

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

Key

Chemistry R Unit 4 Practice Test

- 4) 1) In the modern Periodic Table, the elements are arranged according to  
1) oxidation number 3) atomic mass  
2) mass number 4) atomic number
- 3) 2) The chemical properties of elements are periodic functions of their  
1) oxidation states 3) atomic numbers  
2) mass numbers 4) ionic charges
- 2) 3) Who was credited with creating the first Periodic Table that organized the elements according to atomic mass?  
1) John Dalton 3) Henry Moseley → organized by atomic #  
2) Dmitri Mendeleev 4) Ernest Rutherford
- 2) 4) Which of the following is an alkaline earth metal? Group 2 Elements  
1) Pb 2) Mg 3) Li 4) Zn
- 1) 5) Which of the following is the electron configuration of a transition element? Groups 3-12  
1) 2-8-9-2 <sup>(Sc)</sup> 2) 2-8-2 Mg 3) 2-2 Be 4) 2-8-8-2 Ca
- 3) 6) The reactivity of the metals in Groups 1 and 2 generally increases with  
1) decreased mass 3) increased atomic radius  
2) increased ionization energy 4) decreased nuclear charge
- 2) 7) Which represents the correct electron configuration of the outermost principal energy level of a Group 18 element in the ground state? valence shell  
1)  $s^2p^2$  2)  $s^2p^6$  3)  $s^2p^8$  4)  $s^2p^4$
- 4) 8) Which element is in Group 2 and Period 7 of the Periodic Table? Ra  
1) radon 3) manganese  
2) magnesium 4) radium
- 3) 9) On the Periodic Table, an element classified as a semimetal (metalloid) can be found in B, Si, As, Te, Ge, Sb  
1) Period 2, Group 14 C 3) Period 4, Group 15 As, Ge, Sb  
2) Period 3, Group 16 S 4) Period 6, Group 15
- 1) 10) Alkali metals, alkaline earth metals, and halogens are found respectively in Groups  
1) 1, 2, and 17 3) 1, 2, and 18  
2) 2, 13, and 17 4) 1, 2, and 14
- 4) 11) Atoms of elements in a group on the Periodic Table have similar chemical properties. This similarity is most closely related to the atoms' same group / same # of valence e-  
1) number of principal energy levels 3) atomic masses  
2) atomic numbers 4) number of valence electrons
- 1) 12) Which two elements have the most similar chemical properties? same group  
1) sodium and potassium Na and K 3) nickel and phosphorus  
2) aluminum and barium 4) chlorine and sulfur

4 13) Which sequence of atomic numbers represents elements which have similar chemical properties?

~~1) 19, 23, 30, 36~~

~~3) 9, 16, 33, 50~~

~~2) 3, 12, 21, 40~~

4) 4, 20, 38, 88

1 14) Which group contains elements with the greatest variation in chemical properties?

1) Li, Be, B *across a period*

~~3) Li, Na, K~~

~~2) B, Al, Ga~~

~~4) Be, Mg, Ca~~

2 15) As the atoms of the metals of Group 1 in the ground state are considered in order from top to bottom, the number of occupied principal energy levels

1) remains the same

2) increases *4 valence e<sup>-</sup>*

3) decreases

1 16) Which group contains elements with a total of four electrons in the outermost principal energy level?

1) 14

2) 1

3) 18

4) 16

3 17) Which represents the correct electron configuration of the outermost principal energy level of a Group 14 element in the ground state?

1)  $s^2p^8$

2)  $s^2p^6$

*s<sup>2</sup>p<sup>2</sup>*

3)  $s^2p^2$

4)  $s^2p^4$

2 18) The elements of Period 2 have the same

1) atomic number

2) number of occupied principal energy levels

3) number of occupied sublevels

4) atomic mass

2 19) In which category of elements in the Periodic Table do *all* of the atoms have valence electrons in the second principal energy level?

