# Chapter 01 - Chemistry - Methods and Measurement (Test Bank) KEY



1. Which is the summary of a large amount of scientific information?

A. hypothesis
B. theory
**C.** scientific law
D. technology
E. scientific method

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

2. What method used by scientists is the systematic approach to the discovery of new information?

A. analytical method
B. hypothetical method
C. chemical method
D. technological method
**E.** scientific method

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

3. What is a hypothesis?

A. a fact that results from extensive experimentation and testing
B. the summary of a large quantity of information
C. the result of a single measurement or observation
**D.** an attempt to explain an observation, or a series of observations
E. an observation of a chemical reaction

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

4. Which statement concerning the scientific method is FALSE?

A. The scientific method is an organized approach to solving scientific problems.
B. The process of explaining observed behavior begins with a hypothesis.
C. Experimentation is conducted to either support or disprove a hypothesis.
**D.** A hypothesis becomes a theory when a single experiment supports it.
E. A theory explains scientific observations and data and can help predict new observations and data.

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

5. What type of change alters the appearance, but not the composition or identity of the substance undergoing the change?

A. theoretical
**B.** physical
C. analytical
D. chemical
E. nuclear

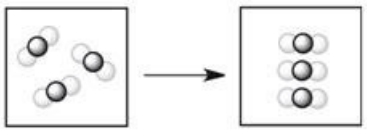
*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

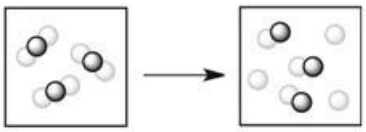
6. Which statement concerning changes in matter is FALSE?

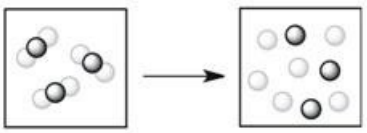
A. A physical change alters the appearance of a substance, but not its identity.
B. A chemical change alters the identity of a substance.
C. A chemical change always results in the production of a new substance.
D. A chemical change is also called a chemical reaction.
**E.** Melting and freezing are chemical changes that change both the appearance of the substance as well as the identity of the substance.

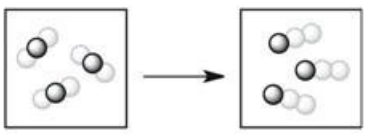
*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

7. Which process depicts a physical change?

**A.**


B.


C.


D.


E. None of the processes above depicts a physical change.

*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

8. What statement best describes an intensive property?

**A.** A property of a substance that does not depend on the quantity of the substance present.
B. A property of a substance that depends on the quantity of the substance present.
C. A property of a substance that depends on the mass of the substance, but not the volume of the substance.
D. A property of a substance that depends on the physical state (solid, liquid, or gas) of the substance.
E. A property of a substance that changes based on the mass of the material that is present.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

9. Which statement concerning the classification of matter is FALSE?

**A.** All matter is either pure substance or a compound.
B. An element is a pure substance that generally cannot be changed into a simpler form of matter.
C. A compound is a pure substance made up of two or more different elements combined in a definite, reproducible way.
D. A pure substance is composed of only one type of component.
E. A mixture is the physical combination of two or more pure substances in which each substance retains its own identity.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

10. When hydrogen ($H_2$) and chlorine ($Cl_2$) gases are mixed, hydrogen chloride (HCl) is produced. Hydrogen chloride is classified as what type of matter?

A. an element
**B.** a compound
C. a homogeneous mixture
D. a heterogeneous mixture
E. a solution

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

11. Which of the following is NOT a type of mixture?

A. homogeneous
B. heterogeneous
C. solution
**D.** compound
E. All of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

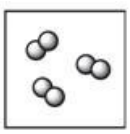
12. Which of the following terms best describes the sample of matter in the diagram? Note: different colored circles represent atoms of different elements.

A. homogeneous mixture
**B.** pure substance
C. heterogeneous mixture
D. solution
E. None of the choices are correct.

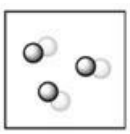
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

13. Which diagram represents a mixture? Note: different colored circles represent atoms of different elements.

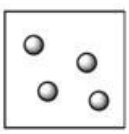
A.



