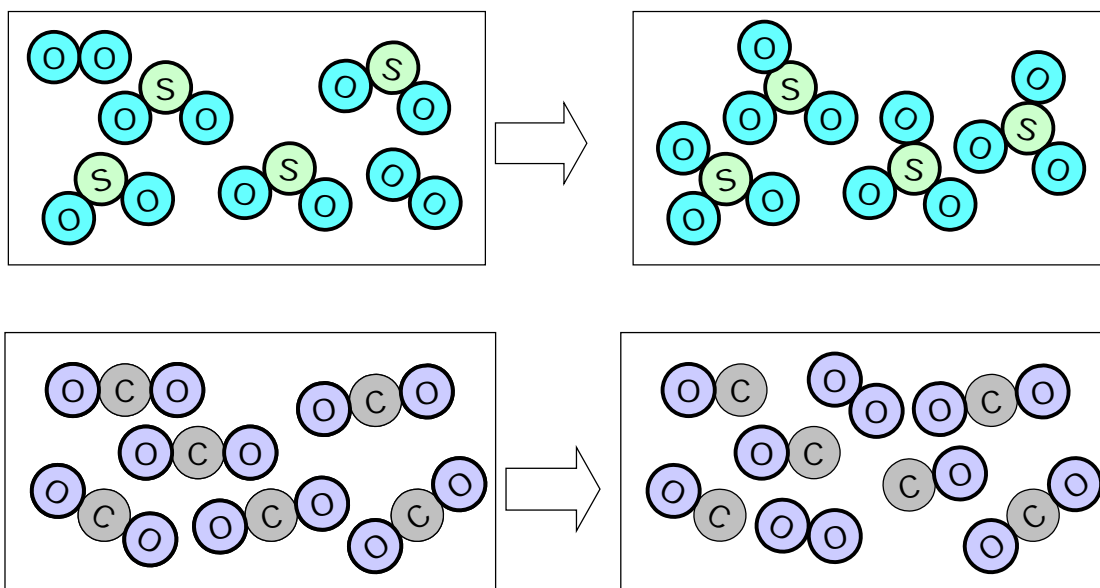


Mock exam
"The Atomic Theory & The Periodic Table"

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



2 Write the missing information about atoms / ions

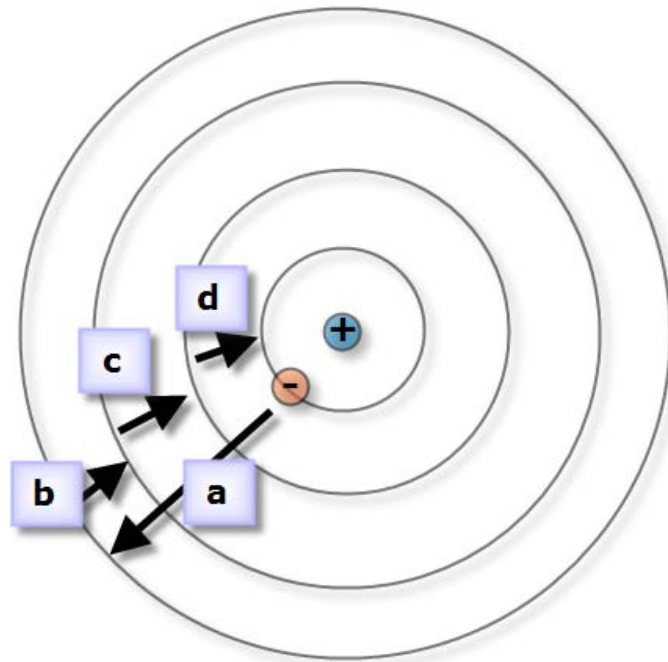
NOTE: The symbols are not real
2.5 POINTS (1 POINT for the NUMBERS, 1 POINT for the ORBITAL DIAGRAMS and 0.5 POINTS for LEWIS)
ESTIMATED TIME: 5 min

Atom or ion	A	Z	# of			Electron Configuration	
			p ⁺	n ⁰	e ⁻	Orbital diagram	Lewis
${}_{7}^{14}\text{A}$						<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> </div>	
${}_{11}^{23}\text{B}$						<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> </div>	
${}_{7}^{\square}\text{A}^{3-}$				7		<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> </div>	
${}_{12}^{25}\text{C}^{\square}$					10	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="border: 1px solid black; width: 40px; height: 20px; display: flex; justify-content: space-around; align-items: center;"> </div> </div>	

3 Look at the graphic below (this represents a hydrogen atom) and determine:

- the jumps in which the electron takes energy (0.25 POINTS)
- the jumps in which the electron releases energy (0.25 POINTS)
- the placement of the emitted photons (UV, visible, IR regions) (0.5 POINTS)

1 POINT
ESTIMATED TIME: 5 min



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

4

- the element with the symbol "K" (0.2 POINTS)
- the element with the symbol "Cl" (0.2 POINTS)
- the element with the symbol "H" (0.2 POINTS)
- the element with the symbol "O" (0.2 POINTS)
- the element with the symbol "N" (0.2 POINTS)
- the element of the second period that forms a monovalent ion (0.25 POINTS)
- the element of the fourth period that forms a monovalent ion (0.25 POINTS)
- the element of the third period that forms a two positive ion (0.25 POINTS)
- the element of the third period that forms a two negative ion (0.25 POINTS)
- the element with the electron configuration $1s^2 \dots 2s^2 2p^4$ (0.25 POINTS)
- the element with the electron configuration $1s^2 \dots 2s^2 2p^6$ (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	

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

5

- the element from the second period that has $Z^*=2$ (0.2 POINTS)
- the element from the first period that has $Z^*=2$ (0.2 POINTS)
- the element from the first period that has $Z^*=1$ (0.2 POINTS)
- the element from the third period that has $Z^*=7$ (0.2 POINTS)
- the element from the second period that has $Z^*=5$ (0.2 POINTS)
- the element with the smallest atom from the second period (0.25 POINTS)
- the element with the largest atom from group 5A (0.25 POINTS)
- the element with the biggest metallic behavior from alkaline earth metals (0.25 POINTS)
- the element with the highest value of electronegativity from the third period (the noble gases excluded) (0.25 POINTS)
- the element with the highest value of electronegativity from the group 14 (0.25 POINTS)
- the element from the first two groups which is a nonmetal (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	