1) the alkaline earth family

3) the alkali metals family

2) Period 2

4) Group 2

3 20) As the elements in the ground state in Period 3 are considered in order of increasing atomic number, the number of electrons in the 2p sublevel

*↳ all are filled w/ 2p<sup>6</sup>*

1) increases

2) decreases

3) remains the same

1 21) Compared to the atomic radius of a sodium atom, the atomic radius of a magnesium atom is smaller. The smaller radius is primarily a result of the magnesium atom having

*nuclear charge increases as you go across a period.*

1) a larger nuclear charge

3) a smaller nuclear charge

2) fewer principal energy levels

4) more principal energy levels

4 22) Compared to a neon atom, a helium atom has a

~~1) greater number of electrons~~

~~3) larger atomic number~~

~~2) smaller first ionization energy~~

4) smaller radius

3 23) Which atom has the *smallest* atomic radius?

1) Be

2) C

3) F *→ greatest nuclear charge.*

4) Li

2 24) Which sequence of elements is arranged in order of decreasing atomic radii?

~~1) Cl, Br, I *increases*~~

~~3) N, C, B *increases*~~

2) Al, Si, P

~~4) Li, Na, K *increases*~~

- 25) 4 As the elements of Group 16 are considered from top to bottom on the Periodic Table, the atomic radii
- 1) decrease and the ionization energies increase
  - 2) decrease and the ionization energies decrease
  - 3) increase and the ionization energies increase
  - 4) increase and the ionization energies decrease
- 26) 2 As the atoms of the elements from atomic number 3 to atomic number 9 are considered in sequence from left to right on the Periodic Table, the atomic radius of each successive atom is
- 1) smaller, and the nuclear charge is less
  - 2) smaller, and the nuclear charge is greater → increasing # of protons, pulls e<sup>-</sup> closer to the nucleus.
  - 3) larger, and the nuclear charge is less
  - 4) larger, and the nuclear charge is greater
- 27) 4 The element in Period 2 with the *largest* atomic radius is
- 1) a halogen
  - 2) a noble gas
  - 3) an alkaline earth metal
  - 4) an alkali metal → furthest to the left
- 28) 1 Which electron configuration represents the element with the *smallest* atomic radius?
- 1) 2-7
  - 2) 2-6
  - 3) 2-4
  - 4) 2-5 → furthest element to the right in Period 2
- 29) 3 As a sulfur atom gains electrons, its radius
- 1) decreases
  - 2) remains the same
  - 3) increases
- 30) 1 The radius of a calcium ion is *smaller* than the radius of a calcium atom because the calcium ion contains the same nuclear charge and
- 1) fewer electrons
  - 2) more electrons
  - 3) more protons
  - 4) fewer protons
- Ca<sup>2+</sup> - loses 2 e<sup>-</sup>
- 31) 4 Which element forms an ion that is *larger* than its atom?
- 1) Mg Mg<sup>2+</sup>
  - 2) Li Li<sup>+</sup>
  - 3) Ca Ca<sup>2+</sup>
  - 4) Cl Cl<sup>-</sup> → anion (gains e<sup>-</sup>)
- 32) 1 Which part of the Periodic Table contains elements with the *greatest* metallic properties?
- 1) lower left (Fr is the strongest metal)
  - 2) upper right
  - 3) upper left
  - 4) lower right
- 33) 3 At which location in the Periodic Table would the *most* active metallic element be found?
- 1) in Group 17 at the top
  - 2) in Group 1 at the top
  - 3) in Group 1 at the bottom Francium
  - 4) in Group 17 at the bottom
- 34) 1 Low ionization energies are *most* characteristic of atoms that are
- 1) metals
  - 2) nonmetals
  - 3) metalloids
  - 4) noble gases
- 35) 4 A STP, which substance is the *best* conductor of electricity?
- 1) oxygen NM
  - 2) helium noble gas.
  - 3) hydrogen NM
  - 4) mercury metal.

