

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS  
DEPARTMENT OF PHYSICS

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Instructor: Dr. A. Mekki

Physics 102 – Quiz#2  
Chapter 2b

Name: \_\_\_\_\_ Id#: \_\_\_\_\_

(a) The work function of copper is 4.70 eV. What should be the wavelength of the incident electromagnetic radiation so that the photoelectrons emitted from the sodium will have a maximum kinetic energy of 10 eV?

We know that  $K_{\max} = hf - \phi = h \frac{c}{\lambda} - \phi$

$$10 \text{ eV} = \frac{12400 \text{ eV} \cdot \text{\AA}}{\lambda} - 4.70$$

$$14.70 = \frac{12400}{\lambda} \Rightarrow \lambda = \boxed{844 \text{ \AA}} = \boxed{84.4 \text{ nm}}$$

(b) Calculate the cut off wavelength and threshold frequency.

when  $f = f_0$   $K_{\max} = 0 \Rightarrow f_0 = \frac{\phi}{h} = \boxed{1.1 \times 10^{15} \text{ Hz}}$

$$\lambda_0 = \frac{c}{f_0} = \boxed{264 \text{ nm}}$$