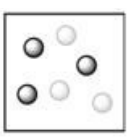
B.



C.



**D.**



*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

14. Which of the following terms is most appropriate when classifying an apple?

A. pure substance
B. compound
**C.** heterogeneous mixture
D. homogeneous mixture
E. solution

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

15. 1 milligram is equivalent to how many grams?

A. 1000
B. 100
C. 0.1
D. 0.01
**E.** 0.001

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI)*
*Topic: Study of Chemistry*

16. A typical aspirin tablet contains 5.00 grains of pure aspirin analgesic compound. The rest of the tablet is starch. How many aspirin tablets can be made from 50.0 g of pure aspirin? [Use: 1.00 g = 15.4 grains]

A. 17 tablets
**B.** 154 tablets
C. 250 tablets
D. 649 tablets
E. 770 tablets

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

17. A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. What mass of the drug should the patient receive? [1 pound = 454 g]

A. 1.47 g
**B.** 2.98 g
C. 3.24 mg
D. 1470 mg
E. 6570 mg

*Accessibility: Keyboard Navigation*
*Bloom's Level: 4. Analyze*
*Difficulty: Hard*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

18. A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. The drug is supplied as a solution that contains 25.0 mg of drug per mL of solution. What volume of the drug should the patient receive? [1 pound = 454 g]

A. 0.579 mL
**B.** 119 mL
C. 362 mL
D. 579 mL
E. 119 L

*Accessibility: Keyboard Navigation*
*Bloom's Level: 4. Analyze*
*Difficulty: Hard*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

19. If one atom of carbon-14 weighs 14.0 atomic mass units and one atomic mass unit is equal to $1.66 \times 10^{-24}$ grams, what is the mass of 25 atoms of carbon-14 in grams?

**A.** $5.81 \times 10^{-22}$
B. $5.81 \times 10^{-21}$
C. 581
D. $2.11 \times 10^{26}$
E. $2.11 \times 10^{-21}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

20. A student records the measurement 4.8 m. What type of measurement was made?

A. mass
B. volume
**C.** length
D. concentration
E. time

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

21. A patient needs 0.300 g of a solid drug preparation per day. How many 10.0 mg tablets must be given to the patient per day?

A. 3 tablets
**B.** 30 tablets
C. 33 tablets
D. 300 tablets
E. 330 tablets

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

22. What is the number 0.0062985632 written in scientific notation to three significant figures?

A. 0.006

B.
$6.00 \times 10^{-3}$

C.
$6.29 \times 10^{-3}$

D.
$6.299 \times 10^{-3}$

**E.**
$6.30 \times 10^{-3}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

23. What is the number 3,000 written in scientific notation using the proper number of significant figures?

A. $0.003 \times 10^{-3}$
B. $0.3 \times 10^{4}$
**C.** $3 \times 10^{3}$
D. $3 \times 10^{-3}$
E. $3.000 \times 10^{3}$

$3 \times 10$

$3 \times 10$

$3.000 \times 10$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

24. What is the number 0.9050 written in scientific notation using the proper number of significant figures?

A. $0.9 \times 10^{4}$

B. $9 \times 10^{-1}$

C. $9.05 \times 10^{-1}$

D. $9.050 \times 10^{4}$

**E.** $9.050 \times 10^{-1}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

25. How should the result of the calculation below be reported using scientific notation and the proper number of significant figures? $(4.3169 \times 10^{4}) \div (2.02 \times 10^{3}) = ?$

**A.** $2.14 \times 10^{1}$

B. $2.1371 \times 10^{1}$

C. $2.14 \times 10^{2}$

D. $2.14 \times 10^{7}$

E. $2.1371 \times 10^{9}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

26. Which of the following measured volumes has the most uncertainty?

**A.** 10 mL
B. 10.0 mL
C. 10.00 mL
D. 10.000 mL
E. All values have the same degree of uncertainty.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

27. Where is the uncertainty in the number 101.2°C?

A. in the ones place
B. in the tens place
**C.** in the tenths place
D. in the hundredths place
E. There is no uncertainty in this number.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

28. A flask contains 145.675 mL of a saline solution. If 24.2 mL of the saline solution are withdrawn from the flask, how should the volume of the saline solution that remains in the flask be reported?

