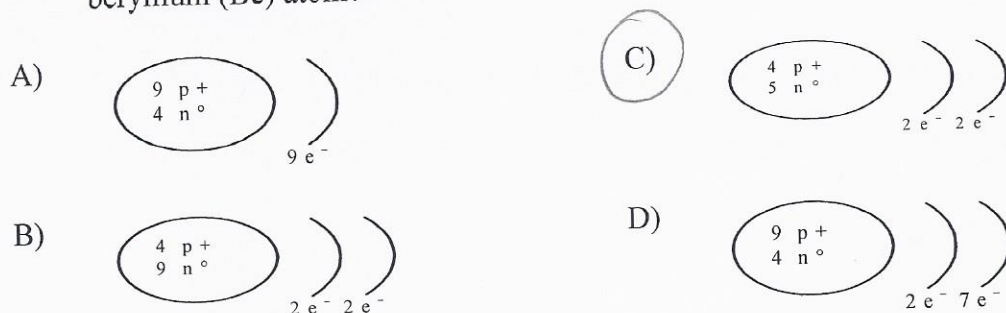


Test review- Trends, Isotope, Radiation....

1. Which of the following diagrams correctly represents the simplified atomic model of the beryllium (Be) atom?



2. Choose the correct answer to complete the following sentence. In all neutral atoms there are always...

- A) as many protons as electrons. C) as many electrons as neutrons.
 B) as many protons as neutrons. D) more neutrons than protons.

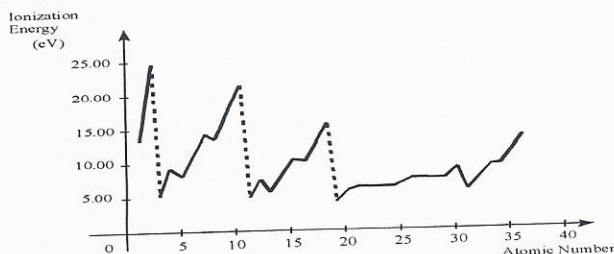
3. Give the definition and trend for the following:

	Definition	Trend
Atomic radius	Size of the element	← ↓
Reactivity	Reaction of elements	metal ← ↓ ↑ →
Ionization	Energy needed to remove an e ⁻	↑ →
Electronegativity	Energy required to attract e ⁻	↑ →

4. Which of the following statement is true for metal reactivity?

- A) As you go down a group or family the reactivity rate decreases.
 B) As you go across a period from group 1 to group 3, the reactivity rate increases.
 C) As you go across a period from group 1 to group 3, there is no change to the reactivity rate.
 D) As you go down a family or group the reactivity rate increases.

5. The following graph shows the ionization energies of certain elements as a function of their atomic numbers.



According to this graph, which of the following statements is TRUE?

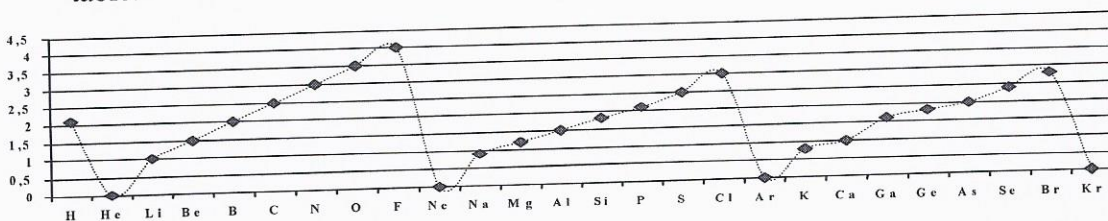
- A) Ionization rates increase as you go across a period because the number of valence electrons increases.
- B) Ionization rates increase as you go across a period because the number of valence electrons decreases.
- C) Ionization rates increase as you go across a period because the number of orbits increases.
- D) Ionization rates increase as you go across a period because the number of orbits decreases.

6. Which of the following statements are true for the atomic radius within the same period?

- I) Moving from left to right across a given period, there is an increase in the number of electrons, protons and neutrons, and thus the atomic radius increases.
- II) The atomic radius decreases with the increasing atomic number across a given period.
- III) The atomic radius is independent from the type of atom within a given period.
- IV) Moving from left to right across a given period, there is an increase in the number of protons and electrons. Therefore the electric forces between nucleus and shell increases, thus reducing the atomic size.

- A) I and III B) I, II and IV C) II and III D) II and IV

7. The graph below shows the electronegativity index of some elements of the periodic table.



Which of the following statement is true?

