

1. A photon has an energy of  $4.00 \times 10^{-19}$  J. Determine each of the following.

a. the frequency of the radiation.

b. the wavelength of the radiation

2. A photon of light has a wavelength of  $3.20 \times 10^5$  m. Determine each of the following.

a. the frequency of the radiation.

b. the energy of the photon.

3. High frequency = **short/long** (circle one) wavelength = **low/high** (circle one) energy

Using the following data:

	Compound	Color emitted when heated
A	Barium Nitrate	Yellow
B	Potassium Nitrate	Violet
C	Calcium Nitrate	Orange
D	Copper (II)Sulfate	Green
E	Lithium Carbonate	Red

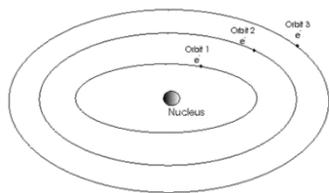
4. Which compound produces the longest wavelength?

5. Which compound produces the highest energy?

6. Which compound produces the lowest frequency?

7. Using the image to the left explain why copper

emits green light.



8. Describe the following terms, provide examples when applicable.

a. photon

b. radioactivity

c. nuclear symbol notation

d. hyphen notation

9. Fill in the table

Radiation Type	Mass	Greek Symbol	Identity	Shielding
ALPHA				
BETA				
GAMMA				

11. Identify the strongest type of radiation that can be blocked by each material (beta particles, gamma rays, or alpha particles)

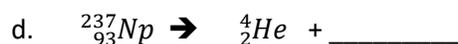
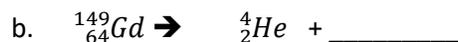
a) a piece of paper \_\_\_\_\_ b) a sheet of aluminum \_\_\_\_\_ c) a piece of lead \_\_\_\_\_

12. Write the equations for the following processes:

a. The alpha decay of iridium-174

b. The beta decay of platinum-199

13. Complete the following reactions:



14. Actinium-226 has a half-life of 29 hours. If 100 mg of actinium-226 disintegrates over a period of 58 hours, how many mg of actinium-226 will remain?

15. The half-life of isotope X is 2.0 years. How many years would it take for a 4.0 mg sample of X to decay and have only 0.50 mg of it remain?

16. Three grams of Bismuth-218 decay to 0.375 grams in one hour. What is the half-life of this isotope?