A. 121.475 mL
B. 121.4 mL
**C.** 121.5 mL
D. 122 mL
E. 121 mL

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

29. Which physical property of an astronaut will change depending on whether he or she is on Earth or in orbit?

A. mass
**B.** weight
C. volume
D. all would change
E. none would change

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

30. What is the basic unit of volume in the metric system?

A. milliliter
B. cubic centimeter
**C.** liter
D. gram
E. millimeter

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

31. Which statement concerning energy is FALSE?

**A.** Energy is the amount of heat content in an object.
B. Potential energy is stored energy due to composition or position.
C. Kinetic energy is the energy associated with movement.
D. Heat, light, and electricity are different forms of energy.
E. Conversion of energy from one form to another is possible.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

32. Which temperature would feel the hottest?

**A.** 100°C
B. 100°F
C. 100 K
D. All temperatures would feel equally hot.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 4. Analyze*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

33. A chemical reaction releases 44.3 kJ of heat. What is the equivalent amount of heat expressed in calories? [1 cal = 4.18 J]

A. 10.6 cal
B. 106 cal
C. 185 cal
**D.** 10,600 cal
E. 18,500 cal

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Dimensional Analysis*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

34. A bolder at the top of a hill breaks free and rolls down the hill. Which statement best represents the change in energy that occurs in this process?

A. The potential energy of the bolder increases.
**B.** The potential energy of the bolder is converted to kinetic energy.
C. The kinetic energy of the bolder is converted to potential energy.
D. The chemical energy of the bolder is converted to kinetic energy.
E. No change in energy occurs; energy cannot be converted from one form to another.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

35. What kind of energy is stored as the result of position or composition?

A. kinetic energy
B. activation energy
**C.** potential energy
D. theoretical energy
E. static energy

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

36. The concentration of a patient's blood sugar was determined to be 4850 micrograms per milliliter. Which correctly represents this measurement?

A. 4850 µg /ML
B. 4850 mg/mL
C. 4850 Mg/mL
**D.** 4850 µg/mL
E. 4850 mg/ML

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

37. What is density?

A. the ratio of the number of particles of a substance to the volume of the solution in which it is dissolved
**B.** the ratio of the mass of a substance to the volume of the substance
C. the ratio of the volume of a substance to the mass of the substance
D. the ratio of the moles of a substance to the volume of the solution in which it is dissolved
E. the measure of the amount of heat an object contains

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Topic: Study of Chemistry*

38. If the density of blood is 1.060 g/mL, what is the mass of 6.56 pints of blood? [1 L = 2.113 pints]

**A.** 3.29 kg
B. 329 g
C. 2.93 g
D. 2930 g
E. 2.93 kg

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

39. What is the density of a solid object that has the following measurements?

mass = 189.6 g, length = 9.80 cm, width = 46.6 mm, height = 0.111 m.

A. 0.267 g/mL
**B.** 0.374 g/mL
C. 2.67 g/mL
D. 3.74 g/mL
E. 50.7 g/mL

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

40. Air has an average density of 0.001226 g/mL. What volume of air would have a mass of 1.0 lb? [454 g = 1 pound]

A. 37 mL
B. 370 mL
C. 557 mL
D. $2.7 \times 10^{-6}$ mL
**E.** $3.7 \times 10^{2}$ L

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

41. Which branch of science primarily involves the study of matter and the changes it undergoes?

A. biology
B. technology
C. physics
**D.** chemistry
E. All of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

42. Which of the following terms is defined as anything that has mass and occupies space?

A. chemistry
B. element
**C.** matter
D. compound
E. volume

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

43. In which state does matter have an indefinite shape and definite volume?

A. solid
**B.** liquid
C. gas
D. All of the choices are correct.
E. None of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

44. In which state of matter are forces between particles least dominant?

A. solid
B. liquid
**C.** gas
D. All of the choices are correct.
E. None of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

45. Conversion of ice to liquid water or liquid water to steam is an example of what kind of change?

**A.** physical
B. chemical
C. molecular
D. analytical
E. Both physical and chemical are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

