

This practice test is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test. **Please time yourself! This practice test should take a maximum of 55 minutes to ensure you are going fast enough to finish the actual Test in class!**

1. Which of the following electron configurations represent Ti^{4+}
- A) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 4d^{10}$
 - B) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^8$
 - C) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$
 - D) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 4d^8 5p^2$

2. Which of the following is a physical change?
- A) rusting iron
 - B) decomposing meat
 - C) burning gasoline
 - D) cooking an egg
 - E) evaporating water

3. A particular radioactive element has a half life of 2.00 weeks. What percent of the original sample is left after 23.5 days?
- A) 1.68%
 - B) 68.8%
 - C) 31.2%
 - D) 66.2%
 - E) none of these

4. Amount of sample	Time
45.00g	0 min
31.82g	2 min
22.50g	4 min
15.91g	6 min
11.25g	8 min

What is the half life of the sample element above?

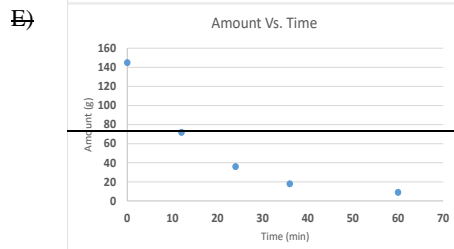
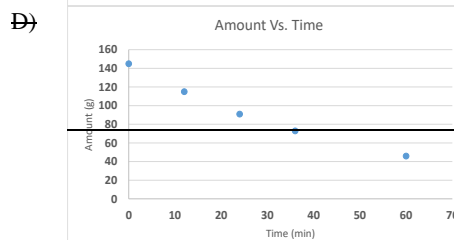
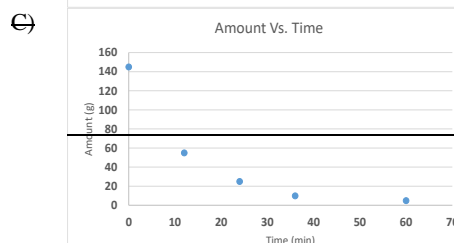
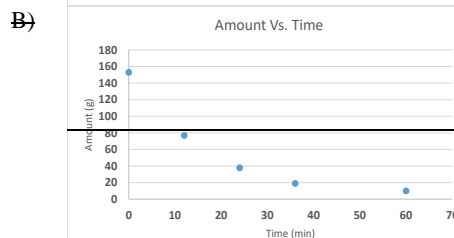
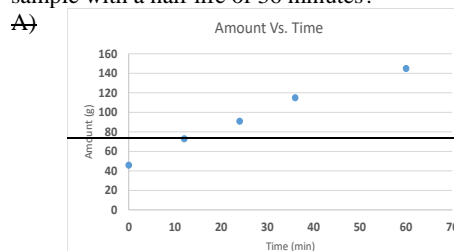
- A) 8 min
- B) 6 min
- C) 3 min
- D) 4 min
- E) 2 min

5. Which of the following when in ion form would have the same electron configuration as a fluorine ion?
- A) K
 - B) Na
 - C) He
 - D) Ar
 - E) S

6. The half life of a radioactive nuclide is
- A) the period of time it takes to reduce the radioactivity by 100%.
 - B) that period of time in which 25% of the original number of atoms undergoes radioactive decay.
 - C) the time at which the isotope becomes nonradioactive.
 - D) that period of time in which 50% of the original number of atoms undergoes radioactive decay.
 - E) none of the above

7. Compared to a Barium ion, which of the following ions would have the same number of total electrons?
- A) Pb^{4+}
 - B) Sn^{2+}
 - C) I^-
 - D) Pb^{2+}
 - E) Br^-

8. Which graph below represents the decay of a 145g sample with a half life of 36 minutes?



9. A _____ change involves a change in one or more physical properties, but no change in the fundamental components that make up the substance.
- A) potential
 - B) mixed
 - C) chemical
 - D) kinetic
 - E) physical

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10. An atom with 15 protons and 16 neutrons is an atom of
- A) S
 - B) Rh
 - C) Pd
 - D) Ga
 - E) P

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11. Which of these is a chemical property?
- A) Helium is very nonreactive.
 - B) Water has a high specific heat.
 - C) Sodium is a soft, shiny metal.
 - D) Oxygen is a gas.
 - E) Ice melts at 0°C.

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12. How many protons, electrons, and neutrons, respectively, does ^{127}I have?
- A) 53, 74, 53
 - B) 53, 53, 127
 - C) 53, 53, 74
 - D) 53, 127, 74
 - E) 74, 53, 127

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13. Which of the following statements are **true**?
- I. Models are always wrong unless they are proved by a theory.
 - II. Elements, such as lead, are made of tiny particles that mostly consist of open space.
 - III. The air you breathe is an example of a heterogeneous mixture.
 - IV. Because NH_3 always contains the same relative numbers of atoms, it will always contain 4.6 g of nitrogen for every 1.0 g of hydrogen.
- A) I, III
 - B) II only
 - C) II, IV
 - D) I, II, IV
 - E) All of the above statements are true.

