**Honors Chemistry Double Quiz – Remote Students**

**Fall Semester – 2021-22**

Instructions:

You have exactly 50 minutes to do this quiz and return it by email. Since it will be posted at 2:05 pm, it will need to be in my email inbox by 2:55 pm. Some rules about this quiz:

* If I don’t receive your email by 2:55 pm, you will not receive credit for this quiz.
* You may submit your answers either by writing them all in a Word document that you attach to your email or by writing them in the body of the email. Please make sure your answers are legible if you write them by hand.
* I expect that you will take this “closed book.” Obviously I can’t enforce this, but I trust you all to do the right thing.

Good luck!

1. How many electrons does oxygen-16 have?
2. 8
3. 16.999
4. 16
5. 24
6. What is the atomic mass of the isotope of ruthenium with 58 neutrons?
7. 44 amu
8. 58 amu
9. 102 amu
10. 101.07 amu
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 spectroscopy?
17. It’s a way of heating elements.
18. It’s how you can tell if an atom has electrons.
19. It’s a way of identifying an unknown element from its protons.
20. It’s a way of identifying an unknown element from the light it emits.
21. Which of the following is characteristic of the Bohr model of the atom?
22. Orbitals near the nucleus have lower energy than those farther away.
23. Electrons can be found in circular orbits around the nucleus.
24. The energies of electrons can be determined by the variable n.
25. All of the above.
26. Which of the following is characteristic of the quantum model of the atom?
27. Electrons are treated as waves.
28. Electrons can be found in circular orbits.
29. Orbitals can hold up to six electrons at a time.
30. None of the above is true of the quantum model of the atom.
31. What element is represented by the electron configuration 1s2 2s2 2p6 3s2 3p6 4s2 3d10 4p6 5s2 4d1?
32. Scandium (Sc)
33. Yttrium (Y)
34. Lanthanum (La)
35. This doesn’t represent any element because it is not a valid electron configuration.
36. What is Hund’s rule?
37. No two electrons can exist in the same atom.
38. Electrons prefer to stay unpaired in orbitals when possible.
39. Electron configurations reflect a “building up” of terms.
40. No two electrons can have the same four quantum numbers.
41. If I have 8.7 kilograms, how many centigrams is this?
42. 0.087 cg
43. 0.87 cg
44. 87 cg
45. 870 cg
46. Which of the following is a good definition for accuracy?
47. It’s a measure of how often a measurement can be repeated.
48. It’s a measure of how close a measurement is to the actual value of the thing being measured.
49. It’s a measure of the precision of the measurement that’s being taken.
50. It indicates how many significant figures should be used when recording a measurement.
51. Why do we use significant figures in chemistry?
52. To indicate the accuracy of the measurement being taken.
53. To indicate the accuracy we hope to get in an experiment.
54. To indicate the precision of the measurement being taken.
55. None of these are a good explanation for why we use significant figures.
56. Which of the following is not a characteristic of a good graph?
57. The data is graphed using a best fit line.
58. The independent variable is shown on the x-axis.
59. The best fit line should never pass through the origin.
60. Both axes are labeled
61. When I heated a solid material, it turned into a liquid. This indicates a \_\_\_\_\_\_\_\_\_ change took place.
62. Intensive
63. Extensive
64. Chemical
65. Physical
66. Which of these is not true of the plum pudding model of the atom?
67. The positive charge in the atom has negatively-charged electrons embedded in it.
68. Electrons can be easily pulled from the atom, while the positively-charged portion of the atoms cannot.
69. There is a positively-charged nucleus in the middle of the atom.
70. Electrons have negative charge, as shown by Thomson’s cathode ray experiment.
71. Which of these phenomena convinced Rutherford that the positive charge in an atom is concentrated in the nucleus?
72. His cathode ray experiment showed that anode rays move toward the negative pole of a magnet.
73. His gold foil experiment showed that the positively-charged radioactive particles he fired at a target were deflected by positively-charged nuclei.
74. All of the positively-charged particles he shot at his gold foil target went right through the foil without being deflected at all.
75. When positively-charged particles were fired at a gold foil target, a beam of electrons was formed.
76. Which of the following best describes electronegativity?
77. It is a measurement of the size of the atoms of an element.
78. It is a measurement of how much atoms expand when an electron is added to them.
79. It is a measurement of how much atoms tend to pull electrons away from other atoms they have bonded to.
80. It is a way of measuring the positive charge in the nucleus of an atom
81. Which of the following elements has the highest atomic radius?
82. Helium
83. Iodine
84. Lithium
85. Rubidium
86. Which of the following elements has the smallest ionization energy?
87. Fluorine
88. Lithium
89. Cesium
90. Iodine
91. Another term for d-block elements is:
92. Lanthanides
93. Actinides
94. Transition metals
95. All of these are technically correct
96. Why do metals and nonmetals generally react with one another to form ionic compounds?
97. Metals have low electronegativity and nonmetals have higher electronegativity, so it’s easy for metals to transfer electrons to nonmetals to form an anion and cation.
98. Metals have high electronegativity and nonmetals have lower electronegativity, so it’s easy for nonmetals to transfer electrons to metals to form a cation and anion.
99. Metals are noble gases, as are nonmetals.
100. The periodic trend for electronegativity down a group is decreasing electronegativity.
101. Which of the following is a general property of ionic compounds?
102. They conduct electricity as solids.
103. They conduct electricity when melted.
104. They have low melting and boiling points.
105. They are softer than the elements that make them up.
106. Generally speaking, why doesn’t carbon form ionic compounds?
107. Its low electronegativity means that it doesn’t tend to form ions.
108. Its high electronegativity means that it doesn’t tend to form ions.
109. It is a metalloid and metalloids generally don’t form ionic compounds with metals or nonmetals.
110. It is only moderately electronegative, making it difficult for it to either gain or lose electrons.
111. 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?
112. Inner electrons are bigger than the outer electrons, making it harder to remove an electron from an atom.
113. Outer electrons are bigger than inner electrons, making it harder to remove an electron from an atom.
114. Inner electrons have a higher charge than outer electrons, making it easier for an atom to lose electrons.
115. The combined charge of the inner electrons push outer electrons away, making it easier to pull them away from the atom.
116. Why do salts conduct electricity when melted or dissolved in water?
117. Electricity is formed when water is melted.
118. Electricity can be caused by the movement of ions.
119. Stationary ions have electronegativity deficits.
120. The ions attach to water molecules and form ionic liquids.
121. What is the name of Sr3N2?
122. strontium nitride
123. strontium (II) nitride
124. strontium nitrate
125. strontium (II) nitrate