- A) The electronegativity index steadily increases within the same family.
- B) The electronegativity index steadily increases, then drops to 0 within the same period.
- C) The electronegativity index remains constant within the same family period as one goes from left to right on the periodic table.
- D) The electronegativity index steadily decreases within the same period.

8. The properties of the elements in the periodic table vary from one element to another as you go down a group. Four of these variations are :

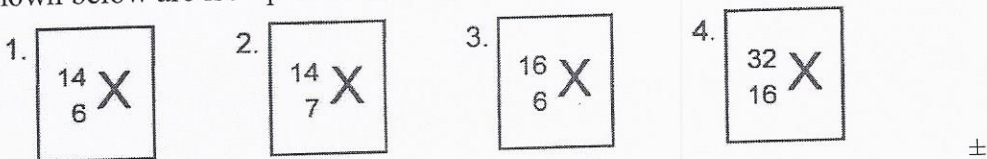
- 1. Atomic radius 3. Electronegativity
- 2. Chemical activity 4. Ionization

Which of these variations will increase as you go down group 1?

- A) 1 and 2 B) 1 and 3 C) 2 and 4 D) 3 and 4

9. An oxygen atom has 8 protons, 8 neutrons and 8 electrons. Which of the following describes an isotope of an oxygen atom?
- A) It has 8 protons, 8 neutrons and 10 electrons.
 B) It has 10 protons, 8 neutrons and 8 electrons.
 C) It has 8 protons, 10 neutrons and 8 electrons.
 D) It has 10 protons, 10 neutrons and 8 electrons

10. Shown below are isotopes of unknown elements.

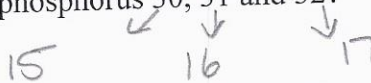


Which diagrams, illustrated above, represent isotopes of the same element?

A) 1 and 2 B) 1 and 3 C) 2 and 4 D) 3 and 4

11. In parts of the periodic table, as the atomic number increases, the atomic mass decreases. Argon (Ar) and potassium (K) are examples of this. Which of the following statements helps to explain this irregularity?
- A) The radius of an atom increases with the period number.
 B) The atomic mass of alkali metals is smaller than that of inert gases.
 C) The number of isotopes differs from one element to another.
 D) The atomic number corresponds to the number of protons of the atom.

12. What are the neutron possibilities for phosphorus 30, 31 and 32?



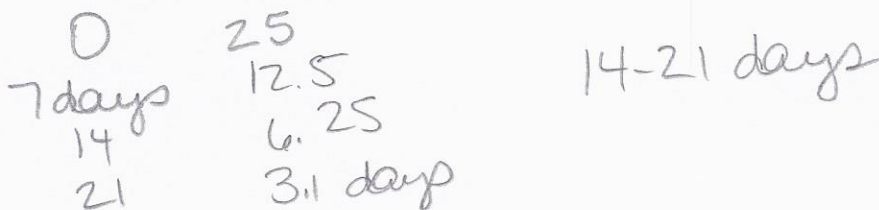
13. Bromine has three possible isotopes: Br 78, Br 79 and Br 80. Determine which form of bromine is most abundant.

Br 80

14. Fill in the table for the three types of radioactive rays.

Type	Charge	Stopped by?
Alpha	+	paper or hand
Beta	-	Al or wood
Gamma	none	lead or concrete

15. Calculate the time it would take to have less than 4.0 g of tellurium if its half-life is 7 days and you begin with 25.0 g.



16. Carbon-14 half-life is 5 770 years. You want to know the approximate age of a piece of wood that contains only 20% of carbon-14. What is the approximate age of the piece discovered?

0	100%
5770	50
11540	25
17310	12.5

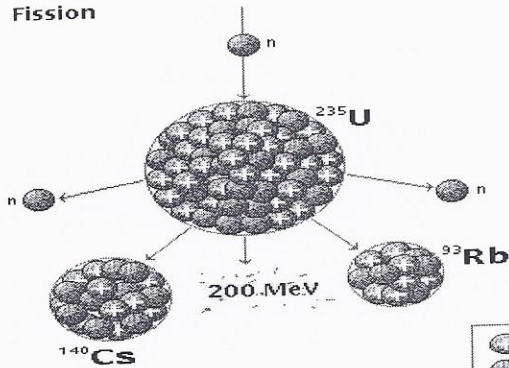
bt
11540 - 17310 years

17. Explain if it is best to use an element with a very quick half-life or a very long half-life when putting the radioactive substance in the body.

Very quick, it gets eliminated out of the body quickly.

