

***21st Century Chemistry 2nd edition Waldron Test
Bank***

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Chapter 2

1. Who was the first person to have a part of his/her body X-rayed?

- a. Marie Curie
- b. Anna Röntgen
- c. Dmitri Mendeleev
- d. Bertha Wilhelm

ANSWER: b

2. Which is defined as the emission of energy?

- a. beta particles
- b. radiation
- c. electron smear
- d. X-rays

ANSWER: b

3. Which of the following can break down atoms?

- a. chemical reactions
- b. radiation
- c. nuclear means
- d. exposure to X-rays

ANSWER: c

4. _____ matter is attracted to or repelled by other matter.

- a. Heavy
- b. Microscopic
- c. Isotopic
- d. Charged

ANSWER: d

5. If the diameter of an atom is likened to the distance between San Francisco and Washington, D.C., the size of the nucleus of this atom would be equivalent to

- a. the state of Rhode Island.
- b. the city of Denver.
- c. a store in Kansas.
- d. a hair on the head of a person in Illinois.

ANSWER: c

6. A negatively charged particle located in the cloud like smear of negative charge of an atom is called a(n)

- a. proton.
- b. nucleus.
- c. electron.
- d. neutron.

Chapter 2

ANSWER: c

7. Which element is the only element to contain only one proton?

- a. helium
- b. carbon
- c. neon
- d. hydrogen

ANSWER: d

8. Which statement is false?

- a. The nucleus contains the protons and neutrons.
- b. The number of neutrons in an element is found by subtracting the number of protons from the atomic mass listed under each symbol on the periodic table.
- c. The number of electrons in a neutral atom will be equal to the number of protons.
- d. The neutron is located in the nucleus and takes up very little space inside the nucleus. Neutrons and protons have about the same mass.

ANSWER: b

9. Although the nucleus takes up a very small portion of the volume of an atom, each particle in the nucleus is about _____ times more massive than an electron.

- a. 10
- b. 100
- c. 2000
- d. 5 million

ANSWER: c

10. A neutral atom containing 8 protons will contain how many electrons?

- a. 2
- b. 4
- c. 8
- d. 16

ANSWER: c

11. An element is defined by the number of _____ it contains.

- a. electrons
- b. protons
- c. neutrons
- d. nuclei

ANSWER: b

12. The atomic number of an element is equal to the number of _____ that element contains.

- a. electrons

Chapter 2

- b. protons
- c. neutrons
- d. isotopes

ANSWER: b

13. A neutral atom of sulfur will contain how many electrons?

- a. 32
- b. 6
- c. 15
- d. 16

ANSWER: d

14. How many electrons does a neutral atom of phosphorus contain?

- a. 3
- b. 30
- c. 31
- d. 15

ANSWER: d

15. At the time your textbook was written, there were _____ known different elements.

- a. 58
- b. 114
- c. 2125
- d. 6.02×10^{23}

ANSWER: b

16. Organize these elements from least number of protons to most: chromium, magnesium, arsenic, oxygen.

- a. oxygen, magnesium, chromium, arsenic
- b. magnesium, chromium, arsenic, oxygen
- c. oxygen, arsenic, chromium, magnesium
- d. arsenic, chromium, oxygen, magnesium

ANSWER: a

17. The element that has 76 protons in its nucleus is called

- a. arsenic.
- b. osmium.
- c. thallium.
- d. hafnium.

ANSWER: b

18. The scientist credited with bringing the metric system to Russia was

Chapter 2

- a. Marie Curie.
- b. Wilhelm Röntgen.
- c. Anna Bertha.
- d. Dmitri Mendeleev.

ANSWER: d

19. The name of the element whose atomic number is 22 is

- a. titanium.
- b. sodium.
- c. neon.
- d. tin.

ANSWER: a

20. What is the name of the element that contains 31 protons?

- a. antimony
- b. gallium
- c. phosphorus
- d. germanium

ANSWER: b

21. Write the name and symbol for the element with atomic number 51.

- a. antimony, Sb
- b. palladium, Pd
- c. cerium, Ce
- d. magnesium, Mg

ANSWER: a

22. All of the elements after atomic number _____ are artificial and do not exist in nature.

- a. 57
- b. 89
- c. 92
- d. 104

ANSWER: c

23. What is the atomic symbol for the element sodium?

- a. S
- b. So
- c. Na
- d. Dm

ANSWER: c

Chapter 2

24. Isotopes of an element differ in the number of _____ that they contain.

- a. electrons
- b. neutrons
- c. protons
- d. atoms

ANSWER: b

25. Identify the element that contains the following number of protons and neutrons: 36 protons and 48 neutrons.

- a. Kr
- b. Cd
- c. Po
- d. Mg

ANSWER: a

26. Identify the element that contains the following number of protons and neutrons: 29 protons and 35 neutrons.

- a. I
- b. Br
- c. Gd
- d. Cu

ANSWER: d

27. Identify the number of protons and neutrons in an atom of chromium.

- a. 24 protons, 28 neutrons
- b. 28 protons, 24 neutrons
- c. 52 neutrons, 24 protons
- d. 52 protons, 28 neutrons

ANSWER: a

28. Isotopes of which element were used to determine the source of the marble used in the Parthenon?

- a. oxygen
- b. carbon
- c. chlorine
- d. calcium

ANSWER: a

29. How many neutrons, protons and electrons are in an atom of Eu-153?

- a. 63 protons, 63 electrons, 90 neutrons
- b. 153 protons, 63 electrons, 63 neutrons
- c. 152 electrons, 153 electrons, 63 neutrons

