**General Chemistry 2nd Quarter Bonus Quiz Answer Sheet**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_

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**General Chemistry Bonus Quiz, Part 1**

**Fall Semester – 2021-22**

1. How many electrons does oxygen-16 have?
2. 8
3. 16.999
4. 16
5. 24
6. How many neutrons are present in plutonium-245?
7. 94
8. 150
9. 151
10. 244
11. What is an isotope?
12. It is one of the forms of an element, differing from the others by the number of neutrons.
13. It is one of the forms of an element, differing from the others by atomic mass.
14. It is one of the forms of an element, differing from the others by the number of protons.
15. More than one of the above is correct.
16. What is a line spectrum?
17. The spectrum of sunlight.
18. A spectrum that consists only of certain energies of light.
19. A pattern of light given off by a Bunsen burner.
20. A set of orbitals that are given off by an element.
21. What is an orbital?
22. It’s another word for an electron
23. It’s where the electrons exist in the plum pudding model of the atom.
24. It’s where neutrons can be found in the atom.
25. It’s where electrons can be found in the atom.
26. What do we mean when we say that an electron is in an “excited state”?
27. It is in a low energy orbital.
28. It is in a high energy orbital.
29. It is jumping between orbitals.
30. It is giving off light.
31. What is spectroscopy?
32. It’s a way of heating elements.
33. It’s how you can tell if an atom has electrons.
34. It’s a way of identifying an unknown element from its protons.
35. It’s a way of identifying an unknown element from the light it emits.
36. Which of the following is characteristic of the Bohr model of the atom?
37. Orbitals near the nucleus have lower energy than those farther away.
38. Electrons can be found in circular orbits around the nucleus.
39. Light is give off when an electron falls from an excited state orbital to a ground state orbital.
40. All of the above.
41. Which of the following is characteristic of the quantum model of the atom?
42. Electrons are treated as waves.
43. Electrons can be found in circular orbits.
44. Orbitals can hold up to six electrons at a time.
45. None of the above is true of the quantum model of the atom.
46. What element is represented by the electron configuration 1s2 2s2 2p6 3s2 3p6 4s2 3d10 4p6 5s2 4d1?
47. Scandium (Sc)
48. Yttrium (Y)
49. Lanthanum (La)
50. This doesn’t represent any element because it is not a valid electron configuration.
51. Which of the following is the best definition of the “scientific method”?
52. It is a method that’s used when graphing scientific data.
53. It’s a systematic stepwise method for approaching scientific problems.
54. It’s a systematic method for determining the independent variable in an experiment.
55. It’s an approach to doing science that involves a “guess and check” way of solving problems.
56. What is a hypothesis?
57. It’s a statement in which a prediction is made about what will happen when the independent variable in an experiment is changed.
58. It’s a statement in which a prediction is made about what will happen when the dependent variable in an experiment is changed.
59. It’s a statement that explains the purpose of an experiment.
60. It’s a summary of the data collected in an experiment.
61. Which of the following pieces of lab equipment can be used to accurately measure the volume of a liquid?
62. Graduated cylinder
63. Beaker
64. Erlenmeyer flask
65. Balance
66. What piece of lab equipment should *always* be worn by students?
67. Beaker
68. Safety hat
69. Goggles
70. Rubber gloves
71. Which of the following is NOT an SI base unit?
72. Meter
73. Second
74. Yard
75. All of the above are SI base units.
76. What does the prefix “milli-“ mean?
77. One thousandth (0.001)
78. One millionth (0.000001)
79. One thousand (1,000)
80. One million (1,000,000)
81. What is the density of a ball that has a volume of 95 mL and a mass of 34 grams?
82. 0.036 g/mL
83. 0.36 g/mL
84. 0.28 g/mL
85. 2.8 g/mL
86. Which of the following is a good definition for accuracy?
87. It’s a measure of how often a measurement can be repeated.
88. It’s a measure of how close a measurement is to the actual value of the thing being measured.
89. It’s a measure of the precision of the measurement that’s being taken.
90. It indicates how many significant figures should be used when recording a measurement.
91. Which of these numbers has three significant figures?
92. 0.01
93. 0.010
94. 0.0010
95. 0.00100
96. Which of the following is not a characteristic of a good graph?
97. The data is graphed using a best fit line.
98. The independent variable is shown on the x-axis.
99. The best fit line does not pass through the origin.
100. Both axes are labeled
101. Which of these is a homogeneous mixture?
102. My Uncle Merle
103. Kool Aid
104. Ice-cold, refreshing Faygo brand diet cola
105. A mixture of rocks and water.
106. Which of these results in a chemical change?
107. Putting a hot dog in a blender
108. Putting a hot dog in a refrigerator
109. Putting a hot dog in a blast furnace
110. Soaking a hot dog in salt water until it shrivels up.
111. Which of these is an extensive property of my nephew’s hamster?
112. It does not rust when put into salt water.
113. It has a mass of 205 grams.
114. It is flammable (though this is *not* something we know from experience!)
115. All of the above are extensive properties of the hamster.
116. John Dalton had an atomic theory with five major points. Which of these is not a characteristic of his model of the atom?
117. Atoms are spherical
118. Atoms obey the law of conservation of energy
119. Atoms are indestructible
120. Atoms are very small
121. Which of these is not true of the plum pudding model of the atom?
122. The positive charge in the atom has negatively-charged electrons embedded in it.
123. Electrons can be easily pulled from the atom, while the positively-charged portion of the atoms cannot.
124. There is a positively-charged nucleus in the middle of the atom.
125. Electrons have negative charge, as shown by Thomson’s cathode ray experiment.

