Name:_____

/80 = %

**SCH 4C – Atomic Models Test**

1. Using the table, place each name that represents a scientist or group of scientists in chronological order (this means in order of oldest to most recent). Then in the second column, indicate the main points or discovery that goes with each model. Point form is preferred. Include in your answer two fundamental laws studied in this course and the main points in Dalton's Model.

Alchemists, Bohr, Dalton, Democritus, Empedocles, Rutherford, Thomson

| Name | Main Points or Discovery |
|---|---|
| | |
| | |
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| | |
| | |
| | |

/12

/12

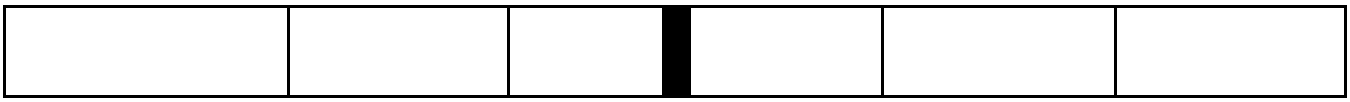
2. What observation lead Rutherford to believe that atoms were composed of mostly empty space?

/1

3. What observation lead Rutherford to believe that atoms contain a dense positively charged nucleus?

/1

4. Place labels in the following diagram to show a complete electromagnetic spectrum in order. Label in order from the least energetic type of radiation to the most energetic type of radiation.



/9

Indicate one use or danger for each of the seven main types of electromagnetic radiation.

| Type | Use or Danger |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

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/18

5. Draw lewis dot diagrams for each of the following atoms. Please use the periodic table to help you with this.

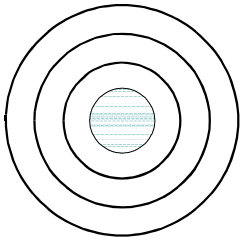
O P K

/6

Ar C Mg

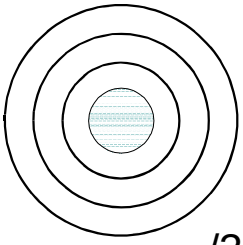
6. Add electrons to each of the following diagrams to represent Bohr-Rutherford diagrams for each of the following atoms or ions. Remember the 2, 8, 8, idea and if necessary the way of short-forming electrons that correspond to the elements from the Sc to Zn columns etc. Draw in extra shells if necessary. **Include nuclear charge.**

Cl



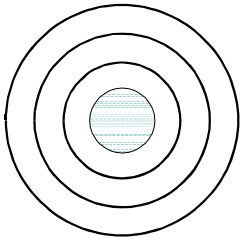
/3

K



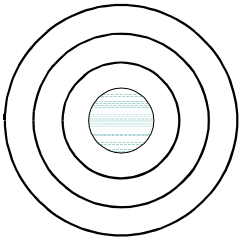
/3

$Al^{3+}$



/4

$S^{2-}$



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/14

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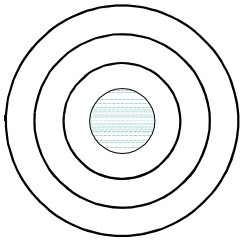
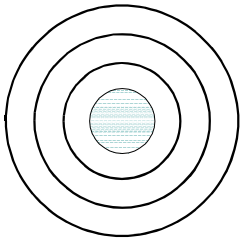
7. Show how the Bohr-Rutherford diagram changes as nitrogen follows the octet rule to become like the nearest noble gas. Be sure to include the resulting charges on the final diagram.

N

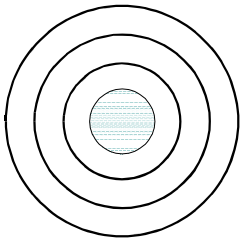


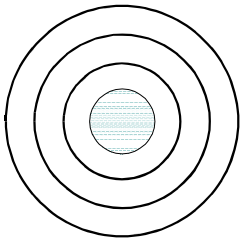


/5

8. Show how the Bohr-Rutherford diagram changes as magnesium follows the octet rule to become like the nearest noble gas. Be sure to include the resulting charges on the final diagrams

Mg





/5

9. Show the resulting ions and charges when each of the following elements follows the octet rule. The first one is done as an example

| Atom | Ion |
|---|---|
| $_{15}P$ | $P^{3-}$ |
| $_{56}Ba$ | |
| $_{5}B$ | |
| $_{9}F$ | |
| $_{54}Xe$ | |
| $_{31}Ga$ | |
| $_{14}Si$ | |
| $_{52}Te$ | |
| $_{11}Na$ | |
| $_{85}At$ | |

| Atom | Ion |
|---|---|
| $_{87}Fr$ | |
| $_{35}Br$ | |
| $_{55}Cs$ | |
| $_{16}S$ | |
| $_{7}N$ | |
| $_{8}O$ | |
| $_{6}C$ | |
| $_{2}He$ | |
| $_{82}Pb$ | |
| $_{38}Sr$ | |

/20

/30