

First Name: _____

Last Name: _____

L'04 - Formative Quiz - Rutherford Scattering and Emission Spectrum

Use the following information to answer Q1 and Q2:

	Cathode Ray Tube Evidence E	Rutherford Scattering Evidence F	Emission Spectrum Evidence G
	Model A Billiard Ball Dalton	Model B Plum Pudding J.S. Thomson	Model C Planetary Rutherford
			Model D Bohr Bohr
Common Names	Credited to	Evidence	
1 – Billiard Ball	5 – Bohr	8 – Alpha particle scattering	
2 – Bohr	6 – Rutherford	9 – Cathode ray experiments	
3 – Planetary	7 – Thomson	0 – Emission Spectrums	
4 – Plum Pudding			

Q1: Using the numbers above, what are the **Common Names** for Model A through Model D?

1
Model A

4
Model B

3
Model C

2
Model D

(Record your **four digit** answer in the Numerical Response boxes below)

1	4	3	2
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Q2: Using the numbers above, what evidence lead to the proposal of the next atomic model?

9
Evidence E

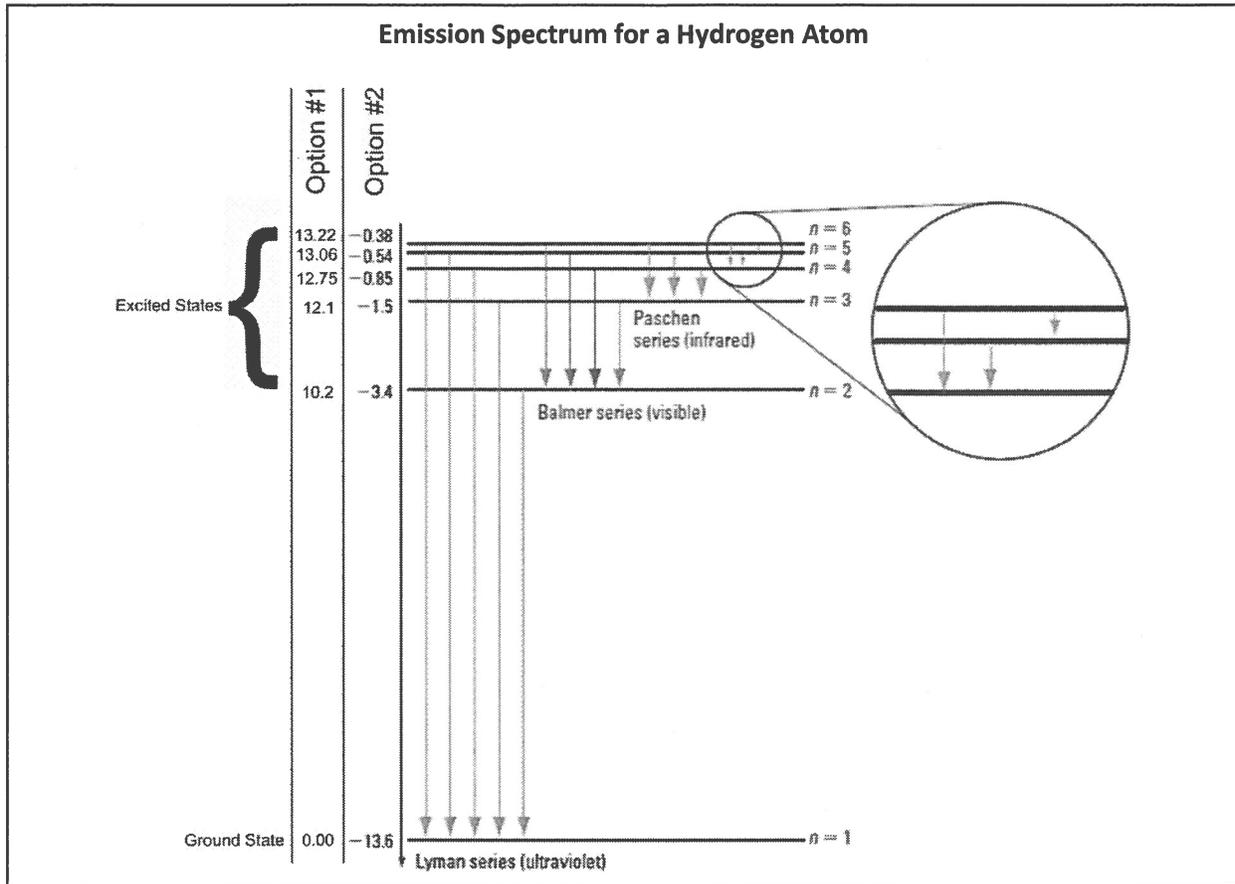
8
Evidence F

0
Evidence G

(Record your **three digit** answer in the Numerical Response boxes below)

9	8	0	
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Use the following information to answer Q3 and Q4:



Q3: An electron transitions from $n=3$ to $n=1$. What is the frequency of the photon emitted?

- a. 2.92×10^{15} Hz
- b. 3.65×10^{15} Hz
- c. 1.83×10^{34} Hz
- d. 2.28×10^{34} Hz

$$\Delta E = 12.1 \text{ eV}$$

$$E = hf$$

$$12.1 \text{ eV} = (4.14 \times 10^{-15} \text{ eVs})(f)$$

$$f = 2.92 \times 10^{15} \text{ Hz}$$

Q4: How much energy is required to ionize a Hydrogen atom with a single electron in the ground state?

- a. 0.38 eV
- b. 10.2 eV
- c. 13.22 eV
- d. 13.60 eV

Can't be determined from the "Option #1" energy level diagram. In "Option #2" energy level diagram, the ground state represents an "energy well" where -13.6 eV means that +13.6 eV needs to be added to get the electron to a "free" 0.0 eV state, leaving the Hydrogen atom without an electron, or "ionized".

MARKING:

Beginning	0 - 1
Progressing	2
Competent	3
Exemplary	4