AP CHEMISTRY CHAPTER 7 PRACTICE TEST

1. What is the wavelength of a photon having a frequency of 2.47 x 1015 Hz?

(1 m = 1 x 109 nm)

1. 122 nm
2. 1.63 x 10-9 nm
3. 0.490 nm
4. 8.00 x 10-32 nm
5. 8.22 x 10-3 nm
6. What is the energy of a photon of electromagnetic radiation with a wavelength of 766.9 nm? (h = 6.63 x 10-34 J . s)
7. 3.91 x 1014 J
8. 2.59 x 10-28 J
9. 5.00 x 10-40 J
10. 1.69 x 10-39 J
11. 2.59 x 10-19 J
12. From the Bohr model of the hydrogen atom, we can conclude that the energy required to excite an electron from n = 2 to n = 3 is \_\_\_\_\_\_\_\_ the energy required to excite an electron from n = 3 to n = 4.
13. less than
14. greater than
15. equal to
16. either equal to or less than
17. either equal to or greater than
18. Which of the following subshells does NOT exist?
19. 2s
20. 3p
21. 4d
22. 3f
23. 6g
24. Which of the following statements is INCORRECT?
25. The n = 2 shell has five d orbitals
26. The n = 3 shell has three p orbitals
27. An s orbital has a spherical shape
28. Every p subshell has three orbitals
29. The n = 4 shell has seven f orbitals
30. Which of the following electron configurations is impossible according to the Pauli Exclusion Principle?
31. 1s22s22p3
32. 1s22s22p5
33. 1s22s22p1
34. 1s22s3
35. 1s22s22p63s1
36. Which of the following electron configurations represents an EXCITED state of the indicated atom?
37. He: 1s2
38. Ne: 1s22s22p6
39. Na: 1s22s22p63s23p24s1
40. P: 1s22s22p63s23p24s1
41. N: 1s22s22p3
42. All of the following ground-state electron configurations are correct EXCEPT
43. K: [Ar]4s1
44. Co: [Ar]4s23d7
45. Cu: [Ar]4s13d10
46. In: [Kr]5s24d105p1
47. I: [Kr]5s24d105p3
48. The change in energy for which of the following processes represents the first ionization energy of chlorine?
49. Cl(g) → Cl+(g) + e
50. Cl-(g) → Cl+(g) + 2e
51. 2Cl-(g) → Cl2(g) + 2e
52. Cl(g) → Cl2+(g) + 2e
53. Cl(g) + e → Cl-(g)
54. An atom of which of the following elements has the largest ionization energy?
55. Br
56. Se
57. As
58. Ge
59. K
60. Which of the following ground state electron configurations corresponds to an atom having the largest ionization energy?
61. [Ne]3s23p2
62. [Ne]3s23p3
63. [Ar]4s23d104p3
64. [Kr]5s24d105p3
65. [Xe]6s24f145d106s26p3
66. An atom of which of the following elements has the most negative electron affinity?
67. Na
68. Cl
69. Br
70. S
71. P
72. In the Born-Haber cycle for NaBr(s), which of the following processes corresponds to the electron affinity of Br?
73. Br(g) → Br+(g) + e
74. NaBr(s) → Na+(g) + Br-(g)
75. Br2(g) → 2Br(g)
76. Br-(g) → Br(g) + e
77. Br(g) + e → Br-(g)
78. What is the electron configuration of Mn2+?
79. [Ar]4s23d5
80. [Ar]4s23d3
81. [Ar]4s13d4
82. [Ar]3d5
83. [Ar]3d54s1
84. Which of the following species would you expect to have the largest radius?
85. K+
86. S2-
87. Se2-
88. P
89. Al3+

ANSWERS:

1. A

2. E

3. B

4.D

5. A

6.D

7.D

8.E

9.A

10.A

11.B

12.B

13.E

14.D

15.C