

Name: _____ Block: ___ Date: _____

GC Chapters 3 and 5 Review

Match the following scientists to his accomplishment.	
___ 1. Avagadro	a. Atomic theory of matter
___ 2. Democratus	b. Discovery of the electron
___ 3. Dalton	c. Designed the first periodic table by atomic mass
___ 4. Millikan	d. Designed the current periodic table based on periodic law (increasing atomic #)
___ 5. Thompson	e. Charge of the electron
___ 6. Rutherford	f. Discovery of the mole, 6.022×10^{23} atoms
___ 7. Bohr	g. Discovery of the nucleus and that atom is mostly empty space
___ 8. Mendeleev	h. Matter is made of particles he called atomos
___ 9. Moseley	i. Discovered the energy levels

Complete the following definitions:

Average atomic mass:
Atomic number:
Ion:
Cation:
Anion:
Isotope:
Strong nuclear force:
Electronegativity:
Atomic radius:
Ionization Energy:

Illustrate the atomic models for the following scientists:

Dalton	Thompson	Rutherford	Bohr
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Using the Bohr model, illustrate the following atoms: (include, protons, neutrons, electrons and energy levels)

Calcium	Carbon	Argon
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Complete the following average atomic mass problems. Show all work.

Nitrogen-14 95%, Nitrogen-15 3%, Nitrogen-16 2%

Oxygen-16 99.76%, Oxygen-17 0.037%, Oxygen-18 0.204%

Complete the following half-life problems:

The half-life of the radioactive isotope phosphorus-32 is 14 days. How grams of a 600.0g sample will be left after 70 days?

The half-life of thorium-227 is 19 days How many days are required for a 250.0g sample to be reduced to 62.5g?

Complete the following table.

Element	Symbol	Atomic number	Mass Number	Number of protons	No. of electrons	No. of neutrons
Carbon			12		6	
	K	19				20
		5		5		6
Nitrogen-15						8
	$^{20}_{10}\text{Ne}$					
Beryllium-9		4				
Aluminum ion	Al^{3+}					
Oxygen ion	O^{2-}					

Write the nuclear equation for the following problems.

- the alpha decay of uranium-238
- the beta decay of lead-214

Answer the following multiple choice questions.

- The properties of elements reoccur periodically when the elements are arranged in order of increasing:
 - atomic mass
 - atomic number
 - atomic radius
 - electron affinity
- The original periodic table was created by:
 - Mendeleev
 - Mosely
 - Rutherford
 - Bohr
- Elements that have similar properties are aligned in vertical columns called:
 - periods
 - blocks
 - groups
 - rows
- Na and K have similar properties because they have the same:
 - atomic radii
 - ionization energy
 - number of valence electrons
 - electronegativity
- The widest block of atoms, which contains 14 elements, is the:
 - s-block
 - p-block
 - d-block
 - f-block
- Atomic radius increases as you move:
 - down a group
 - up a group
 - across a period, from left to right
 - on a diagonal from lower left to upper right

- _____ 7. The fluorine ion is larger than the fluorine atom because:
- the F ion has a stronger positive charge than the F atom
 - the F ion has more electron-electron repulsions than the F atom
 - the F ion has one fewer electron
 - the F ion now has an empty valence energy level
- _____ 8. The elements with the highest ionization energies are the:
- noble gases
 - halogens
 - alkali metals
 - transition metals
- _____ 9. Elements from the halogen group make the strongest bonds with elements from the _____ group.
- alkali metals
 - alkaline earth metals
 - noble gases
 - transition metals
- _____ 10. The statement that atoms tend to gain, lose or share electrons in order to acquire a full set of valence electrons is called the:
- octet rule
 - rule of octaves
 - triad rule
 - orbital principle
- _____ 11. According to their placement on the periodic table, which of the following pairs of elements would have the most similar atomic structure?
- sodium and scandium
 - sodium and potassium
 - sodium and barium
 - sodium and aluminum
- _____ 12. Oxygen and sulfur are in the same group (VI A) in the periodic table. This means that, in general, oxygen and sulfur:
- will react only with each other
 - undergo similar reactions
 - can only react with elements in group VI A
 - combine only with elements in period IV and higher
- _____ 13. All elements in the same period have the same number of:
- neutrons
 - energy levels
 - protons
 - electrons in the outer energy level
- _____ 14. Using the periodic table, how many valence electrons are found in the elements of group V A (5A)?
- 1
 - 5
 - 7
 - 3

- ____ 15. Which of the following describes the tendency for atomic radii as displayed by the periodic table?
- Atomic radii increases left to right across a period.
 - Atomic radii increases as you go down a group.
 - Atomic radii decreases as you go down a group.
 - Atomic radii decreases as you go diagonally, from top right to bottom left.
- ____ 16. Which of the following has an ionic radius that is smaller than an oxygen ion?
- boron
 - francium
 - helium
 - sulfur
- ____ 17. Which of these elements is the most chemically active?
- F
 - Cl
 - Br
 - I
- ____ 18. Which of the following elements has the highest electronegativity?
- Fr
 - Na
 - F
 - At
- ____ 19. Which energy level is Copper filling?
- s*-block
 - d*-block
 - p*-block
 - f*-block
- ____ 20. What is the relationship between ionization energy and electronegativity?
- inc/inc
 - inc/dec
 - dec/inc
 - no relationship
- ____ 21. Which of the following particles has a negative charge and a mass of 0 amu?
- electron
 - neutron
 - proton
 - nucleus
- ____ 22. Which of the following describes the nucleus?
- neutral, containing electrons and protons
 - positive, containing protons and neutrons
 - negative, containing electrons and neutrons
 - neutral, containing protons and neutrons
- ____ 23. Which of the following is both a solid and a non-metal?
- Nickel
 - Neon
 - Carbon
 - Mercury
- ____ 24. Which of the following is a lanthanoid?
- Calcium
 - Europium
 - Cesium
 - Argon
- ____ 25. Which of the following is a good conductor of electricity and heat?
- Metals
 - Metalloids
 - Non-metals
 - Gases
- ____ 26. Which of the following is liquid at room temperature?
- Silver
 - Nitrogen
 - Bromine
 - Argon