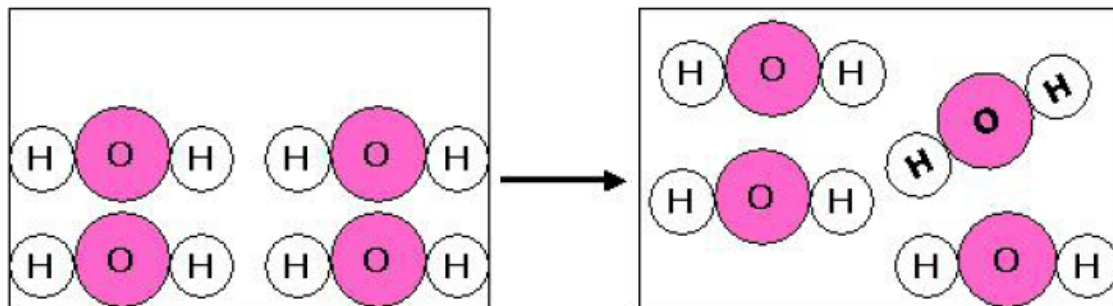
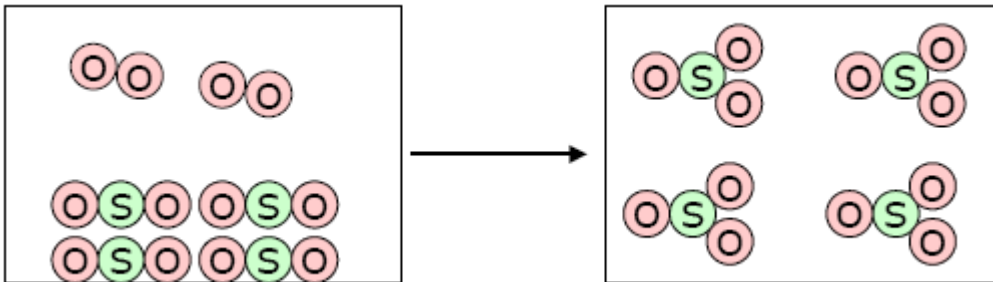


EXAM: "The Atomic Theory & The Periodic Table"

- 1 With the pictures below, do the following:
- classify the matter (0.5 POINTS)
 - classify the change (0.5 POINTS)
 - write the equations (0.5 POINTS)

1.5 POINTS
ESTIMATED TIME: 5 min



(this substance has not a fixed shape)

(You can use this space to write your answer)

Do the following:

2

- Write the missing information about atoms / ions and indicate which ones are isotopes (2 POINTS: 1 POINT for the NUMBERS, 0.5 POINTS for the ORBITAL DIAGRAMS and 0.5 POINTS for LEWIS)
- If the natural abundance of the isotopes are 25% for the first and 75% for the second (placed below the first in the table), calculate the average atomic mass (0.5 POINTS)

NOTE: The symbols are not real
ESTIMATED TIME: 10 min

Atom or ion	A	Z	# of			Electron Configuration							
			p ⁺	n ⁰	e ⁻	Orbital diagram					Lewis		
${}_{15}^{31}\text{A}$						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
${}_{17}^{35}\text{B}$						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
${}_{8}^{\square}\text{C}^{2-}$				10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
${}_{19}^{39}\text{D}^{\square}$					18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
${}_{17}^{37}\text{E}$						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

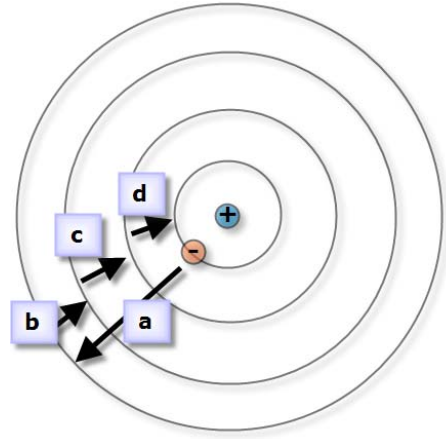
(You can use this space to write your answer)

3 Look at the graphic below (this represents a group of hydrogen atoms). Knowing that both processes are happening at the same time, determine:

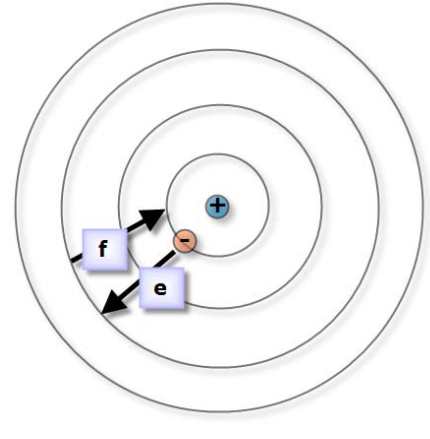
- the jumps in which the electron takes energy (0.25 POINTS)
- the jumps in which the electron releases energy (0.25 POINTS)
- draw all those jumps and the ionization energy in an energy diagram (0.25 POINTS)
- the placement of all emitted photons (UV, visible, IR regions) (0.25 POINTS)

1 POINT
ESTIMATED TIME: 10 min

50 % of hydrogen atoms undergo this process:



50 % of hydrogen atoms undergo this process:



(You can use this space to write your answer)

Identify (indicating the number) the following elements in the periodic table below

4

- a) the element with the symbol "O" (0.2 POINTS)
- b) the element with the symbol "F" (0.2 POINTS)
- c) the element with the symbol "Na" (0.2 POINTS)
- d) the element with the symbol "He" (0.2 POINTS)
- e) the element with the symbol "P" (0.2 POINTS)
- f) the element of the third period that forms a monpositive ion (0.25 POINTS)
- g) the element of the second period that forms a mononegative ion (0.25 POINTS)
- h) the element of the third period that forms a two positive ion (0.25 POINTS)
- i) the element of the second period that forms a two negative ion (0.25 POINTS)
- j) the element with the electron configuration $1s^2 \dots 3s^2 3p^3$ (0.25 POINTS)
- k) the element with the electron configuration $1s^2 \dots 4s^2$ (0.25 POINTS)

2.5 POINTS

ESTIMATED TIME: 10 min

1						2	
3	4						
11	12						
19	20						
		5	6	7	8	9	10
		13	14	15	16	17	18
						21	

(You can use this space to write your answer)

Identify (indicating the number) the elements that meet the properties that appear below

5

- a) the element from the second period that has $Z^*=4$ (0.2 POINTS)
- b) the element from the third period that has $Z^*=7$ (0.2 POINTS)
- c) the element from the first period that has $Z^*=1$ (0.2 POINTS)
- d) the element with the smallest atom from the second period (0.2 POINTS)
- e) the element with the largest atom from group 7A (0.2 POINTS)
- f) the element with the biggest metallic behavior from alkali metals (0.25 POINTS)
- g) the element with the highest value of electronegativity from the second period (the noble gases excluded) (0.25 POINTS)
- h) the element with the highest value of electronegativity from the group 16 (0.25 POINTS)
- i) the element from the first two groups which is a nonmetal (0.25 POINTS)
- j) the element of the table with the largest atom, explaining the reasons (0.5 POINTS)

2.5 POINTS

ESTIMATED TIME: 10 min

1						2	
3	4						
11	12						
19	20						
		5	6	7	8	9	10
		13	14	15	16	17	18
						21	

(You can use this space to write your answer)