46. What type of change is represented by the decay of a fallen tree?

A. physical
**B.** chemical
C. molecular
D. analytical
E. All of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

47. The green color of the Statue of Liberty is due to a(an) _____ change to the copper metal.

A. elemental
B. physical
C. state
**D.** chemical
E. None of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

48. What type of property of matter is independent of the quantity of the substance?

A. chemical
B. physical
C. extensive
**D.** intensive
E. nuclear

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

49. What are the two classes of pure substances?

A. elements and atoms
B. compounds and molecules
**C.** elements and compounds
D. chemical and physical
E. homogeneous and heterogeneous

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

50. What does the prefix "centi-" mean?

A. $10^{-1}$
**B.** $10^{-2}$
C. $10^{-3}$
D. $10^{2}$
E. $10^{3}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

51. How many centimeters correspond to 15.68 kilometers?

**A.** $1.568 \times 10^{6}$ cm
B. $1.568 \times 10^{5}$ cm
C. $1.568 \times 10^{-4}$ cm
D. 1568 cm
E. 1.569 cm

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

52. How many pounds are represented by 764.6 mg? [1 pound = 454 g]

A. 347.1 lb
B. $3.471 \times 10^{8}$ lb
**C.** $1.684 \times 10^{-3}$ lb
D. 1.684 lb
E. 0.7646 lb

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

53. If a person smokes 10.0 packs of cigarettes a week and each cigarette contains 5.00 mg of tar, how many years will she have to smoke to inhale 0.250 pounds of tar? [20 cigarettes = 1 pack, 1 pound = 454 g and 1 year = 52 weeks]

**A.** 2.18 y
B. $2.18 \times 10^{-2}$ y
C. 1.06 y
D. 28.6 y
E. 0.556 y

*Accessibility: Keyboard Navigation*
*Bloom's Level: 4. Analyze*
*Difficulty: Hard*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

54. The cost of a drug is 125 francs per gram. What is the cost in dollars per ounce? [$1 = 6.25 francs and 1 ounce = 28.4 g]

A. $0.70/oz
**B.** $568/oz
C. $27.5/oz
D. $2.22 × $10^4$/oz
E. $4.65/oz

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

55. How many significant figures does the number $5.06305 \times 10^4$ contain?

A. 4
B. 5
**C.** 6
D. 7
E. 9

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

56. Provide the answer to the following problem using scientific notation and the proper number of significant digits: $(6.00 \times 10^{-2})(3.00 \times 10^{-4}) = ?$

A. $1.8 \times 10^{-5}$

**B.** $1.80 \times 10^{-5}$

C. $1.80 \times 10^{-4}$

D. $18.00 \times 10^{-4}$

E. $2 \times 10^{-5}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

57. A student measures the mass of three separate samples of a solid: 104.45 g, 0.838 g, and 46 g. If the student mixes all three samples together, how should the total mass be properly reported?

A. 151.288
B. 151.28
C. 151.29
**D.** 151
E. $1.5 \times 10^2$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

58. Which measurement represents the largest volume?

**A.** 4.6 L
B. $4.6 \times 10^{-3}$ L
C. 46 cL
D. 460 mL
E. All represent the same volume.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 4. Analyze*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Dimensional Analysis*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

59. What term is used to describe the summary of a large quantity of information?

A. hypothesis
B. theory
**C.** law
D. model
E. result

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

60. Which state of matter has neither a definite shape nor a definite volume?

A. liquid
B. solid
C. gas
D. vapor
**E.** Both gas and vapor are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

61. Which of the following is NOT a physical property of matter?

A. odor
B. compressibility
**C.** flash point
D. melting point
E. color

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

62. The distance between two hydrogen atoms in a hydrogen molecule ($H_2$) is $7.461 \times 10^{-11}$. What is the equivalent distance expressed in inches? [2.54 cm = 1 in]