**General Chemistry 2nd Quarter Bonus Quiz**

1. Which of these phenomena convinced Rutherford that the positive charge in an atom is concentrated in the nucleus?
2. His cathode ray experiment showed that anode rays move toward the negative pole of a magnet.
3. His gold foil experiment showed that the positively-charged radioactive particles he fired at a target were deflected by positively-charged nuclei.
4. All of the positively-charged particles he shot at his gold foil target went right through the foil without being deflected at all.
5. When positively-charged particles were fired at a gold foil target, a beam of electrons was formed.
6. Which of the following is true of the halogens?
7. They are relatively unreactive.
8. They tend to form ions with a +1 charge.
9. They are diatomic.
10. They are metals.
11. What family of the periodic table contains elements that would be best suited to use as fuel in nuclear power plants?
12. Lanthanides
13. Actinides
14. Transition metals
15. Main block elements
16. Which of the following best describes electronegativity?
17. It is a measurement of the size of the atoms of an element.
18. It is a measurement of how much atoms expand when an electron is added to them.
19. It is a measurement of how much atoms tend to pull electrons away from other atoms they have bonded to.
20. It is a way of measuring the positive charge in the nucleus of an atom
21. Which of the following elements has the highest atomic radius out of all these choices?
22. Helium
23. Iodine
24. Lithium
25. Rubidium
26. Which of the following elements has the smallest ionization energy?
27. Fluorine
28. Lithium
29. Cesium
30. Iodine
31. Which of the following elements has six valence electrons?
32. Carbon
33. Oxygen
34. Gallium
35. Bromine
36. If a neutral atom gains an electron, which of the following is formed?
37. Proton
38. Electron
39. Cation
40. Anion
41. Which of the following is a general property of ionic compounds?
42. They conduct electricity as solids.
43. They conduct electricity when melted.
44. They have low melting and boiling points.
45. They are softer than the elements that make them up.
46. Why do ionic compounds generally have high melting and boiling points?
47. Cations are very hard
48. Anions are very hard
49. The attraction between anions and cations is strong
50. There is a lot of energy in the space around cation-cation interactions.
51. Which of these is a good definition of a “period” in the periodic table?
52. A collection of elements with similar properties.
53. A collection of elements with similar electron configurations.
54. It is another word for “group”.
55. A collection of elements in a row of the periodic table.
56. Which of the following is a demonstration of the octet rule?
57. Lithium gaining an electron to form a +1 ion.
58. Lithium gaining an electron to form a -1 ion.
59. Helium losing an electron to form a +1
60. Chlorine gaining an electron to form a -1 ion.
61. How does the shielding effect cause the ionization energy of elements to decrease as you move from top to bottom down a group in the periodic table?
62. Inner electrons are bigger than the outer electrons, making it harder to remove an electron from an atom.
63. Outer electrons are bigger than inner electrons, making it harder to remove an electron from an atom.
64. Inner electrons have a higher charge than outer electrons, making it easier for an atom to lose electrons.
65. The combined charge of the inner electrons push outer electrons away, making it easier to pull them away from the atom.
66. Which of the following is a reasonable explanation for why oxygen is less reactive than fluorine?
67. It has to lose two electrons to get the same number of valence electrons as neon.
68. It has to gain two electrons to get the same number of valence electrons as neon.
69. It has to lose six electrons to get the same number of valence electrons as helium.
70. It has to gain six electrons to get the same number of valence electrons as helium.
71. Which of the following is most likely not an ionic compound?
72. beryllium acetate
73. copper(II) hydroxide
74. carbon
75. potassium bromide
76. Why do salts conduct electricity when melted or dissolved in water?
77. Electricity is formed when water is melted.
78. Electricity can be caused by the movement of ions.
79. Stationary ions have electronegativity deficits.
80. The ions attach to water molecules and form ionic liquids.
81. Why are ionic compounds hard?
82. Metals are hard, so metal ions are also hard.
83. Ionic crystals are extremely stable and the ions are locked in place.
84. Covalent bonding causes the ions to repel outside forces.
85. Metallic bonding causes the ions to have a strong attraction toward each other.
86. What is the charge of an iron(II) ion?
87. -2
88. +2
89. +3
90. It varies on what compound it’s in.
91. What is the name of Sr3N2?
92. strontium nitride
93. strontium (II) nitride
94. strontium nitrate
95. strontium (II) nitrate
96. What is spectroscopy?
97. It’s a method for identifying ionic compounds using their mass.
98. It’s a method for identifying elements using their line spectra.
99. It’s a method for identifying elements using their continuous spectra.
100. It’s a method for determining whether something is a metal, nonmetal, or metalloid.
101. Which of these elements is most electronegative?
102. He
103. H
104. F
105. Fr
106. Which of the following can easily conduct electricity?
107. Metals
108. Iron
109. Metalloids, but only if they’re heated or subjected to high voltage.
110. All of the above.
111. How are ionic compounds formed?
112. Electronegative elements give electrons to elements that are less electronegative.
113. Electronegative elements receive electrons from elements that are less electronegative.
114. Two cations stick together to form a compound.
115. Two anions stick together to form a compound.
116. Which of these is **not** a property of the alkali metals?
117. They are reactive
118. They want to lose electrons to be like the nearest noble gas.
119. They have the smallest atomic radii of the elements in their periods.
120. They have low melting and boiling points.
121. Which of these statements is true?
122. Mr. Guch is the smartest teacher I have.
123. Mr. Guch is kind and gentle; animals and babies love him.
124. Mr. Guch will probably be sainted one day for being so awesome.
125. All of the above.