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14. A walker travels a distance of 1.4 miles. How many inches did the walker travel?
(1 mi = 5280. ft)
(1 ft = 12 in)
- A) 8.9×10^4 in
 - B) 17. in
 - C) 7.4×10^3 in
 - D) 6.2×10^2 in
 - E) 8.6 in

15. The chemical formula Al_2O_3 indicates
- A) six atoms of each element
 - B) five atoms of each element
 - C) three atoms of aluminum and two atoms of oxygen
 - D) two atoms of aluminum and three atoms of oxygen
 - E) None of these is correct.

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16. How many phosphorus atoms are represented by one formula unit of calcium phosphate, $\text{Ca}_3(\text{PO}_4)_2$?
- A) 9
 - B) 12
 - C) 6
 - D) 18
 - E) 3

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17. An example of a pure substance is
- A) carbon dioxide
 - B) pure water
 - C) elements
 - D) compounds
 - E) all of these

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18. Which of the following is an element?
- A) sugar
 - B) helium
 - C) air
 - D) salt
 - E) water

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19. What element has the following electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$?
- A) Cu
 - B) Mn
 - C) Mo
 - D) Cr
 - E) V

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20. How many hydrogen atoms are indicated by the formula $(\text{NH}_4)_2\text{C}_8\text{H}_4\text{O}_2$?
- A) 20
 - B) 24
 - C) 12
 - D) 8
 - E) none of these

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21. The iodine-131 nuclide has a half life of 8.0 days. If you originally have a 651-g sample, after 2.0 months you will have (Ignore significant figures for this problem. Assume one month is 30 days)
- A) 125-g
 - B) 3.6-g
 - C) 56-g
 - D) less than 1-g
 - E) 48-g

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22. The maximum number of electrons allowed in each of the d orbitals is
- A) 18
 - B) 32
 - C) 4
 - D) 10
 - E) 2

23. Which of the below noble gas electron configurations is correct?

- A) [Kr] 4s²3d¹⁰4p⁵
- B) [Ar] 3s²2d¹⁰3p⁵
- C) [Ar] 4s²4d¹⁰4p⁵
- D) [Ne] 4s²3d¹⁰4p⁵
- E) [Ar] 4s²3d¹⁰4p⁵

24. Which of the following is a chemical change?

- A) A damp towel dries.
- B) Peanuts are crushed.
- C) A "tin" can rusts.
- D) Water condenses on a mirror.
- E) At least two of the above (a-d) exhibit a chemical change.

25. The symbol for the element bromine is

- A) Be
- B) Bn
- C) B
- D) Bro
- E) Br

26. An example of a mixture is

- A) purified water
- B) the air in this room
- C) hydrogen fluoride
- D) gold
- E) all of these

27. A homogeneous mixture is also called _____.

- A) a pure substance.
- B) an element.
- C) a heterogeneous mixture.
- D) a compound.
- E) a solution.

28. An object has a mass of 40.1 g and occupies a volume of 6.61 mL. The density of this object is

- A) 0.165 g/mL
- B) 6.07 g/mL
- C) too low to measure
- D) 40.1 g/mL
- E) 265 g/mL

29. Which of the following is a chemical change?

- A) sugar dissolving in water
- B) butter melting
- C) water boiling
- D) paper burning
- E) gasoline evaporating

30. A solution of Copper Sulfate is put into **blue flame** and a green color appears. The same solution of Copper was put into a **yellow flame** and there was no color change. Which of the following best explains this phenomena?

- A) Insufficient amount of energy of the yellow flame
- B) Error in solution
- C) Sufficient amount of energy in the yellow flame
- D) Insufficient amount of energy of the blue flame

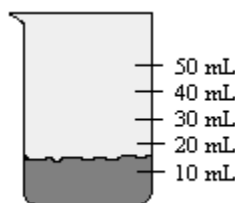
31. Which of the following involves no chemical change?

- A) boiling water
- B) baking a cake
- C) driving a car
- D) burning paper
- E) lighting a match

32. A _____ change involves a change in the fundamental components of the substance; a given substance changes into a different substance or substances.

- A) kinetic
- B) potential
- C) chemical
- D) mixed
- E) physical

33. You take 20.0 mL of water from a graduated cylinder and add it to the beaker of water below. What is the new volume of water in the beaker?



- A) 35 mL
- B) 25.0 mL
- C) 35.0 mL
- D) 40. mL
- E) 40 mL

34. Which of the following processes require(s) chemical methods?

- A) Separating a heterogeneous mixture into pure substances.
- B) At least two of the above (a-d) require chemical methods.
- C) Breaking a compound into its constituent elements.
- D) Separating a homogeneous mixture into pure substances.
- E) Distilling a saltwater mixture.

35. Which of the following processes is a chemical change?

- A) Liquid nitrogen dumped onto the floor vaporizes at room temperature.
- B) Dry ice sublimates when left on the demo table in lecture.
- C) The light on a candle burns until a bell jar is placed over it for a period of time.
- D) When a few drops of red food coloring are added to a beaker of hot water, the water immediately turns red.
- E) None of the above processes are chemical changes.