A. $2 \times 10^{-9}$ in

B. $1.895 \times 10^{-12}$ in

C. $294 \times 10^{-11}$ in

**D.** $2.937 \times 10^{-9}$ in

E. $2.94 \times 10^{-8}$ in

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

63. What kind of change always results in the formation of new materials?

A. molecular
B. exothermic
C. endothermic
D. physical
**E.** chemical

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

64. Which of the following is a chemical property?

**A.** flammability
B. color
C. hardness
D. temperature
E. melting point

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

65. Which one of the following is an example of an extensive property?

A. density
B. specific gravity
**C.** mass
D. hardness
E. boiling temperature

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

66. Which one of the following is an example of a pure substance?

**A.** ethyl alcohol
B. sugar water
C. salt and pepper
D. milk
E. sand

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

67. Air is a/an

A. element.
B. compound.
**C.** mixture.
D. molecule.
E. pure substance.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

68. The speed of light is 186,000 miles per second. What is its speed in centimeters per second? [5280 feet = 1 mile; 12 inches = 1 foot; 2.54 cm = 1 inch]

A. $3.01 \times 10^{11}$ cm/s
B. $3.15 \times 10^{10}$ cm/s
C. $6.06 \times 10^{12}$ cm/s
D. $3 \times 10^{11}$ cm/s
**E.** $2.99 \times 10^{10}$ cm/s

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

69. 1 centimeter equals how many millimeters?

A. $10^{-6}$
B. $10^{-3}$
**C.** 10
D. $10^{4}$
E. $10^{6}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Dimensional Analysis*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

70. Round 0.052018 to three significant figures.

A. 0.05
B. 0.052
**C.** 0.0520
D. 0.05201
E. 0.05202

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

71. Select the answer that best expresses the result of the following calculation: 1.86 + 246.4 - 79.9208 = ?

A. 168
**B.** 168.3
C. 168.34
D. 168.339
E. 168.3392

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

72. What is the appropriate number of significant figures necessary to express the result of the calculation below? (51.6) × (3.1416)

A. 1
B. 2
**C.** 3
D. 4
E. 5

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

73. What Celsius temperature corresponds to -4.6°F?

A. -20°C

**B.** -20.3°C

C. -23.0°C

D. -10.9°C

E. -68.4°C

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

74. What Fahrenheit temperature corresponds to -40.0°C?

A. -8°F
B. 16.8°F
C. -36.9°F
**D.** -40.0°F
E. -1.94°F

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

75. What Kelvin temperature corresponds to 98.6°F?

A. 310 K
**B.** 310.2 K
C. 31.00 K
D. 132.0 K
E. 199 K

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

76. Which temperature scale does not use a degree sign?

A. Celsius
**B.** Kelvin
C. Centigrade
D. Fahrenheit
E. Absolute zero

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

77. If the density of carbon tetrachloride is 1.59 g/mL, what is the volume in L, of 4.21 kg of carbon tetrachloride?

A. 0.149 L
B. 0.378 L
**C.** 2.65 L
D. 6.69 L
E. 6690 L

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Hard*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

78. What is the specific gravity of an object that weighs 13.35 g and has a volume of 25.00 mL? The density of water under the same conditions is 0.980 g/mL.

A. 1.335
B. 0.545 g/mL
C. 0.534 g/mL
**D.** 0.545
E. 0.980

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Topic: Study of Chemistry*

79. Which of the following is FALSE concerning the gas state?

A. Gases have no definite shape.
B. Gases have no definite volume.
C. Particles are far apart from each other.
**D.** Particles are usually in a regular or organized pattern.
E. When gas molecules collide, they do not lose energy.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

80. Which of the following is an example of physical change?

**A.** boiling water
B. burning paper
C. a metal losing electrons to become a cation
D. cooking eggs
E. lighting a match

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Changes in Matter*
*Topic: Study of Chemistry*

81. Which statement is FALSE?

A. Mass is an example of an extensive property.
B. Volume is an example of an extensive property.
C. Temperature is an example of an intensive property.
D. An intensive property is one that does not depend upon the amount of the substance.
**E.** An extensive property is synonymous with a physical property.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Properties of Matter*
*Topic: Study of Chemistry*

82. NaCl is best classified as a/an

A. pure substance.
B. element.
C. compound.
D. homogeneous mixture.
**E.** Both pure substance and compound are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.02*
*Subtopic: Classification and States of Matter*
*Topic: Study of Chemistry*

83. Which of the following numbers has only one significant figure?

A. $3.0 \times 10^{1}$
**B.** 0.003
C. 3.00
D. 30.0
E. All of the choices are correct.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

84. Give the answer to the following calculation to the correct number of significant figures. $(5.0 \times 10^{-4}) - (6 \times 10^{-5}) = ?$

**A.** $4.4 \times 10^{-4}$

B. $4.4 \times 10^{-5}$

C. $4 \times 10^{-4}$

D. $4 \times 10^{-5}$

E. $4.40 \times 10^{-4}$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

85. The area of a rectangle is determined by the formula: area = length × width. If a rectangle has a length of 32.6 cm and a width of 72.6 cm, what is the area of the rectangle to the correct number of significant figures?

