

### Answer on Question # 69998, Chemistry / Inorganic Chemistry

Calculate the wavelength of the light required to eject a photoelectron from caesium metal with a kinetic energy of  $2.0 \times 10^{-19}$  J (v for caesium is  $4.55 \times 10^{14}$  Hz)?

#### Solution:

1. Calculate the general energy:

$$K_{max} = h \times f - \Phi_0$$
$$K_{max} = 6,63 \times 10^{-34} \times 4.55 \times 10^{14} - 2.0 \times 10^{-19} = 1.0 \times 10^{-19} \text{ (J)}$$

2. Calculate the wavelength:

$$K_{max} = \frac{h \times c}{\lambda} \Rightarrow \lambda = \frac{h \times c}{K_{max}}$$
$$\lambda = \frac{6,63 \times 10^{-34} \times 3 \times 10^8}{1.0 \times 10^{-19}} = 198.9 \times 10^{-8} \text{ (m)}$$

**Answer:**  $198.9 \times 10^{-8} \text{ (m)}$ .