Chapter 2

- d. 90 electrons, 90 protons, 63 neutrons

ANSWER: a

30. In an atom, which particles are most likely to participate in chemical reactions?

- a. the protons
- b. the core electrons
- c. the valence electrons
- d. the neutrons

ANSWER: c

31. What are the maximum number of electrons that can exist in the second energy level?

- a. 2
- b. 8
- c. 10
- d. 18

ANSWER: b

32. What determines how far from the ground state an electron will jump when energy is added to an atom?

- a. the size of the atom
- b. the number of electrons in the atom
- c. the amount of energy added to the atom
- d. the number of atoms in a certain sample

ANSWER: c

33. Which of the following types of electromagnetic radiation is the most energetic?

- a. radio waves
- b. visible light
- c. ultraviolet light
- d. infrared light

ANSWER: c

34. An "EMR blocker" blocks

- a. electrons making rays.
- b. electromagnetic radiation.
- c. exceptional magnetic responses.
- d. extraneous machine relays.

ANSWER: b

35. Which type of visible light would have the shortest wavelength light?

- a. yellow
- b. blue

Chapter 2

- c. red
- d. green

ANSWER: b

36. The Energy Independence and Security Act of 2007 stated that
- a. cars produced after 2007 must get at least 35 mpg.
 - b. incandescent bulbs that do not meet certain energy efficiency requirements must be phased out by 2014.
 - c. the U.S. must import less than 50% of its oil by the year 2020.
 - d. each state must produce at least 40% of its electricity from renewable sources by the year 2015.

ANSWER: b

37. Rank the following from shortest to longest wavelength: microwaves, yellow light, X-rays, gamma rays.
- a. X-rays, gamma rays, yellow light, microwaves
 - b. microwaves, yellow light, X-rays, gamma rays
 - c. gamma rays, X-rays, yellow light, microwaves
 - d. yellow light, microwaves, gamma rays, X-rays

ANSWER: c

38. Choose the true statement.
- a. When light is absorbed by an atom, electrons move from a higher energy to a lower energy level.
 - b. When light is emitted by an atom, electrons move from a higher energy to a lower energy level.
 - c. Sunlight produces light at distinct locations in a line spectrum.
 - d. The colors in a rainbow include all wavelengths of the electromagnetic spectrum.

ANSWER: b

39. Yellow light has a wavelength of about 655 nm. Electromagnetic radiation whose wavelength is 455 nm would most likely belong to
- a. radio waves.
 - b. X-rays.
 - c. violet light.
 - d. infrared light.

ANSWER: c

40. Incandescent light bulbs
- a. have not been produced since 2010.
 - b. will be phased out of production starting in 2020.
 - c. have been manufactured worldwide since just before the first World War.
 - d. will be used to replace less energy efficient LED type bulbs.

ANSWER: a

Chapter 2

41. Cell phones emit radiation that is of similar frequency to

- a. X-rays.
- b. microwaves.
- c. visible light.
- d. radio waves.

ANSWER: d

42. Which statement is true?

- a. High energy electromagnetic radiation has very long wavelengths.
- b. Electromagnetic radiation that has very short wavelengths is the least dangerous to humans.
- c. Cell phone radiation is considered ionizing radiation.
- d. A computer emits lower energy radiation than a cell phone.

ANSWER: d

43. Cell phones communicate with cell phone towers using

- a. microwave radiation.
- b. visible light.
- c. infrared light.
- d. radio waves.

ANSWER: d

44. Electrons can be promoted from a low energy level to a higher one

- a. by adding electricity to the atom.
- b. by exposing the atom to any type of light.
- c. by vigorously shaking a sample of atoms.
- d. by dissolving a sample of atoms in water.

ANSWER: a

45. When electrons in an atom are in their lowest possible energy state, they are said to be

- a. unionized.
- b. in the ground state.
- c. non-reactive.
- d. part of a line spectrum.

ANSWER: b

46. Street lamps that give off yellow light are most often filled with atoms of what element?

- a. mercury
- b. lithium
- c. sodium
- d. chlorine

ANSWER: c

Chapter 2

47. An atom of a particular element is energized and promoted to a higher energy level. The electron later relaxes back to its original state and emits electromagnetic radiation that has a wavelength of 1050 nm. You were observing this occurrence but did not detect any light being emitted. What is the most likely reason that you did not observe any light?

- a. The process happened too fast.
- b. The electrons are too small to see.
- c. The wavelength that was emitted is outside the visible range of light.
- d. The wavelength that was emitted caused the emission of radio waves, which you would have had to hear rather than see.

ANSWER: c

48. The term "light" refers to

- a. visible light that humans can observe with the naked eye.
- b. all types of electromagnetic radiation.
- c. sunlight.
- d. non-ionizing radiation.

ANSWER: b

49. Which type of electromagnetic radiation is associated with heat?

- a. X-rays
- b. gamma rays
- c. visible light
- d. infrared light

ANSWER: d

50. Electromagnetic radiation that is very energetic will

- a. be of a low frequency.
- b. have a long wavelength.
- c. contain mostly non-ionizing radiation.
- d. have a short wavelength.

ANSWER: d