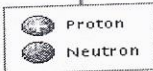
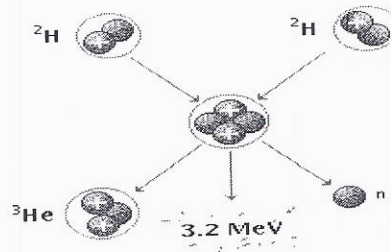
18. Explain each picture

Fission



Microsoft Illustration

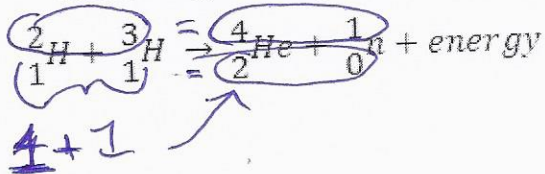
Fusion



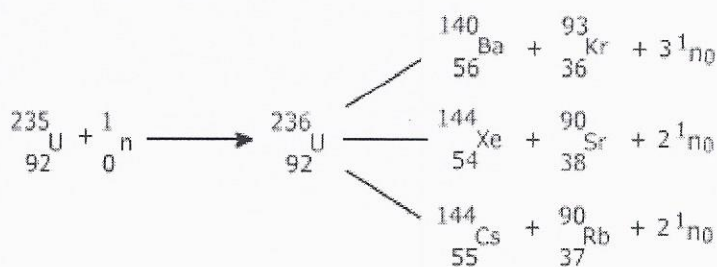
- heavy atom becomes 2 lighter atoms
- free neutrons continue reaction

- 2 lighter atoms becoming heavier atom.
- does not exist yet.

19. Looking at the equation below, explain why helium must be the element produced.



20. Using the picture below, explain why barium is paired with krypton and not strontium or rubidium. Explain why some equations have three free neutrons and others have 2 free neutrons.



- atomic # must add up to 92. So $56 + 36(\text{Kr}) = 92$ atomic #.

- to ensure the equation is balanced & you have mass # of 236.

21. Make a Lewis diagram for each and give the molecular formula.

	Lewis diagram	Molecular formula
Aluminum fluoride		AlF ₃
Chlorine		Cl ₂
Phosphorus tribromide		PBr ₃
Calcium chloride		CaCl ₂

22. Give the molecular formula for the following.

Beryllium sulfide	BeS	Hydrogen fluoride	HF
Sodium oxide	Na ₂ O	Dihydrogen sulfide	H ₂ S
Diphosphorus trisulfide	P ₂ S ₃	Iodine	I ₂
Carbon tetrachloride	CCl ₄	Aluminum sulfide	Al ₂ S ₃

23. Name the following molecules.

Na ₃ P	Sodium phosphide	SCl ₂	Sulfur dichloride
NaCl	Sodium chloride	PF ₃	Phosphorus trifluoride
NH ₃	Nitrogen trihydride	C ₂ S ₄	Dicarbon tetrasulfide
O ₂	Oxygen	BeCl ₂	Beryllium chloride

24. Write all the possible molecular formulas and names of the molecules formed when the following metals and radicals bond.

K	Mg	Al	SO ₄ ²⁻	PO ₄ ³⁻
Formula			Name	
K			SO ₄ ²⁻	
K ₂ SO ₄ = K ₂ SO ₄			potassium sulfate	
K			PO ₄ ³⁻	
K ₃ PO ₄ = K ₃ PO ₄			" phosphate	
Mg			SO ₄ ²⁻	
MgSO ₄ = MgSO ₄			magnesium sulfate	
Mg			PO ₄ ³⁻	
Mg ₃ (PO ₄) ₂ = Mg ₃ (PO ₄) ₂			" phosphate	
Al			SO ₄ ²⁻	
Al ₂ (SO ₄) ₃ = Al ₂ (SO ₄) ₃			aluminum sulfate	
Al			PO ₄ ³⁻	
AlPO ₄ = AlPO ₄			" phosphate	

25. Some of the following molecules do not have the proper ions showing. Determine which are wrong and correct them.

Molecule	Correction
Li(OH) ₂	LiOH = LiOH
Li ₂ NO ₃	LiNO ₃ = LiNO ₃
CaCrO ₄	CaCrO ₄ = CaCrO ₄ ✓
B ₃ PO ₄	B ₃ PO ₄ = B ₃ PO ₄

26. The formula aluminum phosphate is AlPO₄. In this formula, what is the charge of the radical phosphate, PO₄?

A) 1-

B) 2-

C) 3-

D) 6-

27. Given that the radical AsO₄ has charge of 3⁻, determine with the help of the periodic table, the formula of the compound resulting from its combination with magnesium.

A) MgAsO₄

B) Mg₃(AsO₄)₂

C) Mg₃AsO₄

D) Mg(AsO₄)₃