36. A particular radioactive element has a half life of 1.20 years. What percent of the original sample is left after 171.4 days?
- A) ~~25.4%~~
B) ~~38.1%~~
C) ~~23.8%~~
D) ~~17.0%~~
E) ~~76.2%~~

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37. Which metric prefix is used to designate 1000?
- A) k
B) d
C) M
D) m
E) c

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38. The symbol for the element strontium is
- A) Sm
B) S
C) Str
D) Sr
E) St

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39. Which particle has the smallest mass?
- A) helium nucleus
B) electron
C) neutron
D) proton

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40. How many protons, electrons, and neutrons, respectively, does ^{16}O have?
- A) 8, 18, 16
B) 8, 10, 8
C) 8, 14, 8
D) 8, 18, 8
E) 8, 8, 8

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41. Perform the following conversion:
 $5.84 \text{ m/s} = \text{mi/h}$ ($1\text{m} = 39.37\text{in}$; $1\text{mi} = 5280\text{ft}$)
- A) 218. mi/h
B) 276. mi/h
C) 11.7 mi/h
D) 13.1 mi/h
E) 0.383 mi/h

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42. 5.7 kilogram(s) contains this many grams:
- A) 0.57
B) 57
C) 5.7×10^2
D) 5.7×10^{-3}
E) 5.7×10^3

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43. The measurement $8.2 \times 10^3 \text{ g}$ also could be written as
- A) 8.2 dg
B) 8.2 g
C) 8.2 kg
D) 8.2 mg
E) 8.2 pg

44. Which of the following describes a chemical property of gold?
- A) Gold is an inert (nonreactive) metal.
B) Gold is a soft metal.
C) Gold is a good conductor of heat and electricity.
D) Gold is a yellow metal.
E) Gold is a very dense metal.

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45. A certain isotope X^+ contains 54 electrons and 78 neutrons. What is the mass number for this element?
- A) 55
B) 133
C) 53
D) 131
E) 132

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46. The symbol Cs stands for the element
- A) calcium
B) cesium
C) cadmium
D) curium
E) carbon

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47. A sample of a radioactive element decays to 25.1% of its original amount of radioactive nuclides in 15 years. What is the half life of this radioactive element?
- A) ~~92.5 years~~
B) ~~36. years~~
C) ~~2.8 years~~
D) ~~9.2 years~~
E) ~~7.5 years~~

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48. The symbol for the element zinc is
- A) Zc
B) Zi
C) Zin
D) Z
E) Zn

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49. How many of the following are pure compounds? sodium, sugar, oxygen, air, iron
- A) 3
B) 4
C) 2
D) 5
E) 1

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50. The Br-82 nucleus has a half life of about 1.0×10^3 minutes. If you wanted 3.3 g of Br-82 and the delivery time was three days, about how much Br should you order?
- A) ~~9.2 g~~
B) ~~85 g~~
C) ~~66 g~~
D) ~~3.3 g~~
E) ~~4.4 g~~

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51. Which of the following represents the correct noble gas configuration of the element Mercury?
- A) $[\text{Xe}]6s^25d^{10}$
B) $[\text{Xe}]6s^24f^{14}4d^{10}$
C) $[\text{Rn}]6s^24f^{14}5d^{10}$
D) $[\text{Xe}]6s^24f^{14}5d^{10}$

52. How many of the following did Dalton not discuss in his atomic theory?
 isotopes
 ions
 protons
 electrons
 neutrons
 A) 5
 B) 1
 C) 4
 D) 2
 E) 3

53. The symbol Ga stands for the element
 A) gold
 B) gadolinium
 C) germanium
 D) gallium
 E) none of these

54. The state of matter for an object that has neither definite shape nor definite volume is
 A) mixed
 B) gaseous
 C) elemental
 D) solid
 E) liquid

55. The element curium ($Z = 242, A = 96$) can be produced by positive-ion bombardment when an alpha particle collides with which of the following nuclei? Recall that a neutron is also a product of this bombardment.
 A) ${}_{95}^{241}\text{Am}$
 B) ${}_{94}^{239}\text{Pu}$
 C) ${}_{92}^{239}\text{U}$
 D) ${}_{94}^{241}\text{Pu}$
 E) ${}_{98}^{249}\text{Cf}$

Answer Key

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|-------|-------|-------|
| 1. A | 20. C | 39. B |
| 2. E | 21. B | 40. E |
| 3. C | 22. E | 41. D |
| 4. D | 23. E | 42. E |
| 5. B | 24. C | 43. C |
| 6. D | 25. E | 44. A |
| 7. C | 26. B | 45. B |
| 8. D | 27. E | 46. B |
| 9. E | 28. B | 47. E |
| 10. E | 29. D | 48. E |
| 11. A | 30. A | 49. E |
| 12. C | 31. A | 50. C |
| 13. C | 32. C | 51. D |
| 14. A | 33. A | 52. A |
| 15. D | 34. C | 53. D |
| 16. E | 35. C | 54. B |
| 17. E | 36. E | 55. B |
| 18. B | 37. A | |
| 19. B | 38. D | |

Total Time Used:

_____/55min

Score:

_____/47 Qs

% Correct

_____%

Types of Qs or Topics Missed:

Study Plan: