

## Chapter 27

Upon which does the energy of a photon depend?

- A) Mass
- B) Amplitude
- C) Polarization
- D) Wavelength
- E) Phase Relationships

Which of the following is an accurate statement.  
(UV Light has a shorter wavelength than IR light)

- A) In vacuum ultraviolet photons travel faster than infrared photons.
- B) Ultraviolet light has more energy than infrared light.
- C) An ultraviolet photon has more energy than an infrared photon.
- D) Photons do not have energy.

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A beam of red light and a beam of violet light each deliver the same power on a surface. For which beam is the number of photons hitting the surface per second the greatest? (The wavelength of violet light is shorter than red light).

- A) the red beam
- B) the violet beam
- C) the number of photons per second is the same for both beams
- D) This cannot be answered without knowing the intensity of the light
- E) This cannot be answered without knowing the frequency of the light.

A metal surface is illuminated with blue light and electrons are ejected at a given rate each with a certain amount of energy. If the intensity of the blue light is increased, electrons are ejected

- A) at the same rate, but with more energy per electron
- B) at the same rate, but with less energy per electron
- C) at an increased rate with no change in energy per electron
- D) at a reduced rate with no change in energy per electron
- E) at an increased rate with an increased energy per electron

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Light with a wavelength of 400 nm is incident on a metal surface. It is then turned off and light with a wavelength of 300 nm is incident on the same surface with the same intensity. Compared to the 400 nm light, the 300 nm light will have

- A) more electrons emitted in a given time interval
- B) electrons with more kinetic energy emitted.
- C) both (A) and (B) are false.
- D) both (A) and (B) are true.

In the setup at the right, photons with an energy of 6 eV are fired on a metal. When the stopping potential is turned up to 2 V, no current flows. If the wavelength of the photons is doubled, the electrons emitted will have a maximum kinetic energy of

- A) 1 eV.
- B) 8 eV.
- C) 10 eV.
- D) 20 eV
- E) No electrons will be emitted.