A. 2,400 $cm^2$
**B.** 2,370 $cm^2$
C. 2,367 $cm^2$
D. 2,366.8 $cm^2$
E. 2,366.76 $cm^2$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

86. Consider the following set of numbers. If the true value is 12.6 $cm^2$, which of the following best describes the set of numbers?
12.6 $cm^2$, 12.5 $cm^2$, 12.6 $cm^2$

A. accurate but not precise
B. not accurate but precise
**C.** accurate and precise
D. neither accurate nor precise
E. More information is needed to determine if the measurements are accurate.

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

87. How many cm are in $3.5 \times 10^{-2}$ km?

A. $3.5 \times 10^{-1}$ cm
B. $3.5 \times 10^{-7}$ cm
C. $3.5 \times 10^{2}$ cm
D. $3.5 \times 10^{5}$ cm
**E.** $3.5 \times 10^{3}$ cm

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

88. Tire pressure in the U.S. is measured in $lb/in^2$. Convert 25 $lb/in^2$ to $g/cm^2$. 454 g = 1 lb, 2.54 cm = 1 in

A. 0.39 $g/cm^2$
**B.** $1.8 \times 10^{3}$ $g/cm^2$
C. $4.7 \times 10^{3}$ $g/cm^2$
D. $3.0 \times 10^{4}$ $g/cm^2$
E. $2.4 \times 10^{2}$ $g/cm^2$

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.05*
*Subtopic: Dimensional Analysis*
*Topic: Study of Chemistry*

89. What volume, in milliliters, will 2.00 g of air occupy if the density is 1.29 g/L?

**A.** $2.72 \times 10^{3}$ mL
B. 2.20 mL
C. 1.43 mL
D. $1.55 \times 10^{3}$ mL
E. $4.59 \times 10^{2}$ mL

*Accessibility: Keyboard Navigation*
*Bloom's Level: 3. Apply*
*Difficulty: Medium*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Topic: Study of Chemistry*

90. Concentration is a measure of the number or mass of particles of a substance that are contained in a specified volume.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

91. Hypotheses are not acceptable in the scientific method.

**FALSE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

92. In the scientific method, a law carries more weight than a hypothesis.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

93. Each piece of data is the individual result of a single measurement.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.01*
*Subtopic: Scientific Method*
*Topic: Study of Chemistry*

94. The presence of some error is a natural consequence of any measurement.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

95. The number 0.0680 has 3 significant figures.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.04*
*Subtopic: Scientific Notation and Significant Figures*
*Topic: Study of Chemistry*

96. The terms mass and weight are identical.

**FALSE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

97. Mass is the force resulting from the pull of gravity upon an object.

**FALSE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.03*
*Subtopic: Measurements (Metric and SI Units)*
*Topic: Study of Chemistry*

98. Equal masses of glass and steel at the same temperature will have different heat energies.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

99. Energy may be defined as the heat content of an object.

**FALSE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

100. One calorie is the amount of energy needed to raise the temperature of one gram of water one degree Celsius.

**TRUE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 1. Remember*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Temperature*
*Topic: Study of Chemistry*

101. Density and specific gravity can be expressed in the same units.

**FALSE**

*Accessibility: Keyboard Navigation*
*Bloom's Level: 2. Understand*
*Difficulty: Easy*
*Gradable: automatic*
*Section number: 01.06*
*Subtopic: Density and Specific Gravity*
*Topic: Study of Chemistry*

# Chapter 01 - Chemistry - Methods and Measurement (Test Bank)

## Summary

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| Gradable: automatic | 101 |
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