

ANSWER: d

POINTS: 1

53. Which of these series correctly orders the values given from smallest to largest?

- I. 100 cm
  - II. 1 km
  - III. 10 m
  - IV. 100,000 mm
- a. I < II < III < IV
  - b. II < I < IV < III
  - c. I < II = III < IV
  - d. I < IV < III < II
  - e. I < III < IV < II

ANSWER: e

POINTS: 1

54. Which of these series correctly orders the values given from smallest to largest?

- I. 0.001 Mg
  - II. 2,000,000 ng
  - III. 1 Gg
  - IV. 100,000 cg
- a. III < II < I < IV

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- b. II < I < IV < III
- c. II < I = IV < III
- d. I < IV = III < II
- e. I < III < IV < II

ANSWER: c

POINTS: 1

55. Because of the high heat and humidity in the summer in Death Valley, California, a hiker requires about 1 quart of water for every two miles traveled on foot. If the density of water is 0.999 g/mL at 45 °C, how many kilograms of water are required for a person to walk 30 kilometers in Death Valley? (1 L = 1.0567 qt; 1 km = 0.62317 mi)

- a. 8.8 kg
- b. 70 kg
- c. 350 kg
- d. 700 kg
- e.  $8.8 \times 10^3$  kg

ANSWER: a

POINTS: 1

56. A sample of molten iron occupies a volume of  $7.11 \times 10^{-3}$  L. If the density of iron is  $7.86 \text{ g/cm}^3$ , what is the mass of iron in grams in the sample?

- a. 0.000904 g
- b. 0.0559 g
- c. 0.904 g
- d. 1.105 g
- e. 55.8846 g

ANSWER: e

POINTS: 1

57. An irregular shaped piece of metal with a mass of 220 g was placed in a graduated cylinder that contained 35.00 mL of water. This raised the water level to 52.50 mL. What is the density of the metal?

- a. 0.285 g/mL
- b. 4.19 g/mL
- c. 17.5 g/mL
- d. 12.6 g/mL
- e. 38.5 g/mL

ANSWER: d

POINTS: 1

58. An irregular shaped piece of metal with a mass of 105 g was placed in a graduated cylinder that contained 25.00 mL of water. This raised the water level to 45.35 mL. What is the density of the metal?

- a. 0.238 g/mL
- b. 2.3 g/mL
- c. 4.2 g/mL
- d. 5.16 g/mL
- e. 20.35 g/mL



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ANSWER: d

POINTS: 1

59. Convert 4.5 inches to **meters**. (2.54 cm = 1 inch)

- a. 0.1143 m
- b. 1.77 m
- c. 11.43 m
- d. 0.0177 m
- e. 1143 m

ANSWER: a

POINTS: 1

60. Determine the volume in liters of a 1.00 ounce bottle. (1.06 qt = 1 L; 32 ounces = 1 qt)

- a. 0.0295 L
- b. 0.03125 L
- c. 0.03313 L
- d. 30.2 L
- e. 33.9 L

ANSWER: a

POINTS: 1

61. A regulation soccer field is 110.0 yards in length. Calculate the length in millimeters. (1.094 yards = 1 m)

- a. 0.101 mm
- b. 1.01 mm
- c. 100.5 mm
- d.  $1.01 \times 10^4$  mm
- e.  $1.01 \times 10^5$  mm

ANSWER: e

POINTS: 1

62. A 5 foot 7 inch track athlete weighs 110 pounds. What is her height in cm and her weight in kilograms? (2.54 cm = 1 inch; 454 g = 1 pound)

- a. 14.5 cm 242 kg
- b. 152 cm 49.9 kg
- c. 170 cm 49.9 kg
- d. 154 cm 242 kg
- e. 152 cm  $4.99 \times 10^4$  kg

ANSWER: c

POINTS: 1

63. Chemical waste is often shipped in 55-gallon drums. What is the weight in pounds of a 55-gallon drum if the density of the waste is  $1.5942 \text{ g/cm}^3$ ? (454 g = 1 pound; 0.9463 L = 1 quart; 4 quarts = 1 gallon)

- a. 130 lbs
- b. 731 lbs

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c. 810 lbs

d.  $4.5 \times 10^4$  lbs

e.  $5.9 \times 10^4$  lbs

ANSWER: b

POINTS: 1

64. Solve the problem.

$$5.6 \times 10^2 \times 7.41 \times 10^3 = ?$$

a.  $232 \times 10^1$

b.  $7.55 \times 10^5$

c.  $2.32 \times 10^5$

d.  $4.1 \times 10^6$

e.  $232 \times 10^5$

ANSWER: d

POINTS: 1

65. What is the mass in kilograms of a 25.00 pound dumbbell? (454 g = 1 pound)

a.  $1.377 \times 10^3$  kg

b. 1.377 kg

c. 11.35 kg

d.  $1.377 \times 10^3$  kg

e.  $1.135 \times 10^7$  kg

ANSWER: c

POINTS: 1

66. An international group of zookeepers with successful breeding programs made the following animal exchanges last year. Using the same bartering system, how many monkeys can a zoo obtain in exchange for 15 flamingos?

3 oryxes = 1 tiger

2 flamingos = 1 anteater

1 camel = 6 anteaters

5 lemurs = 1 rhino

1 rhino = 4 monkeys

3 lemurs = 1 camel

3 monkeys = 1 tiger

1 rhino = 4 oryxes

a. 3 monkeys

b. 5 monkeys

c. 8 monkeys

d. 12 monkeys

e. 15 monkeys

ANSWER: a

POINTS: 1

67. Which of these samples of aluminum will occupy the **greatest** volume? (Density of aluminum =  $2.70 \text{ g/cm}^3$ ; 454 g = 1 pound)

a. 10,000 g

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- b. 25 pounds
- c. 1 kg
- d.  $5 \times 10^{-2}$  L
- e. 2,000 mL

ANSWER: b

POINTS: 1

68. Which of these samples of water will have the **greatest** mass? (Density of water =  $1.00 \text{ g/cm}^3$ ;  $454 \text{ g} = 1 \text{ pound}$ )

- a. 10,000 g
- b. 25 pounds
- c. 1 kg
- d.  $5 \times 10^{-2}$  L
- e. 2,000 mL

ANSWER: b

POINTS: 1

69. Solve the following equation for y.

$$3y + 24 = 6y - 3$$

- a. 3
- b. 6
- c. 9
- d. 8
- e. 12

ANSWER: c

POINTS: 1

70. Solve the following equation for y.

$$3y = 24$$

- a. 3
- b. 6
- c. 7
- d. 8
- e. 12

ANSWER: d

POINTS: 1

71. Solve the following equation for z.

$$2(z + 6) - 10 = 42$$

- a. 6
- b. 10
- c. 12
- d. 20

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e. 40

*ANSWER:* d

*POINTS:* 1

72. Solve the following equation for z.

$$4z \div 2z + 3 = 30$$

a. 2

b. 6.25

c. 10

d. 11

e. 13.5

*ANSWER:* e

*POINTS:* 1

73. Solve the following equation for x:  $13x = x + 156$

a. 13

b. 20

c. 1

d. 7

e. 12

*ANSWER:* a

*POINTS:* 1