ASSIGNMENT-INVESTIGATION

**PHOTO ELECTRIC EFFECT**

* When light shines on a metal, electrons can be ejected from the surface of the metal in a phenomenon known as the photoelectric effect. [1]
* This process is also often referred to as photoemission, and the electrons that are ejected from the metal are called photoelectrons.
* In terms of their behavior and their properties, photoelectrons are no different from other electrons. The prefix, photo-, simply tells us that the electrons have been ejected from a metal surface by incident light.

**BREMSSTRAHLUNG RADIATION**

* Bremsstrahlung is a German term that means "braking rays”. [2]
* It is an important phenomenon in the generation of X-rays.
* In the Bremsstrahlung process, a high speed electron traveling in a material is slowed or completely stopped by the forces of any atom it encounters.
* As a high speed electron approaches an atom, it will interact with the negative force from the electrons of the atom, and it may be slowed or completely stopped.
* If the electron is slowed down, it will exit the material with less energy. The law of conservation of energy tells us that this energy cannot be lost and must be absorbed by the atom or converted to another form of energy.
* The energy used to slow the electron is excessive to the atom and the energy will be radiated as x-radiation of equal energy.
* If the electron is completely stopped by the strong positive force of the nucleus, the radiated x-ray energy will have an energy equal to the total kinetic energy of the electron.
* This type of action occurs with very large and heavy nuclei materials. The new x-rays and liberated electrons will interact with matter in a similar fashion to produce more radiation at lower energy levels until finally all that is left is a mass of long wavelength electromagnetic wave forms that fall outside the x-ray spectrum.

**DIFFERENCE BETWEEN XRAYS AND GAMMA RAYS** [3]

* PRODUCTION

1. **X-rays** are produced when energetic electrons lose energy.
2. **Gamma rays** are produced by radioactive nuclei.

* WAVELENGTH

1. **X-rays** have a larger wavelength (and hence a smaller frequency) than **gamma**.

* ENERGY

1. **X-ray** photons carry more energy than **gamma** photons. Therefore, gamma rays have a stronger ionizing ability.

* PENETRATION

1. **X-rays** have less penetrating power compared to **gamma** rays.

**DIFFRENCE BETWEEN SOFT AND HARD X-RAYS**

* ***Hard* x-rays are the highest energy x-rays, while the lower energy x-rays are referred to as *soft* x-rays.**
* **The distinction between hard and soft x-rays is not well defined.**
* **Hard x-rays are typically those with energies greater than around 10 keV.**
* **Soft x-rays are those with energies in between 1 keV to 10 keV.**
* **More relevant to the distinction are the instruments required to observe them and the physical conditions under which the x-rays are produced.**
* **Hard x-rays are more damaging to human body in comparison with Soft x-rays.**
* **Hard x-rays damage Huma body when their energy level raises above 35keV.**

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